

APPLIED CLINICAL PSYCHOLOGY

*Series Editors: Alan S. Bellack, and Michel Hersen*

*Handbook of  
Assessment  
in Childhood  
Psychopathology*

*Applied Issues in Differential  
Diagnosis and Treatment Evaluation*

*Edited by Cynthia L. Frame  
and Johnny L. Matson*

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Series Editors:

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*Handbook of  
Assessment in  
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Diagnosis and Treatment Evaluation*

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This book is dedicated to our  
parents and families, whose love and support  
have made all of our work easier.

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# Preface

One of the most important practical problems in child psychology and psychiatry is the differential diagnosis of emotional disorders. Until recently, the general mode of assessment had been to apply to children the characteristics of psychopathology that were evident in adults. In addition, there had been few assessment tools available for use with children aside from modified versions of adult instruments. Understandably, this approach was controversial, and dissatisfaction with it led to the more recent knowledge that adult and child problems may be manifested quite differently. The third edition of the *Diagnostic and Statistical Manual of Mental Disorders* takes these factors into account much more extensively than previous editions. Furthermore, a great deal of research on methodology in child assessment procedures has emerged recently. Yet, in spite of these advances, practicing clinicians are still frequently at a loss in moving from the characteristics of the disturbed child before them to the final assignment of a psychiatric diagnosis. The focus of this book is to outline the various methods of viewing and categorizing the wide range childhood psychopathology, with special emphasis on the end product of making a differential diagnosis.

Our goal was to make this book unique in several ways. First, we attempted to cover a wider range of disorders than is typical in currently available handbooks. Thus, this book includes chapters not only on such commonly seen problems as attention deficit or conduct disorders, but also on rarer or less frequently discussed psychopathologies, such as learning disabilities, mental retardation, and psychophysiological problems.

Second, for each of the various types of psychological problems, current research and clinical lore concerning early or common indicators of that disorder are discussed. Too often in the past, assessment handbooks have been designed for use *after* a diagnosis has been made, rather than to help the clinician consider various disorders from the outset, as this book attempts to do. For example, a child's excessive daydreaming in the classroom is a frequent presenting problem in clinical settings. Although one might initially suspect the presence of an attention deficit disorder, such behavior may also be an early indicator of depression, learning disability, or mental retardation. The reader of this book should find a great deal of information to permit consideration of several diagnoses, given a specific presenting symptom.

Third, an up-to-date review of the latest assessment methods and their psychometric properties is presented, including descriptions of their use and addresses for obtaining copies of some of the unpublished forms. Where appropriate, cutoff scores and normative information are also provided to aid the reader in considering the significance of a child's score on a particular measure.

Fourth, the relationship between each type of disorder and other emotional problems is considered in detail in two ways. In order that the reader may be

alerted to related problems requiring further assessment, types of psychopathologies that tend to co-occur are identified. Furthermore, the differential diagnosis of each disorder is explored, with suggested guidelines for ruling out competing diagnoses.

Considerable attention is also given to the problems inherent in conducting a psychological assessment with children who have special handicaps. Various chapters elaborate on the specific modifications that may be necessary when working with children who are medically, physically, visually, cognitively, or hearing-impaired. Furthermore, adjustment problems that may be uniquely related to these disabilities are pointed out.

Finally, we have sought to maintain a balance between the basic and applied orientations, presenting a synthesis of the available knowledge in the area of the assessment and diagnosis of childhood psychopathology. For instance, we have included a chapter on clinical interviewing and report writing to aid the practicing clinician, whereas the chapters on the history of assessment and on theoretical issues may be of greater interest to the academic psychopathologist. Other chapters, covering diagnostic systems, basic assessment methodologies, and the disorders themselves, should be of use to all.

In summary, we have attempted to compile a handbook of scholarly and practical information that can be readily used by practicing clinicians, researchers, and graduate students in the mental health professions. Because of the massive amount of material covered in this book, we wanted each chapter to be written so that it could stand alone, or so that it could be alternatively supplemented by the other chapters. This approach has necessitated a small amount of unavoidable redundancy across some chapters, a factor that we hope the readers of the entire volume will understand.

Finally, we would like to express our appreciation to Cecile Herrin and Kaye Moore for their aid in manuscript preparation, and to Alan Bellack, Michel Hersen, and Eliot Werner for having confidence in us and our project. Cynthia Frame's work was supported in part by the Institute for Behavioral Research, the Department of Psychology, and a Sarah Moss Fellowship, all of the University of Georgia.

Cynthia L. Frame  
Johnny L. Matson



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# I Basic Issues

# 1 *Historical Trends in the Recognition and Assessment of Childhood Psychopathology*

CYNTHIA L. FRAME AND JOHNNY L. MATSON

Surprisingly, the scientific study of childhood psychopathology is of relatively recent origin, primarily dating since the early 1900s. There seem to have been several important historical trends that resulted in a failure to recognize the importance of assessing, diagnosing, and treating mental disorders in children. One important factor was certainly the comparable lack of attention paid to the psychological problems of adults until the late 1800s. Thus, early views of children's psychological problems closely paralleled those of adult's mental disorders. These views of psychopathology through the ages will be described in more detail later. As will be discussed, the lack of any theoretical framework for investigating psychopathology greatly hindered progress.

Second, it was not recognized until recently that children were different from adults in their abilities, their needs, or other characteristics. As a result, the genesis of the study of child development in its own right will also be considered briefly in this chapter. Such work was influential in shaping our current thinking about normal versus abnormal behavior in children.

A third historical trend influencing the type of attention given to childhood problems involved the nature of the first successful psychological work concentrating specifically on children: the assessment of intellectual functioning. The resulting thrust toward intellectual assessment and achievement testing seemed to turn attention even further away from the study of other psychological problems of children.

Finally, in the first half of the twentieth century, the delineation and study of specific childhood psychopathologies was discouraged by the prevailing school of thought of American psychiatrists. That movement, led by Adolf Meyer, stressed the unimportance of diagnostic labels and classification systems for children or adults, concentrating instead on each individual's unique symptoms or ways of dealing with his or her environment. Most often, these behaviors were viewed from a psychoanalytic framework, in which children were



viewed differently from adults only in that they had not yet had the opportunity to pass through as many developmental states. As we will see, this thinking led to some erroneously held beliefs, such as the impossibility of childhood depression. On the other hand, learning theorists at the time also did little to further the study of child psychopathology as a separate field by their claims that behavior in animals, children, and adults could all be explained by the same processes of operant or classical conditioning.

Obviously, however, the assessment of childhood psychopathology has begun to bloom, despite these discouraging historical trends. Professionals from the areas of psychoanalysis, learning theory, criminal justice, and child development, to name a few, have contributed their ideas and their energies toward developing special assessment and treatment techniques for children, as well as toward establishing childhood psychopathology as a topic worthy of scientific theorizing and empirical investigation. The shaky beginnings and the difficult course of the field will be considered now in greater detail.

## EARLY VIEWS OF PSYCHOPATHOLOGY

Although the systematic study of psychopathology is a rather recent phenomenon, many emotional disorders, especially in their severe forms, have been identified for some time. For example, in the Old Testament of the Bible, numerous references are made to emotional disorders such as Saul's severe bouts of depression. Alexander the Great evidently exhibited periods of "great excitement" (probably what we would today call mania), and Abraham Lincoln was reportedly depressed a good deal of the time. Of course, it is necessary for us to use rather tentative labels here, as the information we have is too sketchy to allow precise diagnoses. Nonetheless, it is obvious that, even before modern classification systems were developed for psychopathology, mental disorders were often identifiable and of no small concern to the families and friends of the afflicted individuals.

Probably, the most common view of psychopathology since the fifth century or before has been that of demonology. Persons with mental illnesses were typically considered possessed by evil spirits, which at one time were thought to be personified by the dreaded goddesses Mania and Lyssa. The habit of wandering around and the proneness to violent outbursts were frequently considered signs of a mental disorder. In his *Histories*, Herodotus reported that kings Cambyses of Persia and Cleomenes I of Sparta suffered from problems of this sort. Given that these persons were generally believed to be possessed by evil spirits, treatment possibilities were limited and were aimed at exorcism of the devil or banishment of the individual. Plato described such persons' being exiled to rid the city of their presence.

Some scholars hold that the witch hunts that occurred in Europe and in the early American colonial days results from such commonly held beliefs that mentally ill people were possessed by the devil (Zilboorg & Henry, 1941). Other experts have come to believe, however, that the witch hunts were politically

motivated framings of mentally healthy individuals; these scholars claim that those with mental disorders were rarely accused of, or tried for, crimes (Neugebauer, 1979). Instead, they were ignored, exiled, or placed under the care of the clergy.

In early times, no mental hospitals existed in Europe. With the decline of the occurrence of leprosy in the 15th century, many buildings previously used as leper colonies were left standing, and it soon became a standard practice to house mentally ill and/or mentally retarded people in these asylums. As might be expected, individuals were merely “warehoused” in these institutions, where they were given no treatment for their problems and little care. They were frequently tied, chained, or locked into dark rooms and were often fed quite poorly. Many died from malnutrition or contagious diseases that spread through the asylums, and few ever improved or were released. It became fashionable for rich ladies to visit the asylums and to watch the patients as a form of entertainment. It was not until Philippe Pinel (1745–1826) revolutionized thinking about mental disorders in 1793 by unchaining patients and ordering them to be treated as fellow human beings that the concepts of benevolent care or actual treatment for the mentally ill came into vogue. Thus, before this time, it had been better for a person’s mental disorder to go unnoticed, as identification almost surely meant exile or institutionalization, misery, and early death.

Pinel’s emphasis on “moral treatment” led to better conditions for mental patients and finally spurred more systematic study of mental disorders when it became obvious that even the most relaxing and luxurious situations did not promote a decrease in the symptoms of some patients. A medical textbook that dealt with psychiatry was first published in 1602. Its author, Felix Platter, a Swiss physician, described 75 mental conditions. Over the next 200 years, the descriptions of emotional disorders became much more sophisticated. Johann Christian Heinroth (1773–1843) was one of the first psychiatrists to stress the unity of mind and body processes; it was he who coined the term *psychosomatic*. He attached particular importance to internal psychological conflicts.

About the same time, unfortunately, a Vienna-based physician set back the study of mental disorders through his attempt to assess them using what he thought were objective means. Franz Josef Gall (1758–1828) proposed that mental faculties and dispositions were innate and depended on the topical structure of a person’s brain. Gall attempted to assess the brain’s structure and the purportedly related personality characteristics by examining the shape and contour of a person’s head with his fingertips. It was eventually recognized that Gall’s ideas were wrong and his techniques virtually worthless, but even temporary support for these views had a detrimental effect on the study of mental disorders.

In the second half of the 19th century, there occurred two major advances in the field of psychopathology. First, it was discovered that organic factors such as vitamin deficiency, brain inflammation, or brain damage, and infections such as syphilis could cause mental symptoms, including delusions, hallucinations, mood swings, and memory loss. This discovery laid the groundwork for the development of a medical model of mental disorders.

Second, a young psychiatrist named Émile Kraepelin (1856–1926) made an attempt to identify psychopathological conditions via the systematic documentation of various characteristics. Kraepelin carefully noted the etiology, symptomatology, course, and outcome of each of his patients' conditions and tried to group together those that appeared to have similar patterns. So detailed was his work that the ninth edition of his handbook of psychiatry exceeded 2,500 pages in length. His major contribution, however, consisted of identifying and separating the affective disorders from schizophrenia, and of emphasizing the utility of the careful description and classification of mental problems.

The first official classification of mental disorders used in this country, however, was that of the 1840 U.S. Census. It contained only one relevant category: "emotional disorders." By the 1880 Census, mental disorders had been divided into seven categories, including mania, melancholia, monomania, paresis, dementia, disposomania, and epilepsy, paralleling the increasingly sophisticated view of psychopathology as consisting of various discrete disorders. This emphasis on diagnostic assessment and classification was shortly to decrease rapidly in America, however, and was not to reemerge until the 1950s. We will discuss the decline in the use of psychiatric diagnosis in a later section. First, we must consider two other developments in the early 1900s that influenced the scientific study of psychopathology: the introduction of theories of behavior by Freud and his colleagues, on one front, and by the learning theorists, on the other.

A major factor hindering the pursuit of knowledge in the field of abnormal behavior had been a lack of theory. Sigmund Freud (1856–1939) was one of the first mental health professionals to suggest a rather comprehensive theory of the development of abnormal behavior. Although a thorough description of his work is beyond the scope of this chapter, we will underscore those elements that were most relevant to the later growth of childhood assessment procedures. Probably most important about Freudian theory was its emphasis on symptomatic behavior as indicative of some underlying psychological turmoil. Thus, Freud proposed that it was not enough to describe symptoms, but that one must try to understand the inner workings of the mind and the nature of perhaps unconscious psychological conflicts. Freud went on to suggest that there existed a series of developmental stages through which individuals generally passed during childhood. It was possible for an individual to become fixed at, or to regress to, one of these stages, and certain symptoms were predicted to develop, according to the particular stage. In turn, almost all symptoms were thought to result from conflicts surrounding the various stages. The goal of treatment, then, was to help the person uncover, understand, and accept those conflictual issues. Freud's theories attracted many followers, and soon psychoanalytic techniques were in widespread use. This model of psychopathology eventually led first to the development of projective assessment devices and then to the desire for theory testing (Maher & Maher, 1979). Meanwhile, there developed among psychologists an opposing theoretical viewpoint.

Led by John B. Watson (1878–1958), a group of learning theorists proposed that the principles of operant and classical conditioning could be used to explain

the acquisition and maintenance of abnormal behaviors. Again, this line of thinking contributed to the scientific study of abnormal behavior through theory testing. Unlike Freudian theory, however, learning theory stressed the description of symptomatic behaviors along with their antecedents and consequences. Learning theory was eventually expanded by individuals such as Neal Miller, John Dollard, and Albert Bandura to include the roles of social, or observational, learning and cognitive attributions to explain the existence of psychological problems. Among the psychoanalytic, learning, and organic theories, scientists now had a gold mine of theoretical propositions from which to draw in their work, and psychopathology became an accepted field of study.

But what are the implications of these developments for the study of childhood mental disorders? As mentioned previously, problems in childhood were largely overlooked. It was evidently very rare for mentally disturbed children to be institutionalized before or during the time of moral treatment. Yet, we know that problems were sometimes recognized in childhood. For instance, Glicklich (1951) described some treatments for enuresis that were suggested in a medical text from 1550 B.C. One remedy consisted of giving the child a mixture of juniper berries, cyprus, and beer. Other treatments included burning the crop of a cock, placing it in tepid water, and giving it to the child to drink; shaving a hare's scrotum and placing it in wine for the child to drink; and giving the child toasted seed of wild rue to drink every third day. The fact that such detail was given to treatment recommendations suggests that enuresis was a problem of some concern at the time. Furthermore, literature from the 1600s acknowledges "fits" and "distemper" in a male child, but as with adult disorders, the symptoms were attributed to possession by evil spirits (Wenar, 1982).

In the nineteenth century, some workers began to suspect that childhood psychopathology might differ from that of adults, but many of their conclusions were incorrect. In 1812, Benjamin Rush (1745–1813), commonly considered the first American psychiatrist, suggested that children were less likely than adults to suffer from mental illness because their brains were too unstable to retain whatever mental phenomena caused insanity (Rubenstein, 1948). Some 50 years later, the first classification of childhood psychological disorders was published. Unfortunately, it contained only very broad descriptions of severe problems that might occur in childhood, and much of the text was erroneous. For instance, it described the commonly held notion that masturbation occurred only in children and was responsible for a variety of psychiatric and physiological symptoms (Wenar, 1982).

The psychoanalytic movement that was to follow was important to the study of childhood psychopathology in several ways. First, the description of the psychosexual stages suggested which types of "developmental delays" might occur in children with various symptoms. For instance, nail biting and thumb sucking were considered most likely to be signs of a failure to pass through the oral stage of development. In the emphasis on underlying conflict rather than overt behavior, the primary symptoms of many children were left unattended while they were assessed by means of projective devices and were treated for psychological conflicts via "talk therapy." After professionals such as

Anna Freud and Melanie Klein suggested that special techniques were needed to uncover children's unconscious conflicts and fantasies, assessment tools such as play therapy and projective instruments that used animals or cartoons as stimuli were developed. Finally, psychoanalytic theory suggested that there were some disorders that children were not yet psychosexually developed enough to experience—depression, for example. Thus, although beginning as a framework that had as a major assumption a lack of differences between child and adult mental problems, psychoanalytic theory did turn our attention to the possibility of children's having special assessment needs and showing unique patterns of psychopathology.

Likewise, learning theory demonstrated that children could have fears and other problems that adults experienced, and that it was often (hypothetically) easier to change children's problem behaviors because one could control environmental contingencies more than with adults. Watson's studies in which he conditioned fear in Little Albert and extinguished it in Little Peter were early demonstrations of such ideas. When learning theory was expanded to include social learning, it also suggested that imitation was a possible means of acquiring maladaptive behaviors and placed greater emphasis on the necessity to evaluate the actions of a child's parents, teachers, and peers in addition to the child.

## THE CHILD DEVELOPMENT MOVEMENT

As the reader has probably already discerned, the lack of attention to childhood psychopathology has a strong historical precedent in the lack of attention to childhood in general. Throughout much of the course of history, children were viewed as nothing more than miniature adults. In fact, Aries (1962) stated that, before the 17th century, "childhood" was not even recognized. Children were dressed as adults, and there were no special play activities, games, or literature. It has been postulated by many that this state of affairs may have been due in large part to high mortality rates and the struggle for mere subsistence. For example, in the 18th century, children born in London had only a 50% chance of reaching their fifth birthday. The factories of the period required a considerable amount of cheap labor, which was often provided by very small children. It was necessary for small children to work, or families would starve. Typical of thinking at the time was the considerable opposition that occurred to a bill that prohibited children 9–13 years old from working more than 48 hours a week and prohibiting children 13–18 years old from working more than 68 hours a week.

Another driving force was the commonly held belief that children were born into sin and needed to keep busy to stay out of trouble. Because children were thought to be basically sinful, religious teachings also frequently endorsed harsh physical punishment to keep the devil away. Thus, children, while being treated as small adults in other ways, had no rights and were considered the property of their parents, to be whipped or even killed if deemed necessary. There was no

recognition that children might not be cognitively capable of making moral judgments, because no knowledge was available regarding the development of children's skills, abilities, and cognition. In fact, relatively little was known even about children's physical growth.

In the United States, the study of children and their development came into its own with the initiation of the child development institutes. According to Sears (1975), Cora Bussey Hillis, a housewife in Iowa, realized one day in 1906 that there was more scientific study of livestock and agricultural products than there was of children. She suggested that child development should be a topic for (1) research aimed at the understanding of normal developmental processes and (2) dissemination of this knowledge to the general public. Some 10 years later, the Iowa Child Welfare Research Station was founded. It became a center for the study of physiological and mental growth. Other states followed suit, and there were soon other child development centers in Ohio, New York, Connecticut, Minnesota, and California, where experts began studying such diverse areas as the social, physical, cognitive, intellectual, and behavioral development of children. Although this work was somewhat slowed by the impact of World War II, federal funding permitted the continued growth of knowledge generated by these centers. They have provided us with vast amounts of information about normal child development, permitting a better understanding of abnormal behavior at various ages.

Around the turn of the century, the efforts of two other individuals helped to pioneer the mental health movement for children. In Chicago, William Healy founded the Institute for Juvenile Research in 1909 to learn more about the causes and prevention of juvenile delinquency. Healy stressed the role that cultural and social background may have had in the development of the wayward behavior of these court-referred children. He engaged a multidisciplinary team of professionals including psychologists, psychiatrists, and social workers to assess and aid these troubled youngsters. Healy's work was predated by several years by Lightner Witmer, who had founded a clinic at the University of Pennsylvania dedicated solely to the assessment, treatment, and study of childhood disorders. In fact, Witmer coined the term *clinical psychology* and was influential in spreading the notion that mental illness and its assessment and treatment were appropriate topics for psychologists to pursue. Largely because of the work of Witmer and Healy, awareness of the need for psychological services designed for children grew to such a height that, in 1921, governmental funding was provided for the development and support of child guidance clinics across the country, an idea that has persisted into the present. In this way, quite a bit of progress had been made by 1930 toward acknowledging and pursuing the unique nature of mental illness in children.

Unfortunately, however, although mental health professionals were now interested in the psychological problems of children, they were basically uncertain about *how* to assess and treat behavior problems in children, with one exception. The exception lay in the area of intellectual and educational assessment.

## THE DEVELOPMENT OF INTELLIGENCE TESTS

Around the turn of the century, a French psychologist named Alfred Binet attempted to develop a test on the basis of which a child's school success could be predicted. Consisting of a collection of verbal and motor tasks that were thought to represent a sampling of the child's comprehension of his or her environment, the test was soon adopted by Henry Goddard to assess his handicapped youth. It was then adapted by Lewis Terman at Sanford University in 1916. The test was scored in such a manner that a child's performance was compared to that of others of various ages, on the basis of which a mental age score was obtained. Terman preferred to divide that score by the child's chronological age to yield a score called the *intelligence quotient*, or IQ. It was discovered that the IQ score was, in fact, very helpful in identifying those children who would have problems learning in the regular classroom.

This turn of events had several major influences on the growth of the child assessment field. First, the fact that the effort proved to be a successful one led to the widespread use of intelligence tests in Europe and the United States. The tests became a tool for identifying those children who might require special classroom placements or academic assistance. Second, this work set the tone for much of the child research for some time to come. Investigators refined intelligence tests, developed new ones, and, beginning to differentiate "intelligence" from "school learning," developed achievement tests. Extensive normative and developmental data were collected and made available to examiners for comparison with the results of each child's performance. Desirable psychometric properties were defined, and vast amounts of time and effort went into ensuring the validity and reliability of the various tests. Designing and administering tests of various sorts almost became a national pastime.

Tests were eventually developed for personality and psychopathology assessment, as well. What had worked well for the assessment of children's intelligence, however, did not seem to work as well for the assessment of children's psychological difficulties. It was difficult to establish the validity and reliability of projective tests, and those professionals assessing psychological problems from a learning perspective did not recognize the need for normative data, preferring to document each child's reinforcement history. In this way, a movement that first called attention to the special needs and abilities of children did not serve them especially well in the long run. Arguments surrounding testing eventually combined with attitudes against diagnostic classification to delay real growth in the field of assessment of child psychopathology until the 1960s.

## THE TREND AGAINST DIAGNOSIS

As alluded to earlier, the influence of Adolf Meyer in American psychiatry was obvious in the decline of interest in diagnostic assessment and classification from the early 1900s until the 1950s. The prevailing emphasis was on an individual's idiosyncratic conflicts and coping styles, and diagnosis was viewed as

the "labeling" of individuals, with possible detrimental results such as social stigma and self-fulfilling prophecies (Sarbin, 1967). The psychoanalysts felt no need for such labels, nor did the "commonsense" psychiatrists such as Meyer, who emphasized the role of environment in the development of psychological difficulties. And, of course, learning theorists also viewed each individual's learning history as unique and denied the need for diagnostic classification. Although such views were common well into the 1970s, an increasing number of psychopathology researchers began to argue for the usefulness of psychiatric diagnosis.

The purposes of classification were elucidated by those in the philosophy of science and taken up by psychopathology researchers. The most important reason for using a diagnostic system, they claimed, was to define the problem under study. If a diagnosis provided a common vocabulary, then professionals could communicate clearly and could better investigate the etiologies of differing symptom patterns. Also, an accurate diagnosis should be an aid in predicting response to various treatments. With the advent of antipsychotic, antidepressant, and antimanic medications in the 1950s and 1960s, this proved to be the case. The American Psychiatric Association's third edition of its *Diagnostic and Statistical Manual of Mental Disorders* (1980) represents the culmination of an increased awareness of the utility of psychiatric diagnosis and an attempt to make such classification reliable and valid. The new diagnostic movement is in large part responsible for increasing our knowledge of childhood disorders and, concurrently, our efforts to assess them. Professionals from many orientations have come to the realization that we must identify and investigate the parameters of mental illness in childhood before we can develop more successful treatments.

This book represents a sampling of our current knowledge and recent methodological advances in the assessment and diagnosis of childhood psychopathology. Although the reader may occasionally become frustrated by the dearth of assessment instruments available for some of the disorders, this frustration must be tempered by the knowledge that most of our important gains have been achieved only in the last few decades. With continued concerted effort, we may be as good at assessing childhood psychopathology in the twenty-first century as we now are at assessing intellectual functioning and academic ability.

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## 2      *Theoretical Approaches to Assessment and Treatment*

EDWARD A. KONARSKI, JR., AND JEAN SPRUILL

Theories of psychopathology are collections of assumptions and facts relevant to behavior, as well as descriptions of how they interact to explain the development and persistence of abnormal behavior. Such theories have proved invaluable to both researchers and practitioners in their efforts to understand and alleviate human suffering. In fact, it can accurately be said that any attempt to understand, assess, or treat abnormal behavior presupposes some theory or model of psychopathology. At a general level, professionals' theory of psychopathology acts as a guide to direct their performance in achieving their particular goals. In this regard, the terms *approach* and *orientation* well describe this role of theory.

Although many theories of abnormal behavior and treatment have been delineated (Rosenhan & Seligman, 1984; Weckowicz, 1984), and many theories of specific abnormalities have been proposed, this chapter outlines four general approaches that describe the orientations most frequently encountered in the child psychopathology area. These are the biological, behavioral, humanistic, and psychodynamic approaches. They will be reviewed by examining the nature of normal and abnormal functioning, as well as assessment and treatment issues as outlined by each approach. Additionally, an evaluation of the contributions of each approach will be presented.

### BIOLOGICAL APPROACH

The biological approach to understanding, assessing, and treating psychopathology takes a somatic, or organic, orientation that is typically referred to as the *medical model of behavior*. It was the first model of psychopathology that took a scientific approach to this problem, and it has dominated the thinking of medical professionals who deal with abnormal behavioral functioning. It has also influenced psychological approaches to psychopathology such as the psychodynamic model. In recent times, one can see a merging of psychological approaches with

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the medical model in the appearance of such fields as health and medical psychology and the development of such treatments as biofeedback. Furthermore, the biological approach has contributed significantly to the vocabulary of the field (e.g., *mental illness* and *symptoms*). Familiarity with this approach is therefore highly recommended to professionals of all orientations.

We believe it is valid to extend the view of Crocker (1980) regarding the different biomedical approaches to mental retardation to the entire field of psychopathology. In summary, biomedical approaches to psychopathology include (1) research on potential, specific physiological causes of psychopathology; (2) clinical treatment of these disorders; (3) provision of primary health care for affected persons; and (4) aid in the implementation of preventive programs (Crocker, 1980). Additionally, the biomedical approach includes specific methodologies for the assessment of mental illness and its underlying physiological causes.

### *The Nature of Normal and Abnormal Functioning*

The basic assumption of the biological approach to behavior is that there is a direct correspondence between physical functioning and structures—the brain in particular—and psychological functioning. Healthy physical functioning and structures result in normal behavior, whereas unhealthy physical functioning or structures result in abnormal behavior. The biological approach to psychopathology is based primarily on the disease model of illness. A disease is an altered state of the organism that is a break from the normal state of functioning that results in some problems, referred to as *symptoms* (Weckowicz, 1984). Just as one type of disease causes physical symptoms (e.g., fever), certain diseases produce brain dysfunctions that may be permanent or transitory, and that result in the behavioral symptoms of psychopathology. Specifically, psychopathology is a disturbance in brain functioning. It is therefore considered a somatopsychological process from the biological perspective. However, it is acknowledged that disturbances in the psychological realm can result in physical symptoms (e.g., anorexia nervosa, peptic ulcers, or asthma). In this case, the process of psychopathology is referred to as *psychosomatic*. In addition to the disease model, some biomedical approaches are based primarily on genetic-constitutional or biochemical models of abnormal functioning. These models will also be reviewed.

#### *Disease Model*

Craighead, Kazdin, and Mahoney (1981) reported that there are infectious, systemic, and traumatic types of diseases. Infectious diseases result from the invasion of the body by extrinsic agents such as bacteria or a virus. The classic example of this type of disease in the psychopathology literature is general paresis, caused by the syphilitic spirochete, the long-term presence of which results in severe brain damage, behavioral disturbance, and, possibly, death.

Childhood infectious diseases such as meningitis and encephalitis may also result in brain-related dysfunctions that produce extreme psychological debilitation (Sacks, 1976).

Although many diseases have widespread effects throughout the body, in systemic diseases the disease itself attacks several organs at once or across time (Ariel & Strider, 1983). Such a disease may have any number of physiological effects, depending on the organs involved and the exact nature of the problem. However, several have been shown to be related to brain functioning in children and hence have psychological effects. One example is acute lymphocytic leukemia, a malignancy that results in an overabundance of white blood cells, which has been shown to result in depressed IQ performance (Eiser, 1980), distractibility, and memory deficits (Goff, Andersen, & Cooper, 1981).

Finally, traumatic diseases are those that result from external events that produce physical damage. As with systemic diseases, the nature and extent of potential brain damage are particular to the type and severity of the trauma and to the organ system involved. There are many examples of this type of disease that are particularly relevant to children and include such traumas as poisons (e.g., lead and mercury), anoxia (lack of oxygen), a variety of dietary deficiencies and excesses, and physical trauma such as a blow to the head. The effects of these diseases are more devastating the earlier they occur in the developmental sequence (e.g., fetal alcohol syndrome). Hence, prenatal and perinatal trauma and trauma very early in life are more likely to have severe effects than trauma later in life.

There is much evidence of the effects of this type of disease on psychological functioning. For example, Taft and Goldfarb (1963) found that schizophrenic children were more likely to show prenatal and perinatal complications that cause neurological anomalies. Also, Chess (1971) reported a higher rate of autism in children who had rubella *in utero* and subsequent birth complications.

### *Genetic-Constitutional Models*

Although the genetic and constitutional models could be considered separately, the genetic component of the constitutional model is so significant that both will be discussed together. The basic premise of the genetic model is that certain psychopathological conditions are the product of inheritance and result from the laws of genetics. There are, of course, some inherited medical diseases that result in psychological dysfunction, such as Huntington's chorea (Rosenhan & Seligman, 1984). There are also specific chromosomal disorders associated with mental retardation and other psychological dysfunctions, such as Down, Klinefelter, Turner, and XYY syndromes. However, the relationship between inheritance and most forms of psychopathology is not direct; it is mediated by the inheritance of abnormal physical structures or modes of physiological functioning that are presumed to underlie the psychological disturbance. Evidence for this type of transmission is given by studies showing possible genetic links to temperament (Thomas & Chess, 1977), neuroticism (Shields, 1962), depression

(Whybrow, Akiskal, & McKinney, 1984), autism (Folstein & Rutter, 1977), and schizophrenia (Fish, 1977; Hemmings, 1982; Shields & Gottesman, 1972).

Genetics plays a strong role in the constitutional model of psychopathology. This model states that a person's phenotype, or physical characteristics, underlies her or his adaptation to the environment. Furthermore, different phenotypes are associated with different modes of adaptation. Everyone's phenotype results from the interaction of a genotype (genetic background) with a particular environment. Hence, a person's phenotype is an evolving concept. From this perspective, psychopathology represents a phenotype on the extreme ends of the normal distribution of traits and characteristics related to adaptation (Weckowicz, 1984). Kretschmer (1925) and Sheldon (1940), who described people's physiques in terms of types and dimensions, respectively, have presented the most extensive of these theories.

The effects of a child's temperament, adaptive style, and maturational course, that, at least very early in life, appear to be primarily biologically based, would also be included in the constitutional model. Each of these constitutional factors affects a child's adaptation to the environment by determining both the challenges and the types of skills needed to deal with them (Achenbach, 1982). Thomas and Chess (1977), for example, have measured temperament in many ways, such as regularity of biological functions, intensity of reactions, positive versus negative mood, and distractibility, to name a few relevant variables. They reported that some of these variables tend to be associated with positive and negative adaptation later in life. Furthermore, these measures of temperament are also likely to affect the formation of an attachment relationship with the child's caregivers. The necessity of this relationship to later positive social behaviors has been well documented (e.g., Ainsworth, 1973).

Finally, the constitutional model includes the impact of particular phenotypes that affect adaptation by altering typical modes of social interaction. Physical abnormalities or sensory handicaps, even those so apparently unimportant as looking "different" or physical unattractiveness, may present a person with special challenges that, if not met, may result in the development of a psychological disorder.

### *Biochemical Model*

The biochemical model states that psychopathology results from a malfunction in the chemical basis of normal behavior. These malfunctions may include an excess of certain chemicals or a deficiency of others. The sources of any of these problems are varied. Components of both the disease and the genetic-constitutional models are likely to operate. The specific substances of most interest in this field are the neurotransmitters. Neurotransmitters account for the transmission of information between neurons, the basic units of the nervous system. Examples of this approach to psychopathology include biochemical theories of hyperactivity (Wender, 1984), depression (Achenbach, 1982), autism (Piggott, 1979), and schizophrenia (Baxter & Melnechuk, 1980; Hemmings, 1982).

## *Assessment and Treatment*

Treatment of psychopathology typically takes place only after extensive description of physical and psychological symptoms and a search for their underlying physical cause. Initial assessment and treatment are typically conducted by a physician. The description of the patient's symptoms is most often accomplished by means of patient self-report, the reports of significant others (e.g., family members), and interview and observation by the physician. The symptoms are typically organized by means of standard diagnostic classification systems such as the DSM-III, the third edition of the *Diagnostic and Statistical Manual* of the American Psychiatric Association (1980). Treatment may begin at this point if the syndrome is clearly identified. If further investigation is warranted, a specialist in the suspected dysfunction may conduct this analysis. In the case of psychopathology, this is typically a psychiatrist. If brain damage or disease is suspected, a neurologist is consulted. The diagnostic tools used by these specialists beyond initial description and interview include a standard neurological exam (e.g., the Physical and Neurological Examination for Soft Signs; see Achenbach, 1982). More sophisticated techniques—such as computer-assisted tomography (CAT scan), which produces a three-dimensional X ray of the brain, or an electroencephalogram (EEG), which detects electrical activity in the brain—may also be used. These techniques may be used in conjunction with any of a variety of psychological tests designed to assess brain damage or dysfunction (Rourke, Bakker, Fisk, & Strang, 1983).

In the medical model, the physician is primarily responsible for producing the cure, and the role of the patient is simply to cooperate with the doctor. Treatment may take any number of forms, depending on the determined cause of the problem. Traumas due to injury, tumor, or stroke may be reduced or eliminated by means of surgery or various methods of maintaining adequate functioning while the body heals itself (Rosenhan & Seligman, 1984). Brain pathology resulting from infectious or systemic diseases may be improved by using techniques to eliminate these diseases. In cases of biochemical dysfunction of the brain, psychopharmacological treatments (drugs) are indicated. In lieu of specific organic problems, this latter sort of treatment is typically used to alleviate the symptoms of the disease. Outstanding examples of this type of treatment include the use of tricyclics and monoamine oxidase (MAO) inhibitors for depression (Klein, Gittelman, Quitkin, & Rifkin, 1980), phenytoin and phenobarbital for epilepsy (Kaufman, 1981), and neuroleptics for schizophrenia (Klein *et al.*, 1980).

## *Evaluation*

The greatest strength of the biological approach to psychopathology is its empirical, scientific base. The concepts of this approach are definable, measurable, and, for the most part, open to manipulation. This type of approach has led to a very well-defined sequence of steps for remediating psychopathology: description of symptoms, search for the cause, and biological treatment based on

the first two steps (Rosenhan & Seligman, 1984). In this regard, the various medical models are more homogeneous in their approach to psychopathology than are the various psychological models. Additionally, this approach has proved very successful in remediating the symptoms (e.g., depression) and, in some cases, the causes (e.g., general paresis) of psychopathology.

The major weakness of the biological approach is the fact that, in most instances of psychopathology, research has failed to identify a biological cause (Craighead *et al.*, 1981). Furthermore, there would appear to be some deviant behaviors for which a biological cause is unlikely, such as phobias (Rosenhan & Seligman, 1984). Although these weaknesses are real, they are somewhat offset by the fact that, although research has yet to find a biological cause of a psychopathology, further research might, and despite no known or likely biological cause, medical treatments may still be effective in alleviating the symptoms, if not the source, of the problem.

## PSYCHODYNAMIC APPROACH

The psychodynamic approach rose to prominence at the turn of the twentieth century and is based primarily on the work of Sigmund Freud. It is still the most extensive and coherent theory of motivation and personality disturbance that exists (Korchin, 1983). It has been referred to as a quasi-medical model of abnormal behavior (Craighead *et al.*, 1981), a description reflecting its roots in the medical approach. However, from the psychodynamic perspective, the symptoms of psychopathology are viewed as reflective of mental disturbance rather than physical disturbance as in the medical model. *Psychoanalysis* has come to have three distinct meanings: a technique of psychotherapy, a method for studying behavior, and a general theory of personality. These aspects of the psychodynamic approach evolved simultaneously over a period of years (Sarnoff, 1971). Variations of this approach have appeared, and many neo-Freudians, such as Alfred Adler, Karen Horney, and Erich Fromm, while taking issue with certain aspects of Freud's theory, continued to follow much of the classic psychodynamic approach. Thus, although psychoanalysis has received much criticism, and many of Freud's early ideas have been revised or discarded, much of the basic approach is still widely accepted.

### *Basic Assumptions*

There are two fundamental concepts of psychodynamic theory: psychic determinism and the unconscious (Konarski & Cavalier, 1982). Freud believed that everything human is meaningful, that nothing in the mind happens by chance, and that we are motivated by drives or instincts over which we have little control and of which we are only dimly aware. He called this the *principle of psychic determinism*. Because of our lack of awareness of many aspects of our behavior, Freud also postulated the concept of the unconscious mind. The unconscious is thought to be a reservoir of wishes and impulses that have been

repressed, but that have an important influence on our everyday thoughts, feelings, and behavior.

The psychodynamic approach views an individual's personality and behavior as resulting from the interaction of the three components of personality: the id, the ego, and the superego. The id is the inborn source of all instinctual drives. The two major instinctual drives are life instincts (*Eros*) and death instincts (*Thanatos*). These are generally referred to as the sexual and aggressive drives, respectively. Freud called the energy that fuels the sexual instincts *libido*. It should be noted that Freud used the term *sex* to refer to almost anything pleasurable; indeed, many of the needs that he classified in this category (e.g., affection, warmth, and nourishment) are not what we typically think of as sexual. However, Freud used the term *sexuality* to make clear the unifying aspects of these needs and their connection with the survival instincts of the individual. The id is said to operate on the pleasure principle; it is selfish and seeks only to gratify instinctual needs without regard to morality or reality. The id is capable of generating mental images and wishes, referred to as *primary process thinking*, but cannot perform the actions necessary to satisfy its demands.

The ego develops in response to the individual's need to interact with the environment. The ego operates on the reality principle, which means that it strives to meet the demands of the id in ways that are consistent with external reality. The ego is not concerned with the morality of its actions and does not attempt to block the desires of the id; rather, it merely seeks to postpone gratification until an object suitable to satisfying the id has been located. Thus, any conflict between the id and the ego occurs because of this delay of gratification, not because of the morality of the desire.

The third system, the superego, develops to monitor and control the desires of the id. The superego, commonly referred to as the *conscience*, incorporates the moral and cultural values of society and is concerned with right and wrong. Unlike the ego, which seeks to compromise, the superego strives for perfection. It tries to block the undesirable impulses of the id. In its own way, the superego, in its attempts to ensure that the ego will inhibit the desires that are considered immoral, is as persistent and unyielding as the id. When there is conflict between the somewhat different goals of each of the three parts of the personality, the individual experiences a great deal of anxiety, and abnormal behaviors may result.

The potential conflicts between the parts of the personality mentioned above produce anxiety, which serves as a warning of impending danger and/or a painful experience, and which forces the person to take some action to reduce it. If the ego cannot cope with the anxiety by rational measures, it resorts to irrational ones. These irrational protective measures are called *defense mechanisms* and are used to some extent by all individuals. Although defense mechanisms alleviate anxiety, they do so by distorting the individual's perception of reality. This discrepancy is undesirable and may lead to behavior that is irrational and maladaptive. Additionally, many of our wishes, desires, and painful memories are repressed because of the anxiety they arouse. These desires continue to seek expression and create anxiety for the individual. If this unconscious material is



not brought into awareness and dealt with, it may also lead to abnormal functioning.

Personality development is viewed as progressing through various stages of psychosexual development. Freud delineated five stages of development, each characterized by a predominant mode of achieving pleasure. The first stage, the oral stage, occurs during the first two years of life, and the mouth is viewed as the primary source of pleasurable sensations. The anal stage occurs from ages 2–3, when the anal membranes are the major source of pleasurable sensations. The phallic stage occurs next, from ages 3–5, and self-stimulation of the genitals provides the greatest source of pleasure. During the latency stage (ages 6–12), the individual focuses on developing skills and other activities, and sexual drives are less important. The final stage, the genital stage, occurs after puberty, when heterosexual relations become the focus of pleasure.

To develop normally, Freud believed an individual must successfully pass through each stage, dealing with the developmental problems and conflicts as they arise. Failure to do so leads to fixation at that stage of development and hinders the normal development of personality. Individuals cannot successfully complete successive stages if they have not resolved the problems that occur at earlier stages of development. When under stress, an individual also may regress (go backwards) to earlier stages of development. Fixation or regression is rarely total. For example, a child who as an infant failed to receive adequate oral stimulation may, under stress, regress to thumb sucking. As an adult, this person may engage in oral activities such as drinking or eating to excess when subjected to stress.

### *The Nature of Normal and Abnormal Functioning*

The psychodynamic approach views abnormal behavior as resulting from a conflict among the various parts of the personality. Conflicting demands of the id, the ego, and the superego produce anxiety that the individual seeks to reduce or eliminate. If the individual can cope with the anxiety realistically, the conflict is solved and the anxiety eliminated. If, however, the stress and consequent anxiety remain, the individual resorts to ego-defense mechanisms that distort reality. These defensive actions are frequently immature and inadequate. They lead to maladaptive (abnormal) behaviors when used to excess.

### *Assessment and Treatment*

The goal of assessment is to collect information about behavior problems and to relate these problems to relevant factors concerning the development and maintenance of the behavior (Erickson, 1982). Personality assessment focuses on two goals: identifying the conflicting thoughts and feelings that cause the individual to experience anxiety and determining the preferred coping styles and techniques, adaptive as well as maladaptive, that account for why the individual is dealing with anxiety in a certain way (Weiner, 1983).

Therapists are faced with some differences between children and adults

when assessing mental disturbance. First and foremost is the fact that the child is still a developing individual, which means that the symptoms and anxieties displayed do not have the same significance they would have in an adult. Indeed, they may be only temporary manifestations of stress rather than indicators of lasting pathology, and after some adaptation to that particular phase of development, the symptoms may subside on their own. Thus, differentiating between transient symptoms and the beginning of more permanent pathology is sometimes very difficult. A second problem faced by child therapists is that the child does not have the same life tasks as an adult (e.g., work, family, and sex) and therefore lacks the traditional benchmarks for measuring adjustment or mental health, as well as progress through therapy (A. Freud, 1968).

For the therapist, the assessment of childhood disturbances begins with the initial contact and continues throughout the therapy process. The therapist may use a variety of techniques. Because children lack the verbal skills to interact with the therapist as adults do, the therapist depends a great deal on information obtained from other sources, particularly the parents. The therapist attempts to fill out a developmental profile of the child to aid in the assessment and treatment of the child.

The therapist believes that a child's abnormal behavior occurs because his or her normal progression through the stages of personality development has been hindered. The goal of analysis is to work through the conflicts and to assist the child in dealing with them directly rather than resorting to ego defense mechanisms. Psychoanalysts attempt to "undo the various repressions, distortions, displacements, condensations, etc., which had been brought about by the neurotic defense mechanisms" (A. Freud, 1946, p. 49). To achieve this goal, therapists establish a trusting, nonthreatening atmosphere in which the child is encouraged to express her or his feelings, fantasies, emotions, and behavior. Therapists tend to rely on children's play as a substitute for free association and use this medium to assess the client's conflict areas. Although treatment is focused on the child, frequent consultation with the parents often occurs, particularly when the child is very young. Because of the young child's limited verbal skills, the parents must be relied on to give information about the child's symptoms and behavior outside the therapy sessions.

Therapists take a generally nondirective role in therapy, setting as few limits as possible and following the free expression of the child's thoughts and behaviors as they appear. To this end, therapists must learn the child's language rather than impose their own. The general goal is not symptom removal but the fulfillment of the normal course of development to the greatest extent possible. Treatment usually occurs several times per week for one or more years. Often, a parent participates in the therapy. As a child progresses and improves in verbal skill, the parent is gradually phased out of the treatment process.

### *Evaluation*

Psychoanalysis was the first systematic attempt to relate psychological factors to abnormal behavior. Just as the biological approach replaced demons and

witches with organic pathology as the cause of abnormal behavior, the psychodynamic approach replaced brain pathology with excessive use of ego defenses as the basis of at least some mental disorders (Coleman, Butcher, & Carson, 1980). Freud was a scientist and a practitioner who continued to modify and change his theories until his death in 1939. His followers are many, and psychoanalysis as a theory of personality, a technique of therapy, and a method for studying behavior remains one of the most prominent theories of our time.

Perhaps the most remarkable feature of the psychodynamic approach is that it developed and was widely accepted despite the lack of empirical research to support its concepts. This is not true of any other theory of human behavior, abnormal or normal. Many of its concepts are difficult to quantify or observe, so that research is difficult. In addition to the lack of scientific evidence for the theory, criticisms have focused on its excessive emphasis on sexuality, the unconscious, and the darker side of basic human nature. Although almost any behavior can be explained on a *post hoc* basis, almost nothing can be predicted from this theory (Sundberg, Taplin, & Tyler, 1983).

Psychodynamically oriented therapy is most appropriate for the intelligent, verbal client. Seriously disturbed individuals, such as schizophrenics, generally do not profit from this approach (Coleman *et al.*, 1980). Furthermore, this approach has traditionally required a psychoanalyst (generally a psychiatrist who has undergone a personal analysis) to perform the therapy. This elitism has severely restricted the number of therapists available and, coupled with the time and expense involved, has made psychoanalysis a treatment for the affluent.

Despite the above criticisms, psychodynamically oriented treatment continues to flourish. Many people who have undergone analysis believe that they have profited from their therapy, particularly with respect to understanding themselves and others. With all its faults, psychoanalysis has had—and continues to have—a profound influence on the understanding and treatment of human behavior.

## BEHAVIORAL APPROACH

The behavioral approach to psychopathology is relatively heterogeneous regarding the understanding and treatment of abnormal behavior and encompasses an expanding array of related models (Weckowicz, 1984). Agras, Kazdin, and Wilson (1979) identified four different models within this approach, including applied behavior analysis, a neobehavioristic mediational S-R model, social learning theory, and cognitive behavior therapy.

Applied behavior analysts tend to be proponents of the empirical, atheoretical approach espoused by Skinner (1953). This camp relies primarily on the principles of operant conditioning, which emphasizes the consequences of behavior, to explain and remediate abnormal functioning. The neobehavioristic mediational S-R model relies on intervening variables and hypothetical constructs (e.g., anxiety) to explain psychopathological behavior. The principles of classical conditioning and counterconditioning are emphasized, and the learn-

ing theories of Pavlov, Guthrie, and Hull, to name a few, are the basis of analysis and treatment. In contrast to the atheoretical approach of applied behavior analysis, this model is also most likely to develop theories of abnormal functioning and remediation (e.g., Eysenck, 1979; Seligman, 1975; Wolpe, 1958). Social learning theory focuses on the interaction between the person and his or her environment to explain behavior and recognizes to a greater degree than the previously mentioned approaches the role of individuals in regulating their own behavior. Bandura's (1977) theoretical efforts currently provide the major basis of this camp. Finally, cognitive behavior modification is a relatively recent approach to understanding and managing behavior that focuses primarily on a person's thoughts to control his or her actions. Several variations of this theme exist, including the work of Meichenbaum (1977), of Ellis and Grieger (1977), and of Beck (1976).

Although these differences between groups are significant, these proponents of the behavioral approach have several basic assumptions in common about the nature of behavior and psychopathology.

### *The Nature of Normal and Abnormal Functioning*

The focus of study in the behavioral approach is behavior, defined as any measureable act on the part of a person (Logan & Gordon, 1981). This definition encompasses a wide range of different responses and is not necessarily limited to gross, overt actions. Behavioral interpretations of complex behaviors, such as language and emotion, and the therapeutic efforts of the cognitive behavior modifiers exemplify the variety of responses addressed by this approach. As opposed to the medical and psychodynamic models, behavior is not viewed as symptomatic of disease or any other dysfunction, psychological or physical. The focus of assessment and treatment is the abnormal behavior itself and those functional aspects of the environment that surround the behavior (Konarski & Cavalier, 1982).

Another foundation of the behavioral approach is the idea that behavior is lawful, that is, determined by specific events. In contrast to the humanistic approach, for example, behaviorists believe that all behavior follows certain laws and that these laws determine the very nature of behavior. It is also assumed that these laws can be discovered by means of the scientific method (Schwartz & Lacey, 1982). This latter idea dates back to Watson's views (1919) on the nature of psychological investigation.

Behaviorists also believe in the idea that the source of a person's behavior is experience (Schwartz & Lacey, 1982), defined as behavior coming into contact with environmental events. Therefore, the events that determine behavior lie outside the individual, in his or her environment. The environment is composed of stimulus events, which are defined as any change in physical energy that an organism can detect (Logan & Gordon, 1981). Typically, behaviorists are interested not in the entire class of stimulus events but only in those that are functionally related to behavior, that is, that influence behavior in a particular way. For example, reinforcing stimuli are those environmental events whose

presentation increases behavior, punishing stimuli are those environmental events whose presentation decreases behavior, and discriminative stimuli mark the time and/or place of reinforcing or punishing stimuli.

It should be noted that the exact degree of control of these stimulus events over behavior differs across the behavioral models previously mentioned, with applied behavior analysis and the neobehavioristic mediational S-R model representing the stronger degrees of external control and cognitive behavior modifiers and social learning theory the smaller degree of control. However, all theorists see functional stimulus events such as those described above as critical determinants of behavior. As behavior comes into contact with these events, it changes. This process is called *learning*, and the laws that behaviorists seek are therefore laws, or principles, of learning. Furthermore, these principles are presumed to hold across all types of behaviors and even across species. This assumption accounts for the fact that most of the principles of learning that have been applied to understand and control human behavior were discovered in research conducted with lower species.

The preceding discussion leads to a very important conclusion regarding abnormal behavior. That is, according to the behavioral approach, the very same forces that underlie the development of normal behavior also underlie the development of abnormal behavior (Ullman & Krasner, 1969). The principles of learning explain the development and maintenance of abnormal behavior as well as they do normal behavior. Therefore, a person who acquires abnormal behaviors is one who has simply experienced environmental interactions during development different from those experienced by most other members of a particular society. Specifically, abnormal behavior may be seen as resulting from a lack of reinforcement for, or from a punishment of, appropriate behaviors. This results in a failure to learn or display the responses expected by a society. Alternatively, abnormal behavior may result from reinforcement for, or from lack of punishment of, inappropriate behaviors, resulting in the acquisition and display of responses not expected by society. Finally, abnormal behavior may also result from a failure to learn the proper discriminative stimuli, which would result in the occurrence of behaviors that are abnormal to the extent that they take place at the wrong place and/or time according to the expectations of a society.

### *Assessment and Treatment*

Assessment and treatment are not separate phases and are intimately related throughout therapy in the behavioral model. The behavioral approach to assessment relies primarily on the direct measurement of behavior and the environment. Direct measurement involves the assessment of the specific behavior(s) of interest without any assumption that the results are reflective or indicative of anything beyond the occurrence of the behaviors themselves. This type of assessment is consistent with the behavioral view that the behavior is the problem rather than a symptom of dysfunction elsewhere. The goal of this assessment is primarily to determine what a person is or is not currently doing and what stimulus events are controlling that functioning (Nelson & Hayes,

1979). Behavioral assessment involves the determination of the present state of affairs and is not especially concerned with the historical determinants of behavior.

Hersen and Barlow (1976) divided the measures typically used in the behavioral approach into motoric, self-report, and physiological measures. The most frequently used are the motoric measures, which are most likely to involve direct observation of the behaviors of interest. Physiological measures involve assessment of primarily autonomic variables, such as heart rate, electromyography (EMG), or blood pressure, and are most likely to be used by behaviorists interested in biofeedback. Self-report measures are recommended as adjuncts to the other measures or in situations where the other forms of assessment are impractical. By itself, this form of measurement is not typically recommended because it is the measure most open to distortion by the client (Hersen & Barlow, 1976).

Behavioral assessment involves not only assessment of the particular target behavior(s) but of the environmental antecedents and consequences of those behaviors. This assessment is done to determine the specific stimulus events currently maintaining or failing to produce the target behavior. These stimuli are then open to manipulation in the treatment phase.

Behavioral models typically take a very pragmatic approach to treatment. In contrast to the biomedical and psychodynamic models, there is very little focus on diagnosis or on determining the nature of the problem. The central concern is how the problem behavior can be modified to promote adaptive functioning. Consistent with the manner of assessment, behavioral treatments are highly individualistic, focusing on the client's current behavior and environmental situation. The analysis of this interaction is the basis for developing a behavior change program. Change is produced by modifying those stimulus events that are currently resulting in maladaptive behavior or are failing to produce adaptive behavior. The behaviors treated in a program are particular to each case, depending on the needs of the client. Treatment is directed at those so-called target behaviors that are the specific behavioral excesses or deficits of the person that give rise to the problem. Treatment is apt to take place in real-world settings, that is, in the environment where the problem exists. A distinguishing characteristic of the behavioral approach is the constant assessment of behavior throughout the treatment phase. This intensive monitoring of the individual gives feedback to the therapist by documenting the progress the client is making and allows for rapid alterations of the treatment program, as needed, to ensure successful behavior change. Systematic evaluation of treatment outcome and procedures is also a hallmark of the behavioral approach.

The particular treatments used vary across the models. Applied behavior analysts are most likely to directly apply the principles of operant conditioning, particularly positive reinforcement, to manipulate the target behaviors in real-world settings. The neobehavioristic mediational S-R model often uses more complex treatments, such as systematic desensitization, flooding, covert conditioning, or biofeedback, to remediate a variety of problems, particularly those based on fear and anxiety. Social learning theorists rely heavily on the tech-

niques of modeling and imitation to develop adaptive behaviors across a variety of settings. Cognitive behavior modifiers rely on altering such responses as self-instructions and negative beliefs through the use of instructions, feedback, practice, and positive reinforcement.

### *Evaluation*

The behavioral model is rapidly becoming the most dominant of the psychological models of psychopathology in both understanding and treating abnormal behavior. This trend is very likely due to the relative theoretical simplicity and effectiveness of this approach. Although it appears clear that early claims of the superiority of this model to other treatment approaches may have been exaggerated, and the final analysis is not yet in (Kazdin & Wilson, 1978), the sheer breadth of application (cf. Craighead *et al.*, 1981) in conjunction with its apparent effectiveness is indeed impressive. The pragmatic nature of the treatment and research efforts of the proponents of this model have presented practitioners with a variety of tools to manage maladaptive behavior. The effect of this model has been particularly profound on treatment procedures for children (Achenbach, 1982) and other special populations, such as the mentally retarded (Whitman, Scibak, & Reid, 1983).

Although the principles of learning are the primary basis for the treatment procedures commonly used by this approach, the link between these principles and the actual treatments is not often clear, as the behavior therapist engages in trial-and-error experimentation to remediate the problem (Achenbach, 1982). Even in the most structured treatments, the relation of the methods to principles of learning is not always direct (Kazdin & Wilson, 1978). This apparent fact results from the pragmatic nature of behavioral treatment and is an advantage in terms of discovering effective treatments but violates the assumption that techniques are based on known principles of learning. It seems, however, that this inconsistency has not been fatal to the model. Overall, this model has provided more treatment procedures for a greater variety of problems than any of the other approaches.

## HUMANISTIC APPROACH

Humanistic psychology, sometimes called the *third force* in psychology, emerged as a major approach in the 1950s and 1960s. It grew out of dissatisfaction with the psychodynamic and behavioristic approaches to personality. There are many names associated with the development of humanistic psychology: Gordon Allport, Charlotte Buhler, Abraham Maslow, Carl Rogers, Rollo May, James Bugental, and Fritz Perls are some of the most prominent. Although humanism encompasses many different therapies and techniques, the most important factor unifying them is their strong reaction against what they view as the limited conception of human behavior held by the psychodynamic and

behavioristic approaches. The humanists believe that psychology has failed to address itself to many of the problems that are significant in human lives. In addition to being concerned with the importance of learning and other scientific approaches to behavior, humanistic psychologists also deal with topics such as love, acceptance, hope, values, personal growth, and self-fulfillment (Coleman *et al.*, 1980).

Humanism is an orientation toward the whole of psychology and a statement of values, as well as a theory of human behavior. It emphasizes respect for the worth of persons, open-mindedness about acceptable methods of study, and exploration of new aspects of human behavior (Severin, 1965). In general, the humanistic approach, like the psychodynamic approach, places attention on what clients find within their own inner selves and is characterized as an "inner exploration" therapy rather than an "action-oriented" therapy.

### *Basic Assumptions*

Although the specific approaches vary according to the particular individual, humanistic psychologists have several principles and themes in common. They view the individual in a much more positive light than do the psychodynamic theorists. Humanists believe that human needs are "higher" than just pleasure seeking or avoidance of pain. The search for beauty, goodness, truth, and justice is a motive that influences our behavior. Humanists take a holistic approach to behavior. They are concerned with the total person, not just parts of the personality. Emphasis is placed on the belief that personality is continually developing and that the end goal is self-actualization (Weckowicz, 1984). *Self-actualization* is defined as the inherent tendency of the organism to develop all of its capacities in ways that serve to maintain or enhance the organism (Rogers, 1959). Humanists emphasize the importance of individuality, that is, the strivings to find sense and meaning in our experiences; the belief that we are active participants in life and that we have the freedom to shape our destiny; and the belief that, if left unfettered, will develop into rational ("good") human beings.

The concept of self is analogous to the ego in the psychodynamic approach. However, for the humanists, the self is a broader concept and includes the individual's strivings toward self-fulfillment and self-actualization. The individual reacts to events according to the manner in which they are perceived. If psychologically threatened, the individual defends against this threat by the use of defense mechanisms.

Humanists also stress the individual's innate tendencies to behave in a manner consistent with her or his value system. They focus on the individual's choices in life and believe that only by making rational and morally acceptable choices can one achieve a meaningful and fulfilling life. Furthermore, unlike in the behavioral and psychodynamic approaches, the humanists believe that innate human tendencies are constructive rather than destructive, and that individuals will strive toward growth and self-fulfillment if given the environment in which to do so.



## *The Nature of Normal and Abnormal Functioning*

Humanistic psychologists are oriented more toward mental health than mental illness. Their view is that mental health is a continuum. At one end of the continuum are the few self-actualized individuals who have achieved mental health. Below them are the bulk of the population, those individuals who are reasonably well-adjusted, noncreative conformists. The psychoneurotics are next, and the overt psychotics are at the extreme negative end of the continuum.

Instead of asking what constitutes psychopathology, the humanist is more concerned with how individuals have failed to come to terms with themselves and/or their environment (Weiner, 1983). Rather than abnormal behavior, the humanist speaks of problems in living, such as problems in experiencing oneself, the inability to find pleasure in one's activities, and failure to make meaningful contact with others (Jourad, 1964; Rogers, 1961). Maladjustment (abnormal behavior) occurs as a result of the blocking of personal growth and natural tendencies toward health. Such blocking can occur as a result of excessive stress, distortion of the perception of reality through excessive use of ego defense mechanisms, and faulty environments and/or learning (Coleman *et al.*, 1980)

## *Assessment and Treatment*

Because humanistic psychologists believe in the uniqueness of each individual, they find the use of traditional assessment techniques dehumanizing and unnecessary for treatment purposes. They seek to identify the unique, individual meanings that people give to their experiences, not how they are like others. The humanists do not believe in attempts "to classify people according to diagnostic labels, shared personality traits, or quantitative positions along various dimensions of behavior" (Weiner, 1983, p. 25). Thus, the proper focus of assessment is to identify the uniqueness of the individual and how that individual interacts with and interprets his or her environment. Because of this belief, humanistic psychologists generally opt for immediate therapy, without any prior assessment. When working with children, some assessment techniques may be used to aid in understanding the development of the child. Because humanists take a developmental approach to understanding individuals, they may use intelligence tests to indicate the level of cognitive development of the child. There are similar standardized tests for assessing social development and motor skills. However, it should be kept in mind that any assessment technique is used to understand the functioning of that one child and not as a classification tool.

For the humanist, therapy usually takes a self-help approach for expressing feelings, asserting oneself, and exploring one's ways of relating to other people. Examples of such therapies include sensitivity training, Gestalt therapy, and transactional analysis (Fischer, 1978). The aim of treatment is to promote personal growth, self-awareness, and understanding of how one relates to the world. It is a nondirective type of therapy and, indeed, is seen more as a personal encounter rather than "treatment" conducted by a therapist. It is the task of the thera-

pist to help clients find, accept, and be themselves. Toward these ends, the therapist establishes a "psychological climate" in which the individual feels free to express his or her innermost feelings and thoughts. As individuals become aware of repressed thoughts and feelings, they learn to incorporate these into their being and to accept them as an integral part of themselves. The self-awareness and self-acceptance, in turn, generate a better integrated personality, which can continue its growth and drive toward self-actualization.

A typical technique used by Carl Rogers and his followers is for the therapist to listen attentively and acceptingly to what the client says, reflecting back the client's feelings as well as the content expressed. The therapist does not direct the course of therapy nor the content of any session. Instead, the therapist, in an effort to clarify the client's feelings, restates, without judging or interpreting, what the client has said. Basically, the therapist must convey an "unconditional positive regard" for the client, a nonpossessive caring for or acceptance of the client's individuality. Other humanistically oriented therapists go further in directing the therapeutic process but maintain the same unconditional positive regard for the client, emphasizing the importance of genuine warmth and caring. The emphasis is still on the client's search for self, and the therapist is merely a facilitator in this search.

Like psychoanalysis, the humanistic approach to therapy is available only to the intelligent and verbal client. As with adults, therapy with children emphasizes the development of a positive relationship between the therapist and the child, a relationship in which the child is free to express her or his innermost feelings. The therapist attempts to create an atmosphere of permissiveness in the therapy setting, and most often, this is done through the use of play. The goal of the therapy is to foster the natural development of the child, which has been hindered for some reason. The therapist assumes that the child can solve his or her own problems (Erickson, 1982). Thus, the role of a therapist is a passive one in which she or he recognizes and reflects back the child's feelings. The child behaves, the therapist then reflects the feelings behind this behavior, and in that way, the child develops insight into his or her own behavior. The assumption is that, "as the child grows and discriminates between self and others, she or he assigns 'ownership' of life responsibilities to self or others" (Sundberg *et al.*, 1983, p. 171).

### *Evaluation*

The humanistic approach to therapy encompasses many different therapies and techniques. In a book presenting innovative approaches to therapy, Corsini (1981) listed 250 different kinds of psychotherapy, many of which are covered by the rather wide umbrella of humanism. One prominent humanistic approach, client-centered therapy, is probably the most researched method of psychotherapy in existence. Unfortunately, the same cannot be said for most of the other methods in this approach.

One serious criticism of the general framework of humanism is that it is overly optimistic. The humanistic view of people as supremely rational beings is

in sharp contrast to the psychodynamic view of the basic irrational nature of human beings. We all recognize that, indeed, there are people with very pathological mental states whose own growth processes are unlikely to solve their problems. For some humanists, the belief in the efficacy of growth is almost religious in nature (Sundberg *et al.*, 1983), and it needs to be tempered by skepticism.

An additional criticism is the limited theoretical development of humanistic approaches other than Rogers's client-centered approach. Because many humanists view their approach to therapy as appropriate for anyone—that is, as growth experiences rather than therapy—there is the tendency to ignore the fact that many people seeking assistance may have serious problems. In fact, screening of individuals for pathology is antithetical to the principles of humanistic approaches. Experience has shown that not all individuals are able to respond effectively to some of the techniques used (Sundberg *et al.*, 1983).

In spite of these criticisms and the varying degrees of empirical support underlying humanistic approaches, many of these techniques have much to offer individuals who are experiencing difficulties in living. The unifying theme of basic human goodness and strivings toward self-actualization represents a needed contrast to other therapeutic approaches and provides many different individuals with choices in treatment.

## CONCLUSIONS

In addition to a description, we have attempted to delineate the contributions and limitations of each of the four major theories of psychopathology described in this chapter. Each has made—and is making—significant contributions to the assessment and treatment of child psychopathology. The common contribution of all theories is at a broad level. It is their role as the guiding force of therapy. All types of treatments for psychopathology are planful strategies for change guided by a theory of abnormality and treatment. Although each theory specifies different useful treatments, they all share this common role. However, each theory also has some limitations. For this reason, theorists and practitioners have discussed the concept of a supermodel of abnormal behavior (Weckowicz, 1984) that would combine the useful aspects of all models. Unfortunately, the divisions between the theories on such important issues as the role of hypothetical constructs and the locus of causal variables are extremely large and are not readily integrated. It would seem that a supertheory would be difficult to establish without violating some basic assumptions of each model. It is the conclusion of this chapter, therefore, that the multitheory approach currently in force is useful and should continue. Although it results in pluralistic goals, it ensures a variety of treatments and models of psychopathology. Because no theory has been able to fully account for the development and treatment of abnormal behavior, this multifaceted, broad approach to these issues appears warranted.

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# 3 *Diagnostic Classification Systems in Child Psychopathology*

JUAN E. MEZZICH AND ADA C. MEZZICH

Several key conceptual and methodological developments on psychopathological evaluation and diagnosis have taken place since the mid-1960s. These developments are reviewed first to pave the way for the delineation and discussion of specific diagnostic systems. These include standard systems of paramount importance, such as the current version of the World Health Organization's (1978) *International Classification of Diseases (ICD-9)* and the third edition of the American Psychiatric Association's (1980) *Diagnostic and Statistical Manual of Mental Disorders (DSM-III)*. Also considered are diagnostic systems specifically developed for children and adolescents. Finally, a note is presented about prospective systems, such as the revised DSM-III and ICD-10.

## MEANINGS AND PURPOSES OF PSYCHIATRIC DIAGNOSIS

*Diagnosis*, from an etymological viewpoint, has two main meanings relevant to understanding its crucial role in psychopathology.

1. *Diagnosis* means "distinguishing." In order to identify precisely the disorder affecting or experienced by the individual under examination, it is necessary to sort out various categories of disorders, weighing available information for and against each category.
2. *Diagnoskein* means "to know thoroughly." In this sense, diagnosis involves a comprehensive description of the individual's condition.

These definitions explicate the fundamentals of diagnosis and also clarify the origins and directions of the most important conceptual and methodological advances in psychopathological diagnosis that have taken place during recent decades. The first meaning of *diagnosis*, with its emphasis on accurate identification and differentiation of categories of illness, underlies the development of more precise, explicit, and objective procedures for assigning specific diagnostic labels to patients under examination. The second meaning of *diagnosis*, involving

comprehensive and thorough description of the clinical condition, is reflected most clearly in the multiaxial diagnostic model.

Classification is a basic scientific activity, as it involves both the systematic description of objects of interest and the establishment of general laws or theories by means of which particular events may be explained and predicted (Hempel, 1965). Diagnosis is epitomized by classification, although the structural flexibility of such new models as the multiaxial system allows a diagnostic formulation to include both categorical and dimensional components. This is reflected by the fact that nosologies and diagnostic systems have been traditionally organized as catalogs of categories and that the product of the diagnostic process has been the identification of the category or categories most suitable to describe the condition of the patient. Thus, a diagnosis, as a class or category, is frequently perceived as the focal point of thought in working with a patient: backward to etiology and forward to prognosis and treatment. Consequently, as Feinstein (1967) put it, diagnostic categories provide the locations where clinicians store the observations of clinical experience, and the diagnostic taxonomy establishes the patterns according to which clinicians observe, think, remember, and act.

The purposes of diagnosis include the following objectives:

1. *Organization of clinical information.* To this end, a diagnostic formulation must structure the essentials of the patient's condition in a way that is coherent, concise, and retrievable.
2. *Communication among professionals.* To enhance effective interchange of information among professionals working with mentally ill patients and populations, a diagnosis must be clear and precise in addition to being a faithful portrayal of the psychopathological condition.
3. *Prediction of clinical course and selection of treatment.* This is probably the most compelling purpose of diagnosis, although certainly not the easiest to achieve or demonstrate.
4. *Etiological elucidation and theory development.* This refers to the heuristic value of diagnostic structures both to clarify causative factors and to foster systematic understanding of the nature and unfolding of psychopathological processes.

## DIAGNOSTIC VARIABILITY AND RELIABILITY

The process of psychopathological evaluation typically includes interviewing the subject as well as available relatives and associates, reviewing documents that contain information on the subject's clinical history, organizing the information obtained into appropriate historical and examination formats, and formulating a diagnostic summary. This is a complex process, which in some cases includes additional elements such as conducting formal testing.

In the interest of obtaining reproducible or reliable evaluative judgements, analyses have been carried out to identify the main sources of undesirable vari-

ability in the evaluation process (e.g., Ward, Beck, Mendelson, Mack, & Erbaugh, 1962). The following are two of the major sources of diagnostic unreliability:

1. Variability in the process of obtaining clinical information.
2. Variability in the process of diagnostic formulation.

Two major methodological developments have taken place since the mid-1970s specifically addressed to minimizing the two undesirable kinds of variability listed above. The developments are structured clinical interviews and explicit diagnostic criteria.

### *Structured Clinical Interviews*

Generically, these procedures attempt to decrease variability in the process of obtaining clinical information. They do this by controlling one or more of the following aspects of this process: specifying the items to be investigated, providing definitions or prompts for these items, specifying questions that explore the items of interest, and providing instructions for rating the presence and severity of the items involved.

One of the earliest and most widely known structured clinical interviews is the Present State Examination developed by John Wing and associates at the Institute of Psychiatry in London (Wing, Cooper, & Sartorius, 1974). It has been used in several international studies on psychodiagnosis, including the U.S.–U.K. Diagnostic Project (Cooper, Kendell, Gurland, Sharpe, Copeland, & Simon, 1972) and the International Pilot Study of Schizophrenia (World Health Organization, 1973). The Present State Examination, in its ninth edition (Wing, Cooper, & Sartorius, 1974), has 140 items that attempt to cover current (past month) psychopathological manifestations. The procedure guides the interviewer in the exploration of these items through branching and cutoff points and by providing obligatory and optional probing questions as well as instructions for rating each item on a 3-point scale (absent, mild, severe) plus special codes for “not known” and “not applicable.” Definitional statements for the items are separately furnished in a glossary. The following segment taken from the Present State Examination shows both the obligatory (\*) and probing (in parentheses) questions and the severity-rating instructions provided for one item:

\* Do you get thoughts coming into your mind even when you try to keep them out?

(Do you find it difficult to make decisions even about trivial things?)

(What happens when you try to stop?)

RATE OBSESSIVE IDEAS AND RUMINATION

1 = Symptom of moderate intensity or, if severe, present less than 50% of the time

2 = Symptom present in severe degree, more than 50% of the past month.

Another well-known structured clinical interview is the Schedule for Affective Disorders and Schizophrenia (SADS) developed by Endicott and Spitzer (1978) within the framework of the NIMH Collaborative Program on the Psychobiology of Depression. The SADS has two parts, one dealing with the current episode and the other with past psychiatric disturbance. Part 1 deals with the



symptomatology of the subject both at the more severe level of the current episode and during the week preceding the evaluation. The items are rated on scales having various numbers of points, ranging from 3 to 9, and many are judgmentally clustered into eight summary scales. Part 1 also assesses the presence or absence of serious impairment in functioning or hospitalization during the week before the interview. Part 2 of the SADS explores past psychiatric disturbance in terms of both symptoms and presence or absence of serious impairment in functioning during the most severe period. The SADS has three versions: (1) a regular one; (2) a lifetime version, which is similar to the regular Part 2 except that the time period is not limited to the past and includes any current disturbance; and (3) a version for measuring change, which has a symptom set similar to the regular Part 1 and can be used for subsequent evaluations. The schedule provides for a progression of questions, items, and criteria that rule in and rule out specific diagnoses from the Research Diagnostic Criteria. The SADS instructs the interviewer to use all sources of information available and as many general or specific questions as necessary, and it provides defined levels of severity for each item. The following illustration presents the questions suggested and the rating instructions provided for an item from the manic syndrome:

*Unusually energetic, more active than his usual level without expected fatigue*

Have you had more energy than usual to do things?

(More than just a return to normal or usual level?)

(Did it seem like too much energy?)

0 No information

1 No different than usual or less energetic

2 Slightly more energetic but of questionable significance

3 Little change in activity level but less fatigued than usual

4 Somewhat more active than usual with little or no fatigue

5 Much more active than usual with little or no fatigue

6 Unusually active all day long with little or no fatigue

Rigidly structured interview procedures are exemplified by the National Institute of Mental Health (NIMH) Diagnostic Interview Schedule (DIS) developed by Robins, Helzer, Croughan, and Ratcliff (1981) for use in situations in which it is not feasible to have interviewers with professional training in psychopathology. Its main application has been the Epidemiological Catchment Area project sponsored by NIMH to survey for psychiatric disorders in the general population using lay interviewers. The information collected is then processed through computerized algorithms that make diagnostic decisions covering all diagnoses in Feighner, Robins, Guze, Woodruff, Winokur, and Muñoz's diagnostic system (1972) and the Research Diagnostic Criteria (Spitzer, Endicott, & Robins, 1978), as well as a group of DSM-III diagnoses (selected from Axes I and II). All diagnoses are made on a lifetime basis first, and then their current status is determined. To allow for making diagnoses by computer, the interview covers each criterion in the form of one or more precoded, closed-end questions. For example, the following are the standard codes for a symptom question such as

“Have you ever been bothered by periods of weakness, that is, when you could not lift or move things you could normally lift or move?”:

1. The answer to the question was “no.”
2. The answer to the question was “yes,” but the symptom was always so mild that the respondent did not seek professional help, did not take medication for it more than once, and did not feel that it interfered with his life a lot (i.e., it was below the “critical” level).
3. The answer to the question was “yes” and the symptom was above the “critical” level but it was always the result of the respondent’s use of medicines, drugs, or alcohol.
4. The answer to the question was “yes” and the symptom was above the “critical” level but it was always the result of a physical illness.
5. The answer to the question was “yes,” the symptom was above the critical level, and at least once it was not explained by either the use of medicines, drugs, or alcohol, or a physical illness. Thus, this is a possible psychiatric symptom.

Actual use of the DIS in certain community and primary-medical-care settings (Ganguli & Saul, 1982) suggests that, for several areas of the interview, the standard probing provided for laypersons is inadequate and that they require clinical judgment in order to probe and code with validity. A more fundamental limitation of the DIS—and, in general, of rigidly structured clinical interviews—is that its application does not appear to be feasible in regular clinical settings, particularly those that involve management of crises and making disposition of patients.

Thus, there appears to be a need for procedures that are clinically feasible and acceptable and that, at the same time, increase rigor in the collection of data. This need has motivated interest in the so-called semistructured interview procedures. An example of this type of evaluation procedures is the Initial Evaluation Form (Mezzich, Dow, Rich, Costello, & Himmelhoch, 1981b) developed as part of the Clinical Information System (Mezzich, Dow, & Coffman, 1981a) at the Western Psychiatric Institute and Clinic of the University of Pittsburgh. This evaluation procedure has two complementary components: one is narrative and provides flexibility for describing in natural language particular aspects of the patients condition; the other is structured and ensures that key information will be systematically assessed. The structured component includes a fixed list of items to be covered, with brief prompts for each, and specification of the ratings codes in terms of time frame. The 1982 revision includes a severity scale for symptoms present in the current episode, as well as compact diagnostic criteria checklists to be completed for diagnostic categories formulated by the clinicians at the end of the evaluation process, which document the fit between DSM-III categories and fulfilled criteria.

### *Explicit Diagnostic Criteria*

The development and use of explicit or specific diagnostic criteria represents the second major methodological development aimed at reducing undesirable

variability or unreliability in the diagnostic evaluation process. Generically, this procedure involves setting clear, denotative, and objective rules for assigning diagnostic categories to individuals under examination. The clinical information used for making these assignments may have been obtained through unstructured, semistructured, or rigidly structured interview procedures.

Some of the best known sets of explicit psychiatric diagnostic criteria are those developed by Feighner *et al.* (1972) and by the Research Diagnostic Criteria (Spitzer *et al.*, 1978), and those included in Axes I and II of DSM-III (American Psychiatric Association, 1980). These three criteria sets were developed sequentially, each building heavily on the previous one.

The Feighner *et al.* criteria were developed "for use in psychiatric research" and pioneered the design of criteria for a substantial set of diagnostic categories. The diagnostic criteria include both inclusion rules (specifying features required to be present for making the diagnosis under consideration) and exclusion rules (specifying features that rule out that diagnosis). They cover 15 diagnostic conditions that, in the opinion of the authors, had adequate evidence of clinical distinctiveness, longitudinal stability, and in some cases, high familial loading.

Building on the Feighner *et al.* criteria, Spitzer *et al.* (1978) developed the Research Diagnostic Criteria (RDC), within the framework of a collaborative project on the psychobiology of depression sponsored by the National Institute of Mental Health. The scope of psychopathology covered increased vis-à-vis that covered by the Feighner *et al.* criteria to include eight additional disorders. Additionally included are several non-mutually-exclusive ways of subtyping some of the important categories, such as major depressive disorder. The clinical information strictly required to formulate RDC diagnoses can be obtained through the previously described Schedule for Affective Disorders and Schizophrenia, which was developed for this specific purpose.

The following criteria for panic disorder illustrate the RDC approach; A through E are required for the episode of illness being considered:

A. At least 6 panic attacks, distributed over a 6 week period and occurring at times other than during marked physical exertion or a life-threatening situation, and in the absence of a medical illness that could account for symptoms of anxiety.

B. The panic attacks are manifested by discrete periods of apprehension or fearfulness with at least 3 of the following symptoms present during the majority of attacks required for definite and 2 for probable (for past episodes, because of memory difficulty, the criteria are 2 and 1 symptoms).

(1) dyspnea, (2) palpitations, (3) chest pain or discomfort, (4) choking or smothering sensations, (5) dizziness, vertigo, or feelings of unreality, (6) paresthesias (tingling), (7) sweating, (8) faintness, (9) trembling or shaking, (10) fear of dying during attack.

C. Nervousness apart from the anxiety attacks over the 6 week period.

D. The anxiety symptoms, or reactions to them are a major part of the clinical picture during some phase of the period of illness being considered.

E. The condition has resulted in either impairment in social functioning, seeking help from someone, or taking medication, or abusing alcohol or drugs.

Patients with probable or definite major depressive disorder, schizophrenia, or schizo-affective disorder who manifest recurrent anxiety attacks do not receive the additional diagnosis of panic disorder for the same period of illness if

the anxiety attacks largely overlap temporally with those of the other disorder. However, some patients may have a period of illness that meets the criteria for more than one of the following conditions: panic disorder, phobic disorder, or obsessive-compulsive disorder. In such instances, more than one diagnosis should be given.

The recently developed third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III; American Psychiatric Association, 1980) represents, in terms of explicit diagnostic criteria, one step more in the developmental line initiated by the Feighner *et al.* criteria. Most important, given that the main objective of DSM-III was to facilitate regular clinical work rather than just to identify homogeneous patient groups for research, its scope included all forms of psychopathology. This expansion in coverage involved both the consideration of a much larger set of categories than those of the RDC and the Feighner *et al.* criteria and some relaxation in the assignment rules for specific diagnostic categories.

The DSM-III diagnostic criteria for panic disorder are presented below for illustration purposes:

- A. At least three panic attacks within a three-week period in circumstances other than during marked physical exertion or in a life-threatening situation. The attacks are not precipitated only by exposure to a circumscribed phobic stimulus.
- B. Panic attacks are manifested by discrete periods of apprehension or fear, and at least four of the following symptoms appear during each attack:
  - (1) dyspnea
  - (2) palpitations
  - (3) chest pain or discomfort
  - (4) choking or smothering sensations
  - (5) dizziness, vertigo, or unsteady feelings
  - (6) feelings of unreality
  - (7) paresthesias (tingling in hands or feet)
  - (8) hot and cold flashes
  - (9) sweating
  - (10) faintness
  - (11) trembling
  - (12) fear of dying, going crazy, or doing something uncontrolled during an attack
- C. Not due to a physical disorder or another mental disorder, such as Major Depression, Somatization Disorder, or Schizophrenia.
- D. The disorder is not associated with Agoraphobia.

It can be seen that these DSM-III criteria require three panic attacks within a three-week period instead of six attacks in six weeks as the RDC does. DSM-III also requires the presence of 4 characterizing symptoms out of 12 possible symptoms, whereas RDC requires 3 out of 10 possible symptoms. RDC Criteria C and D dealing with pervasive anxiety and Criterion E dealing with resulting social functioning impairment, care-seeking behavior, and substance abuse are not included in DSM-III. Furthermore, reflecting the larger set of disorders included in DSM-III, one of the exclusion criteria for panic disorder is association with agoraphobia, given that there is a specific disorder encompassing this association.

The polydiagnostic approach should also be mentioned here. This is the

concomitant use of several diagnostic criteria sets (e.g. Feighner *et al.*, RDC, and DSM-III) when evaluating an individual. This would allow the systematic comparison of various criteria sets in terms of their relations to associated events, social functioning, and illness course and treatment (Strauss & Gift, 1977). In fact, some studies have already been reported in the literature comparing different sets of diagnostic criteria for a single category by using outcome as the external validating criterion (e.g., Brockington, Kendell, & Leff, 1978).

## THE MULTIAXIAL MODEL

In parallel to the methodological developments described in the preceding section, the traditional single-label diagnostic model has been challenged on scientific grounds (e.g., Strauss, 1973), and in contraposition, a multiaxial approach has been proposed. This model consists of the systematic formulation of the patient's condition and the etiological and associated factors in terms of several variables, aspects, or axes, which are thought to have high clinical information value and are conceptualized and rated as being quasi-independent from each other. The word *multiaxial* has become the prevalent characterizing term, although it is somewhat confusing, given its "multidimensional" connotation, whereas, in fact, as will be seen later, most of the proposals reported in the literature have a mixed categorical and dimensional structure (Mezzich, 1979, 1984).

To better understand the possibilities and problems encompassed by the multiaxial model, it seems appropriate to review next its historical roots, the specific multiaxial systems proposed in the literature, and the trends and issues in the content, organization, and scaling of diagnostic axes.

### *Historical Context of Multiaxial Diagnosis*

Although the impact of multiaxial diagnosis is relatively recent, its origins are not. The contrast between the multiaxial and the conventional uniaxial diagnostic system may be traced perhaps to the old nosological controversy reviewed by Kendell (1975, p. 60) between, on one hand, the idealized and abstract Platonic disease entity and, on the other hand, the closer-to-the-patient and therefore more "clinical" Hippocratic approach.

This contrast was revived early in this century by the argument between Émile Kraepelin, who thoroughly endorsed the disease entity model, and A. Hoche, who proposed the separation of syndrome and etiology in the diagnostic formulation. Kraepelin's position prevailed, and nothing much was heard about this issue until 1947, when Erik Essen-Möller and S. Wohlfahrt suggested the amendment of the official Swedish classification of mental disorders separating syndrome and etiology.

Increased interest in multiaxial models for psychiatric diagnosis was then prompted by various symposia on the classification of mental disorders spon-

sored by the World Health Organization and by the American Psychopathological Association. These symposia reviewed a number of fundamental methodological issues in diagnosis and also some germinal multiaxial ideas (e.g., Rutter, Lebovici, Eisenberg, Sneznevskij, Sadoun, Brooke, & Lin, 1969; Stengel, 1959; Zubin, 1961). More recently, in some way building on the diagnostic separation of syndrome and etiology put forward by Essen-Möller and Wohlfahrt (1947) and Essen-Möller (1961, 1971), a number of multiaxial models have been proposed in various parts of the world, including England (Rutter, Shaffer, & Shepherd, 1975; Wing, 1970), Germany (Helmchen, 1975; von Cranach, 1977), Japan (Kato, 1977), Sweden (Ottosson & Perris, 1973), and the United States (American Psychiatric Association, 1980; Strauss, 1975). Additionally attesting to the significance of the multiaxial model is the incorporation of a transitional form of it in the new U.S. *Diagnostic and Statistical Manual of Mental Disorders*, as well as its serious consideration for possible implementation in the future tenth revision of the *International Classification of Diseases*.

### *Conceptualization of Axial Content, Organization, and Scaling*

The axes considered in the various systems proposed in several parts of the world could be grouped, according to their content, into the following major types or themes:

1. *Phenomenology*. It includes symptomatology, personality disorder, and intellectual functioning.
2. *Etiological or associated factors*. These include axes on biological and psychosocial factors conceptualized and organized in various ways. Causation may include predisposing, precipitating, and maintaining factors.
3. *Time frame*. It includes axes dealing with onset, duration, and course of psychopathology.
4. *Social functioning*. It includes axes dealing with work performance, interpersonal relations, and other aspects of adaptive functioning.
5. *Other*. It includes psychopathological severity, certainty, and the "illness" versus "caseness" contrast. It should be noted that some axes, such as "certainty" have a "moderator" meaning rather than being conceptually independent axes.

Almost universal consensus (Kato's 1977 special system being the exception) can be noted on the inclusion of "symptomatology or syndrome" and "etiological or associated factors." The latter always included biological and psychosocial factors (as separate axes in Rutter, Shaffer, & Sturge, 1975; and in DSM-III).

Four multiaxial systems (Helmchen, 1975; Ottosson & Perris, 1973; Strauss, 1975; von Cranach, 1977) deal with "time frame of psychopathology" through axes such as "duration" and "course." A fifth system (DSM-III) uses, within Axis I (clinical psychiatric syndrome), "duration" for additionally rating schizophrenic disorders and "course" for alcohol and other drug-use disorders.

## *Number and Organization of Axes*

Decisions about the number of axes in a system entail consideration of the relative importance given to two conflicting objectives in diagnostic development. One is greater comprehensiveness and informational richness of the diagnostic formulation, which would promote the inclusion of as many axes or clinical aspects as possible. The other objective is parsimony, addressed to limiting the number of axes in order to prevent overloading the clinician cognitively when she or he is trying to conceptualize the patient's problems and make management decisions. The previously mentioned revision of the literature on multiaxial systems shows that the modal number of axes per system was five, which was the case in five systems.

In regard to their scaling, axes can be either typological or dimensional. A typological axis is structured in terms of categories that are qualitatively different from each other and that can be represented by patient clusters or groups. A common example of a typological axis is syndrome description, involving a set of states such as generalized anxiety and paranoid schizophrenia. In contrast, a dimensional axis represents continuous, ordered, quantitative variation. The mathematical scale underlying it may be either of the rank type, in which just ordinal information is considered, or of the interval type, in which information about the size of the differences between objects or points is additionally considered. Diagnoses according to a dimensional axis are made on the basis of individuals' standing on the relevant scale. Examples of dimensional axes are chronicity and level of social functioning.

In a comparison of diagnostic merits, on one hand a typological axis has the advantage of its traditional and generalized use in standard diagnostic systems such as the current edition of the *International Classification of Diseases* and the associated ample familiarity that clinicians have with such a descriptive arrangement. The predilection for the use of categorical labels may extend beyond the clinical area and may respond to deep psychological needs for simplified description, as suggested by Raven, Berlin, and Breedlove (1971). On the other hand, a dimensional axis or scale, when applicable, involves a fuller use of the available information than was accomplished by a typological scale. Besides the above considerations, the choice between a typological or a dimensional scale for assessing a particular clinical aspect may depend on the informational structure of that aspect, as determined by clinical judgment and/or data-based research. For example, the most accepted way of conceptualizing psychopathological symptomatology, as described in established textbooks and most professional journals, is in terms of syndromes or states, which are categories. Probably because of this, all multiaxial proposals reported in the literature use a typological scale for symptomatology. This does not mean, of course, that dimensional scales could not be used in complementary fashion in the future if adequate research documents their appropriateness and usefulness for at least certain psychopathological areas, such as personality disorder. Another clinical aspect is social or adaptive functioning, which has been frequently concep-

tualized in terms of its level. The two multiaxial proposals (Strauss, 1975, and DSM-III) that include this clinical aspect use dimensional axes for it.

## INTERNATIONAL CLASSIFICATION OF DISEASES (NINTH EDITION)

### *Historical Context*

In 1853, a milestone in public health took place when the International Statistical Congress requested William Farr of England and Marc d'Espine of Italy to prepare a uniform nomenclature of the causes of death applicable to all countries. After several revisions, a final version was prepared in 1891 by a committee chaired by Jacques Bertillon, chief of statistical activities of the city of Paris, and was adopted by the International Statistical Institute in 1893. This international classification of causes of death and its successor, the *International Statistical Classification of Diseases, Injuries and Causes of Death*, have since then been revised regularly at about 10-year intervals.

Each revision is expected to adopt modifications in disease classification resulting from new discoveries, correction of errors and inconsistencies, and attempts to meet the changing and expanding needs of health and social agencies, clinicians, research workers, and users of health statistics for improved classification of diseases.

The ICD is a statistical classification for the following conditions: infectious, parasitic, and noninfectious disease; complications of pregnancy, childbirth, and the puerperium; congenital abnormalities; causes of perinatal morbidity and mortality; accidents, poisonings, and violence; and symptoms, signs, and ill-defined conditions.

The ICD is organized into 17 major sections. Each of these major sections is subdivided into a defined set of categories, identified by three digits ranging from 001 to 999. Each category is divided into additional subcategories by a fourth digit (.0–0.9) The section on mental disorders of the ICD subdivides these disorders into organic conditions, psychoses, neurotic disorders, personality disorders and other nonpsychotic disorders, and mental retardation. There are two supplementary chapters: one for classification of external causes of injury and poisoning (the E code) and the other for classification of factors influencing health status and contact with health services (the V code).

### *Section on Mental Disorders*

A major innovation in ICD-9 was the incorporation of the glossary of the section of mental disorders. In addition, several new three-digit categories were added, some of them related to child and adolescent psychopathology: psychosis with origin specific to childhood; nondependent abuse of drugs; acute reaction to stress; adjustment reaction; depressive disorder, not elsewhere classified; disturbance of conduct, not elsewhere classified; disturbance of emotions specif-



ic to childhood and adolescence; hyperkinetic syndrome of childhood; specific delays in development; and psychic factors associated with diseases classified elsewhere.

Among the categories specific to childhood and adolescence, the psychoses with origin specific to childhood should be used only for psychoses that begin before puberty. This category is subdivided into infantile autism, disintegrative psychosis, other, and unspecified.

Infantile autism is a syndrome present from birth or beginning in the first 30 months. Usually, there are severe problems in the understanding of spoken language. Speech is delayed and, if it develops, is characterized by echolalia, the reversal of pronouns, immature grammatical structure, and inability to use abstract terms. There is generally an impairment in the social use of both verbal and gestural language. Problems in social relationships are most severe before the age of 5 years. Ritualistic behavior is usual and may include abnormal routines. The intelligence ranges from severely subnormal to normal or above.

In the disintegrative psychosis, the normal or near-normal development for the first few years is followed by a loss of social skills and of speech, together with a severe disorder of emotions, behavior, and relationships.

Other childhood psychoses include a variety of atypical psychoses that may show some, but not all, the features of infantile autism.

The other broad category specific to childhood and adolescence is disturbance of emotions specific to childhood and adolescence. Its manifestations are subcategorized into: with anxiety and fearfulness; with misery and unhappiness; with sensitivity, shyness, and social withdrawal; with relationship problems; other or mixed; and unspecified.

Hyperkinetic syndrome of childhood is characterized by short attention span and distractibility. In early childhood, the most striking symptom is extreme overactivity. Impulsiveness, marked mood fluctuations, and aggression are also common symptoms. This category is subdivided into a simple disturbance of activity and attention; hyperkinesis with developmental delay; hyperkinetic conduct disorder; other; and unspecified.

In the specific delays in development, this feature is the most salient. It includes specific reading retardation, specific arithmetical retardation, other specific learning difficulties, developmental speech or language disorder, specific motor retardation, mixed developmental disorder, other, and unspecified.

Another part of ICD-9 that is receiving increasing attention in the mental health field is the supplementary classification of factors influencing health status and contact with the health sources (V codes). These V codes are important in obtaining information on psychosocial and environmental factors related to the problem of psychiatric morbidity and primary health care and factors that lead a person to enter the health service system.

According to Kramer (in press) these classifications and others regarding psychosocial factors will gain importance because of the priority placed by WHO on the need for such classifications in primary health care, particularly in less developed areas of the world, and on the need for classifications for planning and evaluating the services provided.

The section on external causes of injury and poisoning (E codes) allows the classification of environmental events, circumstances, and conditions as the cause of injury, poisoning, and other adverse effects. It contains categories that are relevant to the mental health area, such as motor vehicle accidents, suicide attempts, homicide, accidental poisoning, and the utilization of psychotropic drugs, soporifics, and other drugs that affect the physiology of the central nervous system.

These two supplementary classifications are particularly relevant to children and adolescents because of their dependence on the physical and psychosocial environment.

## DSM-III

In mid-1980, the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) was published. Since then, it has attracted considerable interest, and along with a recognition of its limitations, it is being widely judged in this country and abroad as a significant step forward toward a more accurate and thorough characterization of psychiatric patients. Its most important features are the use of explicit or operational criteria for the definition of diagnostic categories and the use of a multiaxial framework. These two features, which represent some of the most important methodological developments of recent years, were discussed in preceding sections.

The multiaxial system in DSM-III includes three typological axes: (I) clinical psychiatric syndromes; (II) personality and specific developmental disorders; and (III) physical disorders. It also includes two dimensional ones: (IV) severity of psychosocial stressors and (V) highest level of adaptive functioning in the past year. A patient is diagnosed in a typological axis through the use of qualitatively distinct categories, whereas in a dimensional axis, the patient is described by the indication of his or her standing on an interval or rank scale.

### *Axis I: Clinical Psychiatric Syndromes*

Axis I of DSM-III comprises a catalog of mental disorders (other than personality and specific developmental disorders) and related conditions. Most of these disorders have explicit diagnostic criteria, one of the landmarks of DSM-III. Some overview comments on the broad categories of Axis I follow.

Reflecting an increase in interest and knowledge in child psychopathology, DSM-III contains a much expanded and differentiated set of categories for disorders usually starting in infancy, childhood or adolescence, vis-à-vis the few categories contained in DSM-II.

Organic mental disorders are divided into two parts. One includes two broad categories with specified etiology or pathophysiology: dementias arising in the senium and presenium and substance-induced organic mental disorders. The second section corresponds to organic mental disorders described in terms of behavioral syndromes, the etiology or pathophysiology of which is either noted under Axis III (physical disorders) or is unknown.

Substance use disorders cover both alcohol and other drugs. They are essentially classified as either abuse or dependence (characterized by manifestations of tolerance and/or withdrawal). Drug use syndromes newly considered in DSM-III (in contrast with DSM-II) are phencyclidine (PCP) abuse and tobacco dependence.

The schizophrenic disorders have a description tightened in comparison to that in DSM-II, including the requirement of a 6-month chronicity. The "simple" subtype of DSM-II is omitted, and schizoaffective disorders are placed outside the broad schizophrenic category.

An interesting new broad category is psychotic disorders not elsewhere classified. It includes schizophreniform disorder (having all the cross-sectional features of schizophrenia but a chronicity of less than 6 months and more than 2 weeks), brief reactive psychosis (which appears immediately following a recognizable psychosocial stressor), schizoaffective disorder (which does not have explicit diagnostic criteria and is used whenever a differentiation between affective disorder and either schizophrenic or schizophreniform disorder is not possible), and atypical psychosis (which encompasses two main meanings: a psychosis not fitting the definitions of the specified psychotic disorders or a psychosis unspecified because of inadequate information).

The section on affective disorders constitutes one of the major innovations in DSM-III. First, major affective disorders are divided principally into bipolar disorder (manic-depressed with a history of mania) and major depression (which has a quite encompassing definition and prevails over concomitant neurotic syndromes of various kinds). Other specific affective disorders (cyclothymic and dysthymic disorders) represent milder and chronic affective conditions. Atypical bipolar and depressive disorders represent unspecified or residual categories.

A number of traditional neuroses are considered next under the headings of anxiety, somatoform, and dissociative disorders.

Psychosexual disorders are much more differentiated than in DSM-II and include gender identity disorders, paraphilias, psychosexual dysfunctions, and the controversial ego-dystonic homosexuality.

Adjustment disorders represent nonpsychotic reactions to stressful situations and are classified according to the predominant affect or behavior shown.

Psychological factors affecting physical condition replace the "psychophysiological" or "psychosomatic" disorders of traditional systems. Their diagnosis involves both indicating the presence of such psychological factors in Axis I and specifying the corresponding physical conditions in Axis III.

A set of V codes is provided for conditions not attributable to a mental disorder that are nevertheless a focus of attention or treatment.

### *Axis II: Personality and Specific Developmental Disorders*

This axis tends to represent stable behavioral handicaps. However, it seems that, to do justice to this conceptualization, it should also include mental retardation.

Personality disorders in DSM-III cover most of the characterological conditions of DSM-II. Exceptions are the addition of schizotypal, avoidant, narcissistic, and borderline personality disorders; the deletion of inadequate and asthenic personality disorders; and the transfer to various Axis I sections of cyclothymic and explosive personality disorders.

Specific development disorders represent an innovation in DSM-III, reflecting the axis on developmental delays from the multiaxial system for child psychopathology developed by Rutter *et al.* (1975) under the sponsorship of the World Health Organization.

### *Axis III: Physical Disorders*

Axis III includes any current physical disorders or conditions relevant to the understanding or management of the individual. Such conditions are cataloged in the non-mental-disorder sections of the *International Classification of Diseases (ICD-9-CM)* (U.S. Center for Health Statistics, 1978).

### *Axis IV: Psychosocial Stressors*

Axis IV assesses psychosocial stressors judged to have been significant contributors to the development or exacerbation of the current disorder.

First, specific psychosocial stressors (e.g. death of sister) are to be identified and listed in order of importance. Then, the overall stressor severity is rated using the following scale.

Code	Term	Adult examples	Child or adolescent examples
1	None	No apparent psychosocial stressor	No apparent psychosocial stressor
2	Minimal	Minor violation of the law; small bank loan	Vacation with family
3	Mild	Argument with neighbor; change in work hours	Change in schoolteacher; new school year
4	Moderate	New career; death of close friend; pregnancy	Chronic parental fighting; change to new school; illness of close relative; birth of sibling
5	Severe	Serious illness in self or family; major financial loss; marital separation; birth of child	Death of peer; divorce of parents; arrest; hospitalization; persistent and harsh parental discipline
6	Extreme	Death of close relative; divorce	Death of parent or sibling; physical or sexual abuse
7	Catastrophic	Concentration camp experience; devastating natural disaster	Multiple family deaths
0	Unspecified	No information, or not applicable	No information, or not applicable

### *Axis V: Highest Level of Adaptive Functioning in the Past Year*

Axis V assesses an individual's highest level of adaptive functioning (for at least a few months) during the past year.

Adaptive functioning is conceptualized mainly as a composite of social rela-

tions (breadth and quality of interpersonal relations with family, friends, and other people) and occupational functioning (consistency and quality of performance as worker, student, or homemaker). Use of leisure time is considered accessorially:

<i>Code</i>	<i>Term</i>	<i>Description</i>
1	Superior	Unusually effective functioning in social relations, occupational functioning, and use of leisure time
2	Very good	Better than average functioning in social relations, occupational functioning, and use of leisure time
3	Good	No more than slight impairment in either social or occupational functioning
4	Fair	Moderate impairment in either social relations or occupational functioning, or some impairment in both
5	Poor	Marked impairment in either social relations or occupational functioning, or moderate impairment in both
6	Very poor	Marked impairment in both social relations and occupational functioning
7	Grossly impaired	Gross impairment in virtually all areas of functioning
0	Unspecified	

An appraisal of DSM-III as a classification of child psychiatric disorders done by experts in the field of child psychopathology seems to show some agreement among them. Its success resides in (1) its introduction of a multiaxial framework that allows assessment of multiple facets of behavior through the use of multiple axes (Achenbach, 1980; Rutter & Shaffer, 1980; Mezzich & Mezzich, 1985; Werry, 1985); (2) its provision of a more comprehensive listing of child psychiatric disorders (Achenbach, 1980; Rutter & Shaffer, 1980; Werry, 1985); (3) its specification of necessary and sufficient criteria for each diagnosis (Rutter & Shaffer, 1980; Werry, 1985); (4) the usefulness of its syndrome-descriptive information other than diagnostic criteria (e.g., associated features and differential diagnosis discussions; Mezzich & Mezzich, 1985; Werry, 1985); (5) its use of a phenomenological approach (Rutter & Shaffer, 1980); (6) its recognition of developmental factors in the manifestations of psychiatric disorders (Werry, 1985); (7) the attempt of Axis IV to recognize the importance of stress (including developmental stress) and of Axis V to recognize the level of adaptational function (Werry, 1985); (8) its addition of codings for psychosocial stressors (Rutter & Shaffer, 1980); (9) its recognition that disorders may persist in adult life (Rutter & Shaffer, 1980); and (10) the possibility of defining a problem (e.g., a parent-child problem) in terms that do not include the use of a psychiatric disorder label (Werry, 1985).

Criticisms are made regarding the following issues:

1. Its medical model. Achenbach (1980) argues that a classification of child psychopathology must embrace a wide range of adaptive and maladaptive behavior rather than limiting itself to focalized illnesses diagnosable as present or absent.
2. The proliferation of unvalidated diagnostic categories (Achenbach, 1980; Rutter & Shaffer, 1980; Werry, 1985; Werry, Methven, Fitzpatrick, & Dixon, 1983).

3. The decision not to include mental retardation on a separate axis (Rutter & Shaffer, 1980).
4. Many of the diagnostic criteria are still subjective, and there are neither prescribed nor universally accepted techniques for obtaining the necessary data (Rutter & Shaffer, 1980; Werry, 1985).
5. The principles employed on Axis IV (Rutter & Shaffer, 1980).
6. Special concerns about Axis IV, including the problematic definition of stressors *vis-à-vis* the age of the child, the pertinence of acute versus chronic stressors, and the demands on the evaluator imposed by the need to consider the sociocultural framework

A fair summary would be that DSM-III, *vis-à-vis* traditional systems, is a much more imaginative system, is more logically organized, and represents a landmark in the development of a psychiatric classification system.

## OTHER DIAGNOSTIC SYSTEMS FOR MENTAL DISORDERS IN CHILDREN AND ADOLESCENTS

Out of concern with the complexity of child psychopathology and its special developmental issues, various alternative diagnostic systems particularly pertinent to this age group have been proposed in the literature.

### *Anna Freud*

Anna Freud (1965) developed a diagnostic system based on the developmental sequence hypothesized in psychoanalytic theory. She maintained that "pure description" of a child's symptoms is useless and instead that analytic therapists should assess the child in terms of aspects such as drive; ego and superego development; degree of stability of the borders between id, ego, and superego; degree of progress from primitive, id-dominated (primary process) thinking to rational, ego-dominated (secondary process) thinking; and progress from seeking immediate gratification (pleasure principle) to delaying immediate gratification in the interest of adaptation (reality principle).

### *Group for the Advancement of Psychiatry*

Another important system is that proposed by the Committee of Child Psychiatry of the Group for the Advancement of Psychiatry (GAP; 1966). The GAP committee opted for a "clinical descriptive" system that could be used by workers from various schools of thought and that would facilitate a more uniform collection of data. The following is the list of categories considered: I. healthy responses; II. reactive disorders; III. developmental deviations; IV. psychoneurotic disorders; V. personality disorders; VI. psychotic disorders; VII. psychophysiological disorders; VIII. brain syndromes; IX. mental retardation; and X. other disorders. In searching for a theoretical framework, the committee felt that three factors were essential: (1) the psychosomatic concept; (2) the

developmental dimension; and (3) the psychosocial aspects of the child's existence in the family and society. The GAP committee attempted to make the definitions of the various categories as operational as possible. This actually varies from category to category; for example, Category IV (psychoneurotic disorders) is defined almost exclusively in inferential terms obtained from psychoanalytic theory.

### *Anthony*

Anthony (1970) proposed a comprehensive developmental schema for the description of child psychopathology. His aim was to portray disorders in terms of the psychosexual, psychosocial, psychocognitive and psychoaffective operations at work during any particular stage. As Anthony pointed out, his schema is mainly addressed to the generation of hypotheses, but it may also be a useful way of summarizing the many psychological dimensions along which development has been hypothesized to proceed and the multiplicity of factors that may be needed to form a complete picture of a child at any given age.

### *Hewitt and Jenkins*

In regard to data-based approaches to the development of diagnostic systems for children and adolescents, one of the earliest attempts was that of Hewitt and Jenkins (1946). They reviewed 500 child clinic cases, and for each, they determined the presence or absence of 94 psychopathological symptoms. The authors retained for analysis only 45 of the items, chosen on the basis of high frequency or obvious clinical importance. The intercorrelations between the 45 items were inspected to elucidate three clusters that the authors expected in advance. A symptom was regarded as belonging to a cluster if it had a correlation coefficient of at least 0.30 with most of the other symptoms in the cluster and if it fitted the clinical picture suggested by the cluster. The three symptom clusters were submitted to represent the "overinhibited child," the "unsocialized aggressive child," and the "sociological delinquent child."

### *Achenbach*

Achenbach (1966) conducted a factor analytic study of a symptom checklist of 91 items on a sample of 300 boys and 300 girls attending a psychiatric clinic who showed no evidence of organic features. Various sources in each child's record (e.g., parents, physicians, teachers, and self-reports) provided the information for scoring each symptom as present or absent. He found first a general bipolar factor for both boys and girls. The factors that had significant loadings on the positive pole of the factor were labeled "internalizing symptoms." Those with significant loadings on the negative pole of the factor were called "externalizing symptoms." Additionally, the author found 7 specific factors for boys and 11 for girls. The specific symptom factors found were (1) aggressive behavior; (2) anxiety symptoms (girls only); (3) delinquent behavior; (4) depressive

symptoms (girls only); (5) enuresis and other immaturities (girls only); (6) hyperactive behavior; (7) neurotic and delinquent behavior (girls only); (8) obesity (girls only); (9) obsessions, compulsions, and phobias; (10) schizoid thinking and behavior; (11) sexual problems (boys only); and (12) somatic complaints.

### *The Rutter System*

One of the most significant developments in the diagnosis of child and adolescent disorders, because of its international origin, its consensual base, and its innovative structure, has been the multiaxial system for these age groups born at the Fifth World Health Organization Seminar on Psychiatric Diagnosis (Rutter *et al.*, 1969). It initially included three axes: clinical psychiatric syndrome, intellectual level, and medical conditions. The triaxial system was expanded later on to include an axis on abnormal psychosocial situations (Rutter *et al.*, 1975a). Rutter *et al.* (1975b) added an axis on specific delays in development by extracting these conditions from the psychiatric syndrome axis. The description of the latter multiaxial diagnostic system follows.

*First Axis: Clinical Psychiatric Syndrome.* This axis consists of Section V of ICD-9 except that the codes for specific delays in development (315) and the codes on mental retardation (317–319) have been removed to constitute separate axes. Otherwise, the organization of codes and glossary descriptions are unchanged.

*Second Axis: Specific Delays in Development.* Categories on this axis are descriptive and not etiological.

*Third axis: Intellectual Level.* This axis presents an indication of current level of general intellectual functioning. The coding is behaviorally descriptive and carries no necessary implications concerning either etiology or prognosis.

*Fourth Axis: Medical Conditions.* This axis provides for the coding of non-psychiatric medical conditions. The coding refers to current conditions. A past history of illness or injury should not be recorded unless it is associated with a current codable condition. If a condition is present, it should be coded irrespective of whether it is thought to have caused the psychiatric disorder. It is possible to make more than one coding on the axis.

*Fifth Axis: Abnormal Psychosocial Situations.* This axis provides a means of coding current abnormal psychosocial situations. It does not include past psychosocial stresses. When an abnormal psychosocial situation is present, it should be coded regardless of whether it is thought to have caused the patient's psychiatric disorder.

The categories included on this axis are the following:

- 00 No significant distortions or inadequacy of psychosocial environment
- 01 Mental disturbance in other family members
- 02 Discordant intrafamilial relationships
- 03 Lack of warmth in intrafamilial relationships
- 04 Familial overinvolvement
- 05 Inadequate or inconsistent parental control



- 06 Inadequate social, linguistic, or perceptual stimulation
- 07 Inadequate living conditions
- 08 Inadequate or distorted intrafamilial communication
- 09 Anomalous family situation
- 10 Stresses or disturbance in school or work environment
- 11 Migration or social transplantation
- 12 Natural disaster
- 13 Other intrafamilial psychosocial stress
- 14 Other extrafamilial psychosocial stress
- 15 Persecution or adverse discrimination
- 16 Other psychosocial disturbance in society in general
- 88 Other
- 99 Not known

A review of the literature shows an increasing interest in the multi-axial model for the diagnosis of psychiatric disorders in childhood and adolescence, following the triaxial diagnostic system proposed by Rutter *et al.* in 1969.

### *Sadoun, Casadebaig, and Hatton*

An epidemiological study of the infant population at the Alfred Binet Center in Paris conducted by Sadoun, Casadebaig, and Hatton (1976) involved the use of a multi-axial diagnostic system that comprises the following axes:

*Axis I. Basic Diagnostic Class.* This axis includes a list of 12 diagnostic categories (variations of the norm, adjustment disorders, specific developmental disorders, neurotic disorders, personality disorders, psychotic disorders, disorders of the volition of the libido, psychosomatic disorders, organic brain disorders, mental retardation, conduct disorders, and other conditions). Only one category is allowed to be coded on this axis. If concomitant disorders exist, they could be coded on Axis III (associated disorders).

*Axis II. Intellectual Level.* This axis includes the coding of the IQ and the test used for its assessment.

*Axis III. Associated Disorders.* This axis allows coding of accompanying disorders such as adjustment disorders, speech and language disorders, psychomotor disorders, and psychosomatic disorders.

*Axis IV. Etiological Factors.* This axis allows the coding of information obtained during the evaluation that might have etiological significance.

### *Kreisler*

Continuing with the same interest in the psychopathology of infancy, Kreisler (1977) proposed in France a multi-axial nosological classification based on clinical manifestations and following the principles of coherence, clarity, commodity, and concordance. This classification presents the following axes:

- Axis I. Disturbances of somatic expression
- Axis II. Disturbances in development

Axis III. Disturbances of motor expressions

Axis IV. Mental expression

Axis I involves a descriptive and symptomatic statement. The other axes represent etiological and structural references.

### *Rocha*

Emphasizing the need for a "multidimensional" diagnosis to avoid the inconvenience of a "diagnostic label," Rocha (1977) proposed in Brazil a multi-axial diagnostic system for children.

The description of the four axes is as follows:

Axis I. *Pathology*. This axis includes symptoms.

Axis II. *Pathogeny*. In this axis, eight levels are described: the adaptive, the reactive, the neurotic, the psychopathic, the psychotic, the psychosomatic, the deficient, and the sociopathic.

Axis III. *Personality*. This axis describes the features that characterize the most common and constant behavior of each child. Intellectual level and age are also coded on this axis.

Axis IV. *Etiology*.

### *Spiel*

A diagnostic system described by Spiel (1981) has been used for over a decade at the Department of Child and Adolescent Neuropsychiatry, University of Vienna Medical School. The author favors a diagnostic approach that focuses on an individual's life history and takes into account developmental processes and their deviations from the norm. He argues that the medicopsychological discipline was the first to accept the principle of multietiological causation and a development-oriented interpretation of symptom phenomenology. His system is based on an essential premise, that is, that any attempt to label diseases should include three fundamental dimensions: (1) somatic; (2) psychic; and (3) social. Each of these dimensions or levels is specified by referring to dynamic processes: (1) the basic genetic and constitutional endowment of an individual; (2) the dynamic processes that manifest themselves in the course of an individual's development; and (3) acute fateful events. Further differentiation can be attempted by a quantitative weighing of the severity of each axis as (1) slight; (2) moderate; or (3) severe.

### *MAS 81*

In an attempt to obtain some experiential knowledge that could enhance the future development of ICD-10, Isager (1982) developed in Denmark the "MAS 81," a local multi-axial diagnostic system for child psychiatry inspired by Rutter *et al.*'s (1975) multi-axial system.

The MAS 81 presents the following axes:

- Axis I. *Clinical psychiatric symptomatology*. This axis includes some traditional "Scandinavian" syndromes coded on subaxis I.1 and a symptom checklist coded on subaxis I.2.
- Axis II. *Specific delays in development*.
- Axis III. *Intellectual level*. Brilliant intelligence could also be coded on this axis.
- Axis IV. *Biological circumstances*.
- Axis V. *Socioeconomic and psychosocial circumstances*. This axis includes a socioeconomic category coded on subaxis V.1 and a newly developed qualitative list of psychosocial circumstances with a glossary coded on subaxis V.2. This new list considers not only negative but also positive factors in the assessment of psychosocial circumstances.

### *Special Areas*

The multiaxial model has found useful applications not only in general psychopathological description, but also in special areas. Among the latter is the diagnosis of family dysfunction through a triaxial system developed by Tseng and McDermott (1979); the comprehensive description of mentally retarded individuals through the work of Tarjan, Tizard, Rutter *et al.* (1972); and the attempt to provide a comprehensive description of the condition of the violent delinquent adolescent in which are considered not only psychiatric disorders but also the individuals' level of intelligence, adaptive functioning, legal status, and familial background (Mezzich, 1982).

## PROSPECTIVE DIAGNOSTIC SYSTEMS

### *DSM-III-R*

A relatively moderate revision of DSM-III undertaken by the American Psychiatric Association (Spitzer & Williams, in press) involves changes in the diagnostic classes, new categories, new names for old categories, new distinctions, dropping of old distinctions, changing of concepts of certain disorders, a new approach to exclusion criteria (hierarchy), a polythetic item format for several disorders, and adjustments in the multiaxial system.

Regarding disorders usually first evident in infancy, childhood, or adolescence, the main innovation is the coding of all "development disorders" along with the personality disorders on Axis II. The developmental disorders are mental retardation, pervasive developmental disorders, and specific developmental disorders.

Mental retardation would include the same subcategories as in the current DSM-III.

The pervasive developmental disorders essentially include autistic disor-

ders, subdivided into infantile onset, childhood onset, and onset not otherwise specified. Also in this section is pervasive developmental disorder not otherwise specified.

Specific developmental disorders include the following categories:

Language and speech disorders

- 315.39 Articulation disorder
- 315.31 Expressive language disorder
- 315.31 Receptive language disorder

Academic skills disorders

- 315.00 Reading disorder
- 315.90 Expressive writing disorder
- 315.10 Arithmetic disorder

Motor skills disorders

- 315.40 Coordination disorder
- 315.90 Specific developmental disorder NOS

Other developmental disorders

The following categories of disorders usually starting in infancy, childhood, and adolescence are coded on Axis I:

Disruptive behavior disorders

- 314.01 Attention-deficit-hyperactivity disorder
  - Conduct disorder,
    - 312.20 group type
    - 312.00 solitary aggressive type
    - 312.90 undifferentiated type
  - 313.81 Oppositional defiant disorder
- Anxiety disorders of childhood or adolescence
- 309.21 Separation anxiety disorder
  - 313.21 Avoidant disorder of childhood or adolescence
  - 313.00 Overanxious disorder

Eating disorders

- 307.10 Anorexia nervosa
- 307.51 Bulimia nervosa
- 397.52 Pica
- 307.53 Rumination disorder of infancy
- 307.50 Eating disorder NOS

Gender identity disorders

- 302.60 Gender identity disorder of childhood
- 302.50 Transsexualism
- 302.89 Gender identify disorder of adolescence or adulthood, nontranssexual type
- 302.85 Gender identity disorder NOS.

Tic disorders

- 307.23 Tourette disorder
- 307.22 Chronic motor or vocal tic disorder
- 307.21 Transient tic disorder

Specify: Single episode, Recurrent

307.20 Tic disorder NOS

Disorders of elimination

307.60 Functional enuresis

307.70 Functional encopresis

Speech disorders not elsewhere classified

307.00 Cluttering

307.00 Stuttering

Other disorders of infancy, childhood, or adolescence

313.89 Reactive attachment disorders of infancy or early childhood

307.30 Stereotypy or habit disorder

313.23 Elective mutism

313.82 Identity disorder

314.00 Undifferentiated attention deficit disorder

Of course, children and adolescents can also be diagnosed on Axis I with categories outside disorders usually starting in infancy, childhood, or adolescence.

## ICD-10

The upcoming revision of the *International Classification of Diseases* involves a number of architectural changes from the current ICD-9, which are outlined by Jablensky (in press).

The main innovations proposed for the disorders with an onset in childhood or adolescence are the expansion of the number of categories included and their classification into three major groups. One of these comprises mental retardation; the second, the various developmental disorders; and the third, behavioral and emotional disorders with onset specific to childhood and adolescence. A list of the corresponding categories and subcategories included in a 1986 draft follows:

### F70–F79 MENTAL RETARDATION

F70 Mild mental retardation

F71 Moderate mental retardation

F72 Severe mental retardation

F73 Profound mental retardation

F79 Unspecified mental retardation

### F80–F89 DEVELOPMENTAL DISORDERS

F80 Specific developmental disorders of speech and language

F80.0 Simple articulation disorder

F80.1 Expressive language disorder

F80.2 Receptive language disorder

F80.4 Environmentally determined language/disorder

F80.6 Acquired aphasia with epilepsy

F80.9 Other and unspecified developmental disorders of speech and language

- F81 Specific developmental disorders of scholastic skills
  - F81.0 Specific reading disorder
  - F81.1 Specific spelling disorder
  - F81.2 Specific disorder of arithmetical skills
  - F81.3 Mixed disorder of scholastic skills
  - F81.9 Other and unspecified disorder of scholastic skills
- F82 Specific developmental disorder of motor function
- F83 Mixed specific developmental disorder
- F85 Pervasive developmental disorders
  - F85.0 Childhood autism
  - F85.1 Atypical autism
  - F85.2 Childhood disintegrative disorder
  - F85.3 Hyperkinetic disorder associated with stereotyped movements
  - F85.4 Schizoid disorder of childhood
  - F85.9 Other pervasive disorder
- F89 Developmental disorder, not otherwise specified
- F90–F99 BEHAVIORAL AND EMOTIONAL DISORDERS WITH ONSET USUALLY OCCURRING IN CHILDHOOD OR ADOLESCENCE*
- F90 Hyperkinetic disorder
  - F90.0 Simple disturbance of activity and attention
  - F90.1 Hyperkinetic conduct disorder
  - F90.9 Hyperkinetic disorder, not otherwise specified
- F91 Conduct disorder
  - F91.0 Conduct disorder confined to the family context
  - F91.1 Unsocialized conduct disorder
  - F91.2 Socialized conduct disorder
  - F91.9 Conduct disorder, not otherwise specified
- F92 Mixed disorder of conduct and emotions
  - F92.0 Depressive conduct disorder
  - F92.8 Other mixed disorder of conduct and emotions
- F93 Emotional disorder with onset specific to childhood
  - F93.0 Separation anxiety disorder
  - F93.1 Phobic disorder of childhood
  - F93.2 Social sensitivity disorder
  - F93.3 Sibling rivalry disorder
  - F93.8 Other emotional disorder
  - F93.9 Emotional disorder, not otherwise specified
- F94 Disorders of social functioning with onset specific to childhood or adolescence
  - F94.0 Elective mutism
  - F94.1 Reactive attachment disorder of childhood
  - F94.2 Attachment disorder of childhood, disinhibition type
  - F94.8 Other disorder of social functioning
  - F94.9 Unspecified disorder of social functioning
- F95 Tic disorders
  - F95.0 Transient tic disorder
  - F95.1 Chronic motor or vocal tic disorder

- F95.2 Combined vocal and multiple motor tics (Tourette syndrome)
- F95.9 Tic disorder, not otherwise specified
- F98 Other behavioral and emotional disorders with onset usually occurring during childhood
  - F98.0 Enuresis
  - F98.1 Encopresis
  - F98.2 Eating disorder (other than pica)
  - F98.3 Pica
  - F98.4 Sleep disorder in infancy and childhood
  - F98.5 Stereotype movement disorder
  - F98.6 Stuttering (stammering)
  - F98.7 Cluttering
  - F98.8 Hypersomnolence and megaphagia (Kleine-Levin syndrome)
- F99 Unspecified behavioral or emotional disorder with onset in childhood or adolescence

In addition to the above-listed disorders usually starting in childhood or adolescence, categories in other sections of the catalog of mental disorders may be used to diagnose both children and adults.

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## II Methods of Assessment

# 4 Standardized and Projective Tests

THOMAS M. DiLORENZO

Using tests in the interests of children requires knowing why we are testing and what we want to know. The problem is to ask the right questions about the right construct and, of course, to make the proper inferences from what we observe on tests. (Scarr, 1981, p. 1160)

As each chapter of this book has been designed to provide specific information regarding assessment devices that could or would be used for the diagnosis and evaluation of treatment effectiveness, this chapter will not address the issue of what standardized tests may be used in the assessment of specific disorders. Rather, this chapter has been designed to present a critical view of the use of standardized tests to diagnose childhood psychopathology and to aid in the evaluation of treatment effectiveness.

The traditional approach to the assessment of childhood psychopathology used test batteries (Mash & Terdal, 1981). For each child, a standard evaluation would have been conducted that included several standardized tests. Recently, this type of method (i.e., standardized batteries) to assess childhood problems has been criticized by a variety of professionals (Santostefano, 1978). The conceptual adequacy, utility, and cost efficiency of such an approach has not been demonstrated (Mash & Terdal, 1981).

Mash and Terdal (1981) further asserted that

the multiple purposes for which assessments with children are carried out suggest that all children should not be assessed in all possible ways and, therefore, that there is a need for identifying those factors that go into determining which method of assessment should be used [such as] the nature of the target behavior (e.g., overt versus covert, chronic versus acute), characteristics of the child (e.g., age, cognitive and language skills) and of significant others (e.g., social class and education), the assessment setting (e.g., classroom, home, or institution), characteristics of the assessor (e.g., level of training and available time), characteristics of the method (e.g., complexity and amount of technical resources or training required, sensitivity to treatment), and assessment purpose. (p. 42)

Therefore, standardized tests should be used not exclusively to diagnose childhood psychopathological disorders but as adjuncts in the assessment pro-

cess to answer specific questions. (The use of standardized tests to evaluate the effectiveness of treatment will be discussed later.)

A final point regarding the declining use of standardized tests in the assessment of psychopathology is the more recent changing view of clinical psychology and clinical psychologists in particular. In the past, the standardized tests discussed in this chapter were viewed as tools of the clinical psychologist especially when he or she was regarded as a tester (see Korchin & Schulberg, 1981, for a discussion of this issue). As clinical psychologists shed this perception and became more involved in treatment and treatment evaluation, the standardized tests and standardized clinical assessment procedures were emphasized less, especially with the emergence of behavior therapy with children. The practicing clinician must be aware of the controversies and limitations of standardized tests in diagnosis and treatment evaluation, and the present chapter should take on meaning as a critical but practical view of these tests.

Before beginning the chapter, a few remarks are in order regarding several general controversial issues about the use of standardized tests, and specifically intelligence tests, with children (Carroll, 1982; Estes, 1982; Scarr, 1981). First, a long-standing debate continues to the present day regarding the influence of genetic and environmental determinants on measured mental abilities. Carroll (1982) noted that, although the estimates of the heritability of intelligence generally range from about 40% to Jensen's (1972) and Eysenck's (1973) figure of 80%, Kamin (1974) has suggested that heritability of intelligence does not exist. Researchers and clinicians have taken sides regarding this volatile issue, and those individuals administering the tests should at least be aware of how their interpretations of test data will be received.

Second, mental testing has been fiercely criticized (Putnam, 1973) as being racist, elitist, and politically motivated. Although these types of issues are quite controversial, they point to the importance of public concern with testing and raise relevant issues regarding the necessity of clearly specifying the needs and goals of any testing that is performed with children.

## USES OF STANDARDIZED TESTS

The material in this book has been designed to include information on assessment techniques and methodologies used in the diagnosis and treatment evaluation of childhood psychopathology. Therefore, this discussion of the uses of standardized tests will be limited to these two purposes. The use of standardized tests to diagnose childhood psychopathology will be presented first.

### *Diagnosis*

Probably the most controversial area in the assessment and treatment of disturbed children has been the use of diagnostic labels based upon global classification systems. . . . Criticisms of existent systems for the classification and labeling of children have been directed at the etiological assumptions upon which they are based, their

unreliability with respect to both test-retest and interrater agreement, lack of demonstrated validity, lack of utility with respect to prognosis and treatment, and general abuses and misuses related to the potentially iatrogenic effects associated with the assignment of labels. (Mash & Terdal, 1981, pp. 18–19)

However, there is still a pervasive use of diagnostic labeling of children. This section takes a critical view of the usefulness of standardized testing in this process.

Specific diagnoses must be tied to some reference point. In this chapter, reference is made to the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) developed by the American Psychiatric Association (1980). The DSM-III pays special attention to the classification of psychopathology in children and adolescents (Kazdin, 1983; Taylor, 1983; Weiner, 1982). According to the DSM-III, five major groups of disorders have been outlined as those that arise or are first evident in infancy, childhood, or adolescence. These disorders are intellectual (e.g., mental retardation), behavioral (e.g., conduct disorder), emotional (e.g., anxiety disorder), physical (e.g., eating disorder), and developmental (e.g., reading disorder) (Kazdin, 1983). Approximately 45 different diagnoses may first become evident in the developmental years (Weiner, 1982). In addition to these categories, affective disorders and schizophrenia have the same essential features in both child and adult populations and therefore are also included in this discussion as possible childhood disorders.

The major childhood psychopathological disorders are listed in Table 1. The testing requirements associated with each disorder that are specified by the diagnostic criteria in DSM-III are also listed in Table 1. The reader should note that the necessity of scores or interpretations from standardized tests in the diagnosis of childhood disorders is listed in the diagnostic criteria of only two major categories (i.e., mental retardation and specific developmental disorders). (The specific tests used for these two diagnoses will be reviewed later.) Of these two categories, specific developmental disorders are to be listed on Axis 2. These disorders (e.g., reading, arithmetic, and language delays) have been typically regarded as special problems within an educational arena and should not be regarded as mental disorders (Kazdin, 1983). In addition, the listing of mental retardation on Axis 1 as a clinical syndrome has come into question lately. The most appropriate place for this diagnosis may also be on Axis 2.

Therefore, results from standardized tests are not listed in the criteria for diagnosing the vast majority of psychopathological disorders of children. To perform standardized tests to aid in diagnosis would appear, from this analysis, to be unnecessary and unwarranted. A second use for standardized tests would be to aid in treatment considerations and/or evaluations. The next section addresses these issues.

### *Treatment Considerations and/or Evaluation*

The use of standardized tests may prove useful in both treatment considerations and treatment evaluations. Treatment considerations, in the present case, refer to the decisionmaking processes of selecting certain individuals, based on

TABLE 1. DSM-III Categories for Psychopathological Disorders of Children and Related Testing Requirements Based on the Diagnostic Criteria

Code	Disorder	Standardized tests			
		IQ	Achievement tests	Special abilities	Projective tests
317.0x	Mild MR	X	—	—	—
318.0x	Moderate MR	X	—	—	—
318.1x	Severe MR	X	—	—	—
318.2x	Profound MR	X	—	—	—
314.xx	Attention deficits	—	—	—	—
312.xx	Conduct disorders	—	—	—	—
309.21, 313.xx	Anxiety disorders	—	—	—	—
313.xx	Other	—	—	—	—
307.10, 307.5x	Eating disorders	—	—	—	—
307.2x, 307.30	Stereotyped movements	—	—	—	—
307.00, 307.60, 307.70, 307.4x	Other disorders with physical manifestations	—	—	—	—
299.xx	Pervasive developmental disorders	—	—	—	—
315.xx	Specific developmental disorders	X	X	X	—
302.xx	Gender identity	—	—	—	—
295.xx	Schizophrenic disorders	—	—	—	—
296.xx, 300.40, 301.40	Affective disorders	—	—	—	—

scores obtained on certain tests (e.g., an IQ score of 45 would place the individual in the moderate range of mental retardation), for specialized treatment (e.g., a program designed specifically for moderately mentally retarded individuals). Especially within an educational context, standardized tests may prove most useful in determining (in)competence on specific tasks if specialized programs are available for students. This last point is critical. Students should not be routinely tested unless programs are available to help in either remediation or enhancement. Likewise, tests should be geared toward assessing the specific areas in need of training within the specialized programs. Scarr (1981) has suggested that it is appropriate for educational institutions to assess and match children and curricula and that tests can help this matching process.

Treatment evaluation is the process of specifying assessments or tests to be used as dependent variables to assess the impact of an intervention or an independent variable. Standardized tests could be used as one means of obtaining relevant information regarding the problem behavior selected for treatment or remediation. However, the practicing clinician must not put the cart before the horse. Standardized tests should be regarded as tools that may prove helpful in determining deficits in areas that are previously targeted as potential problems. However, the importance of performing a functional analysis before the initiation of a specified treatment or treatment design cannot be overemphasized. A functional analysis is a thorough assessment of the problem behavior and its

interrelationship with the variables that control its emission. This functional analysis would tie the assessment procedure directly to specific treatment implications rather than attempting to administer some test first (before a thorough understanding of the problem and the related issues has been assessed) and then trying to plug in the results in some *post hoc* manner. Effective interventions rely on a comprehensive analysis of the functional relationships among behaviors in child–environment interactions. Without this process, treatments are too often adopted uncritically (Phillips & Ray, 1980).

When developing a treatment plan, which presupposes the necessity of treatment evaluation, several steps should be followed in the functional analysis. First, the problem must be specified and the behavior of interest must be defined. Second, the variables that control the problem behavior must be identified (Schreibman & Koegel, 1981). Third, Schreibman and Koegel (1981) suggested grouping the behaviors according to common controlling variables. In this way, as in every functional assessment performed, the treatment is specified automatically (Matson & DiLorenzo, 1984). Fourth, a procedure should be selected that will manipulate the controlling variables most efficaciously to change the behavior in a desirable and predictable direction (Schreibman & Koegel, 1981). Throughout this process, data or assessments must be collected to determine whether treatment goals are being met (Mash & Terdal, 1981). If specific standardized tests meet the needs and requirements of the treatment plan, they should be included in the evaluation process.

### *Summary*

Gelfand and Hartmann (1984) stated that the three functions of data collection (of which, in a traditional sense, standardized testing is an example) are (1) to diagnose; (2) to identify controlling variables to aid in designing an effective intervention; and (3) to evaluate treatment. In the preceding sections, two of these three functions were discussed. However, an argument could be made that to evaluate treatment effectively, one would need to be wholly aware of the third function (i.e., treatment design). It is interesting that Gelfand and Hartmann (1984) discussed the use of interviews and observational methodologies to collect data for the above purposes. They continued by outlining the steps to be followed in developing an effective method of data collection:

1. Define the target behavior(s) in a way suitable for measurement.
2. Develop a measurement procedure.
3. Select settings for observation.
4. Schedule observations.
5. Assess reliability and observer bias. (p. 39)

Gelfand and Hartmann's book (1984) presents material on the assessment and treatment of childhood problems and disorders through the use of child behavior therapy, and yet, no mention is made of the usefulness or appropriateness of standardized tests. As mentioned earlier, there are appropriate uses for standardized tests; however, special care should be taken in the selection and use of these tests, so that the user is accountable for his or her actions. The following

sections present information that the tester can use to make these informed decisions.

## SPECIFIC TESTS

As mentioned in the preceding sections, some standardized tests may be useful either in diagnosis or in the evaluation of treatment procedures used in childhood psychopathology. However, the usefulness of assessment batteries has been seriously questioned, and therefore, specific tests must be evaluated individually for their usefulness on the individual child basis. The following sections provide information on the usefulness of intelligence, achievement, special abilities, and projective tests in diagnosing childhood psychopathology or in evaluating treatment procedures.

### *Intelligence Tests*

Issues related to the psychometric rigor of intelligence tests used with children (i.e., reliability, validity, standardization, stability, and factor structure; Ciminero & Drabman, 1977) are not discussed here. It would appear to be sufficient to note that the most commonly used intelligence tests, discussed below, are relatively reliable instruments, for which norms have been established, and in which validity issues have been addressed in a psychometrically sound manner (Anastasi, 1982; Sattler, 1974; Wade & Baker, 1977).

Anastasi (1982) viewed a clinical approach to testing as the use of a test or tests as representing one of several sources of data. She noted that taking IQ test scores at face value in classifying children may lead to incorrect conclusions and should not be done without supplementary observations and background information. Rather, the use of intelligence testing as a measure of the child's adaptive behavior in the school or in the student role (Anastasi, 1982) in combination with other information provides an assessment of competence (Scarr, 1981; Sundberg, Snowden, & Reynolds, 1978) that is quite useful. The assessment of competence focuses on the knowledge, skills, and attitudes that the child uses to function effectively in specified environments and situations (Anastasi, 1982; Kaufman, 1979).

The most well-known and frequently used intelligence tests with children include the Stanford-Binet Intelligence Scale, the Wechsler Intelligence Scale for Children—Revised, and the Wechsler Preschool and Primary Scale of Intelligence (Brown & McGuire, 1976; Lubin, Wallis, & Paine, 1971). Other less known intelligence tests include the Peabody Picture Vocabulary Test, the Quick Test, the Pictorial Test of Intelligence, the Columbia Mental Maturity Scale, and the Slosson Intelligence Test. Sattler (1974) noted that, although there are a number of drawbacks to these tests, they are still useful, in conjunction with additional information, with a variety of populations.

Several of the well-known tests will be described briefly. The Stanford-Binet Intelligence Test can be administered to individuals between the ages of 2 and



18. The various tests are grouped into these age levels, although from age 2 to age 5 the tests are grouped into half-year intervals (Anastasi, 1982). These half-year intervals have been developed because a child progresses quite rapidly, developmentally, at the early ages. The test includes both verbal and performance items, although it has been regarded as being heavily weighted in verbal items.

The Wechsler Preschool and Primary Scale of Intelligence (WPPSI) has been designed to be administered to children between the ages of 4 and 6½. Of the 11 subtests, 10 are used to produce an IQ score: (1) information; (2) vocabulary; (3) picture completion; (4) arithmetic; (5) mazes; (6) similarities; (7) comprehension; (8) block design; (9) animal house; (10) geometric design; and (11) sentences (supplementary test).

The Wechsler Intelligence Scale for Children—Revised (WISC-R) has been designed to be administered to children between the ages of 6 and 16-11. Of the 12 subtests, 10 are used to derive an IQ score. The animal house, sentences, and geometric design subtests from the WPPSI are replaced with digit span, picture arrangement, object assembly, and coding.

The Stanford-Binet is recommended for use with individuals who have extreme IQs (i.e., very low or very high) and young children. The WISC-R is recommended for use with children above second grade. The WISC-R is easier and less time-consuming than the Stanford-Binet, and the scores obtained on the subtests can aid in treatment recommendations (see below).

### *Strengths*

Kaufman (1979) observed that “the IQ does not reflect a global summation of the brain’s capabilities and is certainly not an index of genetic potential, but it does predict school achievement effectively” (p. 9). This finding is probably due to the overlap between tasks requested on intelligence tests and to specific scholastic aptitudes that are taught in an educational setting (e.g., reading and arithmetic).

More specific to the present discussion, Nelson (1980) presented five possible uses of intelligence tests that may provide information related to diagnosis and treatment considerations or evaluation.

First, the use of IQ scores would help to enhance communication between researchers and clinicians about the specific individual’s or population’s academic repertoire. This information would help others to assess the effects of experimental manipulations based on the subjects’ original strengths and weaknesses.

Second, IQ scores could be used as screening devices to target children with specific academic deficits, so that they could be placed in the educational settings most conducive to remediating their particular deficits. For example, a child with a particular deficit that was observed through the use of an IQ test might be placed in a special education class specifically designed to meet his or her needs.

Third, the test format may provide a guide to a hierarchy of skills that may

be taught in an educational program. A child who did not complete items in a hierarchy that are age-appropriate according to normative data could begin an educational program at his or her present level and advance, in order, to those tasks that are age-appropriate.

Fourth, IQ scores could be used as dependent measures for training programs. Because IQ tests have been standardized on large groups of children, a natural norm group exists by which to evaluate changes based on a particular intervention. Standardized dependent measures provide some evidence of social validity (Kazdin, 1977) that dependent measures, specifically designed for the one study, do not.

Finally, the use of IQ tests can aid in examining the child's test performance for the purpose of developing an individualized educational plan (Ferinden & Jacobson, 1969; Ferinden, Jacobson, & Kovalinsky, 1970). Not only are the responses to specific items obtained from the testing situation, but the tester also obtains information regarding test-taking behavior (e.g., attending, persevering, and following instructions).

### *Weaknesses*

Sattler (1974) urged testers to remember that intelligence is not a thing and that intelligence tests do not measure something innate or predetermined: "Rather, intelligence tests can be thought of as samples of learning based on general experiences. The score reflects the richness of the milieu in which the child functions and the extent to which he has been able to profit from his milieu" (p. 22). Given the importance of the environment, it should be noted that a number of situational factors significantly affect IQ scores, including expectancy effects, the examiner's experience, the perceived warmth of the subject, race and/or sex differences between examiner and child, and specific examiner characteristics (Nelson, 1980; Sattler, 1974).

There are also other problems with intelligence tests. Different scores may be obtained when different intelligence tests are used with the same individual, and scores from tests administered before the age of 4–5 years do not predict well to scores obtained at later ages (Nelson, 1980). Probably the most significant problem is the variability of test scores based on the amount and form of tangible and social reinforcement that is available during the testing situation (Ayllon & Kelly, 1972; Clingman & Fowler, 1976; Edlund, 1972; Saigh & Payne, 1979; Smeets & Striefel, 1975; Willis & Shibata, 1978; Young, Bradley-Johnson, & Johnson, 1982).

Based on these limitations, we should probably view IQ tests as a method of providing a sample of academic behavior in a standardized situation (Nelson, 1980). The greatest diagnostic help would probably be in separating normal children from mentally retarded children. However, the mental retardation diagnosis is only a description of present behavior (Sattler, 1974) that begins the assessment process. As most mentally retarded children (85%) are diagnosed in the mild mental retardation category with no known organic etiologies (Sattler,

1974), the process of assessing adaptive behavior becomes the most pressing issue, in which intelligence tests are of little help.

### *Achievement Tests*

As mentioned earlier, achievement tests, like all standardized tests, are of little use in the diagnosis of most forms of child psychopathology listed in DSM-III. However, achievement tests are very helpful and would be considered the assessment method of choice when assessing specific developmental disorders that are labeled on Axis II.

Achievement tests are designed to assess past learning and learning that has occurred through specific training or educational programs (Weiner & Stewart, 1984). They are usually administered in a package of tests that assess a variety of different academic subjects. Profiles are generated either on individual subjects or on more broadly defined academic subjects. Some tests focus on specific skills, such as reading, and others focus on knowledge of facts or content of various forms of classwork (Weiner & Stewart, 1984). Finally, some tests are typically used as screening devices, whereas others are more comprehensive in format.

The two tests listed in Table 2 as screening devices are the Wide Range Achievement Test (WRAT) and the Peabody Individual Achievement Test (PIAT). These tests have been designed as rapid screening instruments that cover a wide range of competence and are applicable from preschool to the adult level (Anastasi, 1982). For example, the WRAT consists of three subtests that assess the basic areas of reading, spelling, and arithmetic. The raw scores are converted into grade ratings that can be compared with the child's present grade level.

A number of the most popular achievement tests used as screening devices and batteries are listed in Table 2. However, the reader should be aware that there are many other forms and types of achievement tests. Some tests are designed to assess specific populations (e.g., autistic children), whereas others are designed to tap specific skills (e.g., reading). (Anastasi, 1982, should be consulted for a more detailed list of tests and reliability and validity issues.)

The most common form of achievement test is the teacher-constructed classroom test (Anastasi, 1982; Weiner & Stewart, 1984). Although this form of test may be the most useful in terms of following student progress through specific coursework, it will not be discussed here because it is not a standardized test.

### *Strengths*

As mentioned earlier, the obvious diagnostic strength of achievement tests is the assessment of Axis II developmental disorders. Also, achievement tests are useful in treatment evaluation in two ways. First, specific gains due to an educational program may be assessed in a pre/post fashion. This approach is quite commonplace in educational institutions. Second, a child's level of

TABLE 2. Achievement Tests and Batteries and Related Grade Norms

Achievement test	Grade												
	K	1	2	3	4	5	6	7	8	9	10	11	12
	Screening												
Peabody Individual Achievement Test (PIAT)	X	X	X	X	X	X	X	X	X	X	X	X	X
Wide Range Achievement Test (WRAT)	X	X	X	X	X	X	X	X	X	X	X	X	X
	Batteries												
California Achievement Tests	X	X	X	X	X	X	X	X	X	X	X	X	X
Iowa Tests of Basic Skills	X	X	X	X	X	X	X	X	X	X			
Iowa Tests of Educational Development										X	X	X	X
Metropolitan Achievement Tests Survey Battery	X	X	X	X	X	X	X	X	X	X	X	X	X
SRA Achievement Series	X	X	X	X	X	X	X	X	X	X	X	X	X
Sequential Tests of Educational Progress—Step III and CIRCUS Series	X	X	X	X	X	X	X	X	X	X	X	X	X
Stanford Early School Achievement Tests (SESAT)	X	X											
Stanford Achievement Test		X	X	X	X	X	X	X	X	X			
Stanford Test of Academic Skills (TASK)									X	X	X	X	X

achievement in specific subjects can be evaluated against his or her norm group. For example, Meier (1971) indicated that, by the third grade, 10% of all children of normal intelligence are reading at least one grade level below average. This type of deficit may be detected through the use of achievement tests, and efforts to remediate may be initiated.

### *Weaknesses*

Once again, in the interest of maintaining the specific goals of this chapter, important issues are not addressed that are normally discussed regarding some forms of psychopathology of childhood. These are assessment issues related to learning disabilities, minimal brain dysfunction, and emotional disturbances (see the following references for good reviews: Barkley, 1981; Lahey, Vosk, & Habif, 1981; MacMillan & Morrison, 1979; Rose, Koorland, & Epstein, 1982; Werry, 1979). Although these terms are hopelessly vague, are difficult to define, and also are not included in DSM-III, Werry (1979) feels that the concepts of these syndromes will survive and are therefore worthy of study.

MacMillan and Morrison (1979) noted that psychopathologically disordered children have multiple problems that include educational deficits as well as social deficits. These children are in need of special education for both of these problem areas. By simply addressing achievement tests in this section, educational issues have been considered to the exclusion of social issues. And without noting some of the labels that are typically used for children, such as learning disabled, a weakness in this discussion might involve the narrowness of looking at achievement tests alone, out of the context of the total environment of the psychopathologically disordered child.

### *Special Abilities Tests*

The focus of abilities tests is on the present, that is, on the person's current level of skills, knowledge, or learning (Weiner & Stewart, 1984). Although abilities tests are similar to achievement tests in terms of focusing on learning as a result of experience, achievement tests typically tap into learning that is assumed to have occurred in a relatively specific content, such as in a classroom or training program (Weiner & Stewart, 1984).

Generally, additional information is requested concerning specific abilities after an intelligence test is administered that would lead someone to request a specific abilities tests: "It is the focus on the overall IQ score and not on the assessment of relative strengths and weaknesses in specific abilities that separates IQ from specific ability assessment" (Weiner & Stewart, 1984, p. 118). A prime characteristic of abilities tests is the fullness and depth of their coverage of a given specific ability (e.g., vision, hearing, motor dexterity, and creativity) (Weiner & Stewart, 1984).

Specific abilities tests include the Differential Aptitude Test (DAT), the Primary Mental Abilities Test (PMA), and the General Aptitudes Test Battery (GATB). Tests vary in their specific purposes (e.g., educational counseling, vocational counseling, and vocational placement).

The DAT is probably the most widely used ability test. The eight individual tests are verbal reasoning, numerical ability, abstract reasoning, clerical speed and accuracy, mechanical reasoning, space relations, spelling, and language usage. As can be seen from this list, a variety of abilities are assessed that are not tested on an intelligence test. Normative, reliability, and validity data are available.

### *Strengths*

Again, based on DSM-III, special abilities tests would be of limited use in the diagnosis of psychopathologically disordered children. However, they may be helpful in sifting through some of the specific or pervasive developmental disorders to arrive at a reasonable diagnosis after being supplied with a general intelligence test.

Similarly to the achievement tests, the abilities tests could be used to assess

changes in a treatment or educational program in a pre/post format. Also, gains could be evaluated against the child's normative group.

### *Weaknesses*

The same weaknesses that were noted for achievement tests are also apparent with these tests. In general, much of the work on defining specific abilities was done to assess the predictive validity of the tests in terms of high school achievement in both academic and vocational programs in the interest of better forms of educational vocational counseling. These issues are not particularly relevant to this chapter's discussion.

### *Projective Personality Tests*

The use of projective personality tests has been a hotly disputed topic for many years (Weiner & Stewart, 1984). Although a great deal of research has been conducted on projective techniques in the past, the use of these tests has declined steadily over the past 10–15 years (Korchin & Schuldberg, 1981). The controversies would fill volumes and are beyond the scope of this chapter. Therefore, a brief overview of the purposes of projective tests and a description of the most well-known tests is provided, with some strengths and weaknesses of projectives delineated at the end.

A variety of assessment methods or tests have been designed in accordance with various personality theories. Projective tests have been derived from the psychoanalytic model of personality, in which projection is defined as a primary defense mechanism against anxiety (Weiner & Stewart, 1984).

Defensive projection, or the externalization of impulses unacceptable to the ego, is held to occur because conscious recognition of these impulses is painful to the ego. Projection has been viewed as a defense mechanism that operates unconsciously so that one's own emotionally unacceptable impulses are unconsciously rejected and attributed to others. (O'Leary & Johnson, 1979, p. 214)

Within this theoretical framework, when a situation is too anxiety-provoking, the individual may unconsciously project her or his negative feelings onto a less threatening object or person. In the case of projective tests, the object is an inkblot, an ambiguous scene, a blank sheet of paper, or an incomplete sentence (Weiner & Stewart, 1984).

The most well-known projective tests include the Rorschach Inkblot Test, the Thematic Apperception Test (TAT), the Children's Apperception Test (CAT), the Rotter Incomplete Sentences Blank, the Draw-A-Man Test, and the Draw-A-Person Test. The Rorschach Inkblot Test is comprised of 10 inkblot designs; five in black-and-white and five in full or partial color. The cards are presented in a specified order, and the client is asked to report whatever he or she sees in the blot (Weiner & Stewart, 1984). The results may be interpreted through the assessor's clinical judgment or may be scored according to one of several standardized systems before interpretation is made.

The TAT and the CAT are projective tests made up of a number of pictorial

scenes (the TAT has people in the scenes, whereas the CAT has animals), and the client is asked to construct a story about each. Here, too, responses may be scored according to a standard system or may be interpreted by the individual assessor. The Rotter Incomplete Sentences Blank is one of the most popular of the completion techniques. The client is asked to complete a series of incomplete sentences (Weiner & Stewart, 1984), such as "Most of the time I feel . . ." The Draw-A-Man Test and the Draw-A-Person Test are known as expressive techniques. The client is asked to draw a picture of a person on a blank sheet of paper. In all of these techniques, by analyzing responses to these ambiguous stimuli, the clinician is said to be able to learn about the client's underlying motivations, conflicts, needs, or other personality dynamics (Weiner & Stewart, 1984)

### *Strengths*

Because of the weaknesses presented below, the use of projective techniques cannot be recommended strongly for use in diagnosis of or treatment evaluation in childhood psychopathology. However, Korchin and Schuldberg (1981) recommended that test responses may be used as samples of behavior rather than signs of inner processes. Also, Anastasi (1982) noted that projectives may serve the function of "breaking the ice" in initial meetings to build rapport. Finally, O'Leary and Johnson (1979) observed that using projective tests

May give the very young child an easy means of communicating with the examiner and give the examiner some idea of how age-appropriate the child is with regard to specific fantasies and the ability to meet and relate to a strange adult. Still, one cannot conclude from a child's responses to projective material that the kinds of events that go on in his/her fantasies necessarily go on in his/her real world. (p. 239)

### *Weaknesses*

There are many weaknesses in the use of projective techniques (Mischel, 1968). Anastasi (1982) noted that projective tests are inadequately standardized with respect to both administration and scoring, and that there is a serious lack of objectivity in scoring. She noted that

perhaps the most disturbing implication is that the interpretation of scores is often as projective for the examiner as the test stimuli are for the examinee. In other words, the final interpretation of projective test responses may reveal more about the theoretical orientation, favorite hypotheses, and personality idiosyncrasies of the examiner than it does about the examinee's personality dynamics. (p. 582)

Also, normative data are either completely lacking, are grossly inadequate, or are based on vaguely described populations. Several forms of reliability have been quite poor and "the large majority of published validation studies on projective techniques are inconclusive because of procedural deficiencies in either experimental controls or statistical analysis, or both" (Anastasi, 1982, p. 585).

To summarize with the words of experts in the field,

besides their questionable theoretical rationale, projective techniques are clearly found wanting when evaluated in accordance with test standards. This [conclusion] is evident from the data summarized . . . with regard to standardization of administration and scoring procedures, adequacy of norms, reliability, and validity. The accumulation of published studies that have "failed" to demonstrate any validity for such projective techniques as the Rorschach and the D-A-P is truly impressive. (Anastasi, 1982, p. 589)

And finally, "the data are simply not compelling enough to suggest that projective methods be used for clinical purposes" (O'Leary & Johnson, 1979, p. 218).

## CONCLUSIONS

This chapter was designed to assess critically the use of standardized tests to diagnose childhood psychopathology and to evaluate treatment. Intelligence tests, achievement tests, special abilities tests, and projective personality tests were described, with special reference made to particular strengths and weaknesses of each as related to the specific goals of the book.

Intelligence tests are necessary in the diagnosis of mental retardation, whereas achievement tests and ability tests are useful in the diagnosis of specific developmental disorders (i.e., according to the diagnostic criteria specified by DSM-III). These two diagnoses (i.e., mental retardation and specific developmental disorders) required standardized testing as part of the diagnostic criteria. No other diagnoses have such a requirement.

Specification was made about how intelligence, achievement, and ability tests could be used in the evaluation of treatment. However, the specification of problem behaviors and their controlling variables would probably be more useful in the evaluation of the treatment or the educational program that has been designed for the individual child.

It was pointed out that projective tests are lacking in both psychometric rigor and a theoretical rationale to be used in clinical work. Therefore, they are not recommended as tools to be used in the diagnosis or treatment evaluation of childhood psychopathology.

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# 5 Questionnaires and Checklists

STEVEN BECK

Assessment instruments that are completed by adults in reference to a child's behavior can be used by clinicians to assess children's behavioral problems and psychological characteristics. Surveys of clinicians from different therapeutic orientations indicate that rating scales and checklists are helpful in their clinical practice (Piotrowski & Keller, 1984; Wade & Baker, 1977). Yet, in a survey of child clinical and school psychologists' assessment methods for children with hyperactive characteristics, interviews, behavioral observations, standardized IQ tests, and drawing tasks were preferred over checklists (Rosenberg & Beck, 1986). As discussed throughout this book, one assessment method should not be considered superior and used independently of other assessment strategies. Yet, given the attractive features of checklists, it is surprising that these instruments are not used more extensively by clinicians. Checklists have also often been ignored in previous discussions of child behavior assessment (Wilson & Prentice-Dunn, 1981).

Rating scales or checklists completed by adults assessing a child's behavior are practical, given that adults serve as the initial primary informant, as children rarely seek or initiate treatment on their own. Parents or other authorized adults, such as teachers, are typically better able than the child to articulate their perceptions of the child's problems. Besides, a parent's or teacher's perceptions of the problems are critical for the clinician because they may have a profound effect on the child's behavior and may affect the manner in which the adult interacts with the child (Achenbach & Edelbrock, 1978). Checklists completed by an adult are usually easy to administer, can encompass a wide range of items quickly, and refer to global child characteristics (e.g., "My child is crabby most of the time") or focus on specific behaviors (e.g., "My child wiggles while watching TV").

One explanation of why checklists are not used extensively by clinicians is that these instruments are perceived as providing information that is too global (Mash & Terdal, 1981). Professionals prefer other assessment instruments, notably interviews and observations that allow for flexibility and rely more on subjective impressions to identify specific child behavior problems (Rosenberg & Beck, 1986). Yet, regardless of the methods used to assess a particular child, the assessment process can be conceptualized as a funnel, first identifying broad areas of concern (e.g., "The child is aggressive with peers"), and then narrow-

ing questions and hypotheses concerning the antecedents and consequences of identified problems (e.g., "What seems to provoke the child to become verbally or physically aggressive with neighborhood children?") (Cone & Hawkins, 1977). Checklists are ideal for quickly identifying broad areas of problem behavior and can ensure that significant areas not covered in an interview or other assessment formats will not be excluded. Another advantage of checklists is that they provide quantifiable as compared to subjective or narrative types of information.

Before discussing specific checklists, it is important to recognize that good assessment instruments must be reliable and accurate, characteristics that are usually referred to as the *psychometric properties* of an instrument. One type of reliability is the degree to which an instrument is consistent or stable over repeated testing (test-retest reliability). Another form of reliability addresses how consistently the components of an instrument measure the same construct (internal consistency). Simply put, if an instrument is to be clinically useful, it must be consistent; otherwise, changes in a score over time may reflect fluctuations in the instrument and not in the child's behavior.

Accuracy, commonly called *validity*, refers to the ability of a rating scale to measure what it intends to measure. O'Leary and Johnson (1979) stated that four types of validity should be demonstrated in good assessment instruments. First, an instrument should demonstrate predictive validity (sometimes called *criterion-related validity*), which reflects the degree to which scores on an instrument accurately predict future performance on some relevant outcome or criterion measure. For example, a checklist would have good predictive validity if high scores on a conduct problem scale in elementary school correlated with later adjustment problems, such as delinquent behavior in junior high school. The second type of validity, concurrent validity, is the relationship between scores on an instrument and those on another relevant measure obtained at approximately the same time. For example, a checklist would have good concurrent validity if ratings of a child's behavior by a parent coincided with a teacher's rating of the child in the classroom. The third type of validity is content validity, which has to do with how well items on the instrument adequately measure what the investigator intends to measure. For example, do the items measure the domain of interest? Content validity is often confused with face validity (Sattler, 1982). *Face validity* refers to what the instrument *appears* to measure, whereas *content validity* refers to whether the instrument actually measures what it intends to measure. The fourth kind of validity, and the most elusive, is called *construct validity*, which is the extent to which an instrument measures a theoretical construct or trait (e.g., conduct disorder). Construct validity is established by correlating test scores derived from a particular scale or instrument with those on other tests designed to measure the same construct.

Reliability and validity are obtained by correlational analysis. Consequently, reliabilities and validities can range from .00 (no reliability or validity) to 1.00 (perfect reliability and validity). Scores vary considerably depending on what type of reliability or validity is being measured, although a general rule is that correlations between .30 and .50 are considered moderately low, correlations

between .50 and .70 are considered moderately high, and correlations above .70 are viewed as very good.

Finally, the provision of normative data is an important feature for a checklist (Ciminero & Drabman, 1977). Ideally, normative data should include large groups of children that are representative of clinical and nonclinical populations. Also, the norm groups should match as closely as possible on important characteristics such as age, sex, grade level, race, and socioeconomic class. The larger the number of subjects in the norm group (at least 100 subjects for each age or grade level), the more stable and representative the sample. Without normative references, raw scores from an instrument for a given child are virtually meaningless unless comparisons can be made to raw scores collected from a representative sample of similar children.

The purpose of this chapter is to familiarize the reader with several diverse rating scales and checklists that are frequently used to screen children from infancy to adolescence. For the purposes of this chapter and to clarify potentially confusing terminology, all of the instruments discussed in this section will be referred to as *checklists*. The common function of these checklists is that they are completed by an adult in reference to a child's behavior or characteristics. Children's self-report measures will be briefly discussed at the conclusion of the chapter.

## CHECKLISTS

### *Personality Inventory for Children*

The Personality Inventory for Children (PIC) is a 600-item true-false questionnaire designed to assess childhood psychopathology. The inventory is completed by an adult informant (usually the mother) who is well acquainted with the target child. The PIC is probably one of the better developed and respected rating scales for assessing behaviorally and emotionally disturbed children and adolescents. The most recent PIC was published in 1977 (Wirt, Lachar, Kline-dinst, & Seat, 1977) and was developed at the University of Minnesota. Not surprisingly, the original authors used the general methodological approach employed by Hathaway and McKinley (1951) in developing the Minnesota Multiphasic Personality Inventory (MMPI). Consequently, the PIC is often referred to as the childhood equivalent of the MMPI (Barkley, 1981). Separate norms and profiles are available for males and females for ages 3–5 and 6–16. A manual providing *t*-score conversions similar to those for the MMPI, as well as interpretations of the profiles is published by Western Psychological Services (Wirt *et al.*, 1977).

The decisions about which possible dimensions of personality to assess and what specific items to include in the PIC were based on an empirical and a rational-content strategy. The empirical approach involves discriminating responses from "normal" children and adolescents compared to responses from "abnormal" groups. Two validity scales, the F and Defensiveness Scale, and five

clinical scales (Achievement, Intellectual Screening, Delinquency, Psychosis, and Hyperactivity) were derived by means of an empirical construction strategy. The remaining scales were constructed from clinicians' judgments of what content items are clinically relevant. One validity scale and seven clinical scales (Development, Somatic Concern, Depression, Family Relations, Withdrawal, Anxiety, and Social Skills) were developed by means of the rational-content strategy. Generally speaking, the rational-content scales are useful in conveying information about specific areas of parental concern, and the empirical scales aid professionals in identifying clinical syndromes.

The original norms for the PIC were collected from a large sample ( $N = 2,390$ ) of mostly Minneapolis Public School children and were administered to an equal number of boys and girls at each age level from 5½ to 16½. Several hundred additional cases were collected for 2½- to 5½-year old children. The normative sample had a good distribution of economic, social, and educational backgrounds at each of the children's age levels. A number of reliability and validity studies have been conducted by Wirt and his colleagues. Test-retest reliability in a clinical sample has been shown to be extremely stable, achieving a mean correlation of .89, with only one scale, Somatic Concerns, obtaining a test-retest correlation below .80 over an average of 15 days (Wirt & Lachar, 1981). The PIC manual documents good differentiation of clinical groups from the normative sample for the scales Adjustment, Intellectual, Screening, Delinquency, Psychosis, and Hyperactivity. Gdowski (1977) reported that the 12 clinical scales, with the exception of Somatic Concerns, were able to differentiate groups of emotionally and behaviorally disturbed children and adolescents.

Lachar, Gdowski, and Snyder (1982) recently examined over 1,200 behaviorally disturbed children and adolescents and derived four broad-based scales from factor analysis of 313 inventory items comparing the 12 consecutive clinical profile scales (Achievement through Social Skills). The newly formed scales are called Underdisciplined/Poor Self-Control, Social Incompetence, Internalization/Somatic Concerns, and Cognitive Development. These scales demonstrated good internal consistency ranging from .81 to .92, and test-retest reliability coefficients across three samples of children and adolescents were .82 to .92. These four scales demonstrated good discriminant abilities by successfully distinguishing on the four factor scales samples of delinquent, hyperactive, cerebral dysfunction, somaticizing, mentally retarded, and psychotic children. In an effort to expand the predictive validity of the four broad-based factors and 16 profile scales, Lacher, Gdowski, and Snyder (1984) examined 691 children and 293 adolescents referred to a psychological clinic. An empirically derived scale of problem behaviors (Lachar & Gdowski, 1979) was completed by the child's closest relative at home, by school personnel, and finally by a psychiatric resident or psychology intern. The results provide evidence of convergent and discriminant validity for both the broad-band factor scales and the more narrow-band scales.

The PIC appears to be a promising inventory for identifying empirically derived, reliable, and externally validated measures of psychopathology. In the revised PIC administration booklet, scores from the four broad-band factor

scales can be derived from the first 131 inventory items (Lachar, 1982). Lachar *et al.* (1984) suggested that clinicians interested in giving the PIC as a screening measure administer the first 131 items that assess broad dimensions of psychopathology, and if any factor scale is significantly elevated, the respondent may then complete the additional items to obtain the standardized profile scales and critical items.

The PIC, like any other inventory, is not without disadvantages. The use of the entire 600 items results in an extremely long scale and may take an informant well over an hour to complete. PIC items were written to be understood by parents with reading ability purportedly at or above fifth-grade level (Wirt & Lachar, 1981). However, recent readability analysis found that a more conservative estimate is that a mid-sixth-grade reading level is required to answer PIC items (Barad & Hughes, 1984). This fact may exclude some parents from completing the inventory, particularly parents with less education. Finally, as with most checklists, the PIC fails to assess situational variables that are important in deriving treatment plans for behaviorally disordered children and adolescents and their parents.

### *Child Behavior Checklist*

The Child Behavior Checklist (CBCL) (Achenbach, 1966, 1978; Achenbach & Edelbrock, 1979, 1983) records in a standardized format the behavioral problems and competencies of children aged 4–16, as reported by a child's parents or others who know the child well. The CBCL is unique because it reflects adaptive competencies as well as behavior problems and has separate norms for boys and girls at ages 4–5, 6–11, and 12–16. These age ranges were chosen because the authors believe that children make important transitions in cognitive, physical, educational, and/or social-emotional development during these age periods (Achenbach & Edelbrock, 1983). The CBCL contains 118 behaviors and uses a weighted scoring with a three-step response (e.g., "not true," "somewhat or sometimes true," and "very often true") for each item. Twenty items assess the child's social competency. The CBCL takes approximately 17 minutes to complete, although some parents can complete the checklist in 10 minutes. The CBCL purportedly requires a fifth-grade reading level.

Data obtained from the checklist are entered on the Child Behavior Profile, which displays the items reported by parents, as well as the child's standing on narrow and broad syndromes. The scales on the Child Behavior Profile were constructed from analysis of parent's ratings of 2,300 clinic-referred children from various public and private mental health centers and 1,300 nonreferred children from randomly selected homes in the Washington, D.C., area. The racial composition of the clinic and nonclinic children averaged 80% white, 18% black, and approximately 2% other. The informants provided adequate representation of lower-, middle-, and upper-socioeconomic-status (SES) categories according to Hollingshead's scale (1957) for parents' occupations.

The CBCL was originally constructed by Achenbach in 1966 from a survey of existing literature and case histories of 1,000 child psychiatric patients (Achen-

bach, 1966). Items have been further refined and now provide broad coverage of behavior problems that can be rated with a minimum of inference. Standardization of scores from the CBCL for the Child Behavior Profile for boys aged 6–11 were reported in 1978 (Achenbach, 1978), followed by the construction of norms for boys aged 12–16 and girls aged 6–11 and 12–16 in 1979 (Achenbach & Edelbrock, 1979). More recently, Achenbach and Edelbrock (1983) reported standardization for boys and girls aged 4–5.

Achenbach and Edelbrock are two well-known researchers who have been involved in classifying child psychopathology based on empirical approaches (Achenbach & Edelbrock, 1978). In fact, it was the lack of a satisfactory taxonomy of childhood disorders that prompted these investigators to further develop the CBCL and the Child Behavior Profile.

Based on factor analyses, data from the Child Behavior Profile for each sex and age range show that the behavior problem scales can be divided into two broad-band groupings, labeled *externalizing* and *internalizing*, and several narrow-band syndromes of behavioral problems for each sex and age groupings. Narrow-band syndromes identified from the CBCL are found in Table 1. As noted by Achenbach and Edelbrock (1983), the names selected for the behavioral scales are somewhat arbitrary and subject to criticism, but categorical labels are unavoidable and are necessary for communication among professionals. However, no scale is directly equivalent to any clinical diagnosis and should not be used for conferring a diagnostic label, even though some scales are similar to traditional diagnostic categories.

The CBCL social competence items consist of an Activities scale that assesses the extent of the child's participation in sports, nonsports hobbies, activities and games, and jobs and chores. The Social scale consists of scores for the child's membership and participation in organizations, the number of friends and contacts with them, and behavior with others and alone. The final competence scale, the School scale, consists of the child's average performance in academic subjects, placement in a regular or a special class, being promoted regularly or held back, and the presence or absence of school problems. Although normed separately for each of the age groups, the Activities and Social scales are scored in the same way for all groups. The School scale is scored only for children of school age.

To facilitate comparisons of how a child's problems and competencies compare with those of children of similar age and sex, raw scores are converted to T-scores for each narrow-band syndrome and can be plotted on the Child Behavior Profile. The T-scores of the Child Behavior Profile are based on the percentile of the distribution of raw scores. This procedure makes it easy for clinicians to compare a child's score on each scale with scores obtained by the normative sample. In addition, T-scores have a mean of 50 and a standard deviation of 10, and these normalized scores are provided on the Child Behavior Profile for statistical and research purposes. The Profile approach allows for a multidimensional analysis of a child's particular problems and competencies and preserves more information than does classification into mutually exclusive categories.



TABLE 1. Behavior Problem Scales Identified on the Child Behavior Checklist

Group	Internalizing syndromes	Mixed syndromes	Externalizing syndromes
Boys aged 4-5	Depressed Immature Social withdrawal Somatic complaints	Sex problems	Aggressive Delinquent Schizoid
Girls aged 4-5	Depressed Schizoid or anxious Social withdrawal Somatic complaints	Obese	Aggressive Hyperactive Sex problems
Boys aged 6-11	Depressed Obsessive-compulsive Schizoid or anxious Somatic complaints Uncommunicative	Social withdrawal	Aggressive Hyperactive Delinquent
Girls aged 6-11	Depressed Schizoid-obsessive Social withdrawal Somatic complaints		Aggressive Cruel Delinquent Hyperactive Sex problems
Boys aged 12-16	Immature Obsessive-compulsive Schizoid Somatic complaints Uncommunicative	Hostile withdrawal	Aggressive Delinquent Hyperactive
Girls aged 12-16	Anxious-obsessive Depressed withdrawal Schizoid Somatic complaints	Hyperactive Immature	Aggressive Cruel Delinquent

The test-retest reliability of scale scores for each sex and age group at one-week intervals is very good. Correlations range from .62 for the Depressed scale for boys aged 4-5 to .97 for the Delinquent scale for boys aged 12-16 at one-week intervals. The median  $r$  is .89 for all scales for a one-week test-retest reliability. Test-retest correlations for children in inpatient settings over a 3-month period average .74 for parent's ratings and .73 for child-care workers' ratings of behavioral problems. Test-retest correlations for outpatients' scores over a 6-month period were in the .60s for both behavior problems and competence scores. Interestingly, moderately high (.66) agreements between mothers' and fathers' scale scores have been reported. Achenbach and Edelbrock (1983) suggested that, as scores obtained from respective parents do not differ much on the average, major disagreements found between ratings by the mother and the father of a child are likely to be clinically important and should be further explored. Content, criterion-related, and construct validity studies have been conducted on the CBCL and the Child Behavior Profile and are favorable. Comparisons of clinical and nonclinical samples generally show differences on all social competence and behavior problem scores for each sex and age grouping.

### *Teacher's Report Form*

Edelbrock and Achenbach (1984) also developed a teacher version of the Child Behavior Profile for boys aged 6–11. They argued that, although parents' perceptions of their children are obviously important, teachers are usually the second most important adults in children's lives and provide several unique perspectives on children's functioning. Next to parents, teachers have more contacts with school-aged children than most other adults. Teachers also observe and interact with children in a somewhat standardized social environment that allows direct comparisons among children of the same developmental level. Similarly, teachers are in an excellent position to observe children's social skills and peer relationships. Finally, teachers have the opportunity to observe children's responses to tasks that require sustained attention, persistence, and organization.

The teacher profile is scored from the Teacher's Report Form (TRF), a behavior checklist similar to the parent's CBCL, designed to obtain teachers' reports of children's problem behaviors, school performance, and adaptive functioning. The Behavior Problem Scales of the Teacher Profile were derived by factor-analyzing TRFs filled out by teachers of 450 boys referred to various mental health facilities throughout the country. Norms for the Teacher Profile were computed from TRFs of 300 nonreferred boys, 50 at each age from 6 to 11. The TRF is similar in some ways to the parent version of the CBCL. The TRF includes 118 specific behavior problems and is scored on the same three-step response ("not true," "somewhat or sometimes true," and "very often true"). Teachers rate current performance on academic subjects on a 5-point scale ranging from 1 ("far below grade") to 5 ("far above grade"). The TRF also includes four questions regarding adaptive behavioral functioning that are rated on 7-point scales ranging from 1 ("much less") to 7 ("much more"). The exact wording is as follows: "Compared to typical pupils of the same age: How hard is this child working? How appropriately is the child behaving? How much is the child learning? How happy is the child?" Spaces are also provided for reporting recent achievement test scores and results of IQ, readiness, or aptitude tests, as well as for the teacher's comments about the pupil's work, behavior, and potential. The entire form can be filled out by most teachers in 15 minutes.

Factor analysis of the TRFs completed on the 450 clinically referred boys yielded eight behavior problem syndromes labeled Anxious, Social Withdrawal, Unpopular, Self-Destructive, Obsessive-Compulsive, Inattentive, Nervous-Overactive, and Aggressive. The first two syndromes form the second-order factor Internalizing, and the last three syndromes formed an Externalizing second-order factor. Compared to the 300 nonreferred boys, clinic-referred boys scored significantly higher on all Behavior Problem Scales and significantly lower on teacher-reported school performance and adaptive functioning. One-week test-retest reliability averaged .89 for the behavior problems scales, and 2-month and 4-month test-retest reliabilities averaged .77 and .74, respectively.

The CBCL is already widely respected and is likely to become the checklist with which other similar instruments are compared, given its emphasis on the

empirical classification of behavioral problems, its large clinical and nonclinical norms broken down by sex at three different age groups, and the attention given to children's social competencies. The CBCL is likely to become a standard assessment instrument in child clinical settings (McMahon, 1984). A manual providing detailed information about the CBCL, the revised Child Behavior Profile, and related material can be obtained by writing to Thomas Achenbach, Department of Psychiatry, University of Vermont, South Prospect Street, Burlington, Vermont 05401.

### *Revised Behavior Problem Checklist*

Perhaps the most extensively used checklist in clinical research has been the Behavior Problem Checklist developed by Herbert Quay and Donald Peterson in 1967. The original checklist has been used in more than 100 published studies in educational, mental health, pediatric, and correctional settings. In 1983, the checklist was revised (Quay & Peterson, 1983), although the basic characteristics of the Revised Behavior Problem Checklist (RBPC) are very similar to those of the original Behavior Problem Checklist, as the primary intention of the revision was to improve the psychometric properties of the instrument. The items on the RBPC are generally clearly written and require minimal inference, and the checklist includes only items that are typically representative of clinical samples, so that items pertaining to enuresis, thumb sucking, or such somatic complaints as headaches and stomachaches are not included.

The RBPC contains 89 items and uses a weighted scoring with a three-step response for each item ("does not constitute a problem," "constitutes a mild problem," and "constitutes a severe problem"). Factor analysis of the RBPC revealed four major subscales (Conduct Disorder, Socialized Aggression, Attention Problem-Immaturity, and Anxiety-Withdrawal) and two minor scales (Psychotic Behavior and Motor Excess). The RBPC is applicable to children as young as 5 years old and has been used with young adults in their early 20s. Currently, normative data are available from teacher ratings for only 65 males and 81 females from Grades 9 thru 12. There are also preliminary data available for mothers' ratings of 248 normal children, ages 5-16 (Quay & Peterson, 1984). These data, however, constitute samples of convenience and do not represent truly random normal children and adolescents.

Data for the factor analysis were obtained from four separate samples representing a broad range of clinical problems. In total, 760 children and adolescents representing an array of clinical problems have been rated on the RBPC. The sample is not uniformly distributed, as males are overrepresented and upper-socioeconomic-status families are underrepresented. These clinical samples do show that the basic properties of the original Behavior Problem Checklist have been preserved. Based on the interim manual published by Quay and Peterson (1983), the Conduct Disorder subscale represents the dimension of aggressive, noncompliant, quarrelsome, interpersonally alienated, acting-out behavior. Socialized Aggression represents a dimension of acting-out, externalizing behavior, although this subscale represents a more socialized form of delinquency,

such as whether the child or adolescent is susceptible to peer influence and is capable of forming strong bonds with peers.

The Attention Problem-Immaturity scale reflects problems in concentration, perseverance, impulsivity, and direction following, which lead to difficulties at both home and school. This scale seems to be measuring characteristics of what is now called an "attention deficit disorder" in the DSM-III (American Psychiatric Association, 1980). Anxiety-Withdrawal represents the internalizing dimension of anxiety, depression, fear of failure, social inferiority, and self-concern. This dimension appears to reflect subject distress. The Psychotic Behavior scale is comprised both of items that are clearly related to overt psychosis, such as delusions, and of items related to language dysfunctions, such as "parroting" other speech. Quay and Peterson noted that this scale should be interpreted with caution, and that high scores represent a need for further assessment. The Motor Excess subscale involves both gross motor behaviors ("always on the go") and motoric tension ("nervous, jittery, easily startled"). Quay and Peterson noted that the presence of these characteristics does not necessarily imply the presence of clinical problems, as children and adolescents who are rambunctious or very active may have high scores on this subscale.

Preliminary reports of the internal consistency of and interrater agreement on the RBPC are fair to good. Test-retest reliability of 141 children rated by their teachers in Grades 1-6 at a 2-month interval were .63 for Conduct Disorder, .49 for Socialized Aggression, .83 for Attention Problem-Immaturity, .79 for Anxiety-Withdrawal, .61 for Psychotic Behavior, and .68 for Motor Excess. These coefficients may be slightly lower than those obtained with parent ratings on the previously discussed Child Behavior Checklist, as the RBPC represents teacher ratings on classroom behavior over two months that may have involved some "settling in" on the part of the children and an increasing tolerance by teachers of deviancy. The RBPC has demonstrated discriminant validity between 99 clinic-referred and over 600 non-clinic-referred 6- to 12-year-old children. For both boys and girls, differences between the two samples on the subscales are statistically significant. For boys, the RBPC correctly classified 80% of all the cases as belonging to either the clinical or the normal group.

The RBPC is new, and validation of this instrument will be an ongoing endeavor. At the time of this writing, large representative samples of parents' or teachers' ratings of both clinical and normal male and female children and adolescents at each grade level were not available. *T* scores for normal and clinical cases by sex and age were also not available. The RBPC also contains 12 items that do not reflect part of the six subscales and are currently not scored, but that have been retained for additional research that is now under way to extend the RBPC downward to age 2. Given the present development of the RBPC, Quay and Peterson suggested that an obtained score of at least two standard deviations higher than the mean for each subscale is to be clinically meaningful. However, until more representative samples of clinic- and non-clinic-referred children and adolescents are available, the RBPC should probably not be used for screening or classifying children and adolescents, although this instrument can be used for measuring behavior change over time or change associated with

psychological interventions. A kit that includes the Interim Manual, the 1984 appendix, copies of the RBPC, and a scoring stencil can be obtained from Herbert C. Quay, Ph.D., Box 248074, University of Miami, Coral Gables, Florida 33124.

### *The Devereux Scales*

The Devereux Foundation, which administers residential and day treatment centers for emotionally disturbed and mentally retarded children and adolescents, publishes three rating scales, the Devereux Child Behavior Rating Scale (DCB), the Devereux Adolescent Behavior Rating Scale (DAB), and the Devereux Elementary School Behavior Rating Scale II (DESB-II).

#### *Devereux Child Behavior Rating Scale*

The DCB is a 97-item questionnaire that the instructions state can be filled out by any individual who has lived with the targeted child for a short period of time. The DCB was designed to be used with children between the ages of 6 and 12, although most of the research data have been collected with children between the ages of 8 and 12. All three Devereux scales have a profile on the last page of their respective forms that can be detached to become part of the identified child's or adolescent's record. The profile on all three scales allows the rated child or adolescent to be compared to a normal and clinical group. The profile shows the range of raw scores from plus to minus one standard deviation from the mean score for a clinical and normal group for each behavior factor. Thus, the rater can visually graph and compare the child's or adolescent's score to that of a normal or clinical group.

The DCB differs from other behavioral rating scales in that the DCB is divided into six sections that have the rater evaluate the child using different criteria in each section. For example, Items 1 to 45 rate overt behaviors and give a weighted score from 5 ("very frequently") to 1 ("never occurs"), and the instructions ask, "Compared to normal children, how often does the child . . . ?". This question raises problems because the scale assumes that the rater has knowledge of the targeted child compared to "normal" children on such items as "Seeks out adults for attention" or "expresses anger." Each section uses different weights. For example, one section, which asks the rater to score a child on "Compared to normal children his age, to what degree is the child . . . ?", is weighted from 8 ("extremely"), 7 ("markedly"), 6 ("distinctly"), 5 ("quite a bit"), 4 ("moderately"), 3 ("a little"), 2 ("very slightly"), and 1 ("not at all"). The scale assumes that raters can make such fine discriminations using a reference group of "normal" children. The DCB was published in 1966 (Spivack & Spotts, 1966) and does not provide the objectivity and minimal inference found in the more recent rating scales. The DCB instructions to raters show its age by instructing raters to avoid interpretations of the child's "unconscious" motives and feelings and to answer each item "quickly," assuming that items rated quickly are more valid than those given reflective thought.

TABLE 2. Scales Identified on the Three Devereux Rating Scales

DCB factors <sup>a</sup>	DAB factors <sup>b</sup>	DESB-II factors <sup>c</sup>
Distractability	Unethical	Work Organization
Poor Self-Care	Defiant/Resistive	Creative
		Initiative/Involvement
Pathological Use of Senses	Domineering Sadistic	Positive toward Teacher
Emotional Detachment	Heterosexual Interest	Need for Direction in Work
Social Isolation	Hyperactivity Expansive	Socially Withdrawn
Poor Coordination and Body Tones	Poor Emotional Control	Failure Anxiety
Incontinence	Needs Approval Dependency	Impatience
Messiness, Sloppiness	Emotional Distance	Irrelevant Thinking/Talk
Inadequate Need for Independence	Physical Inferiority Timidity	Blaming
Unresponsive to Stimulation	Schizoid Withdrawal	Negative/Aggression
Proneness to Emotional Upset	Bizarre Speech and Cognition	Perseverance
Need for Adult Contact	Bizarre Action	Peer Cooperation
Anxious-Fearful Ideation	Inability to Delay	Confusion
“Impulse” Ideation	Paranoid Thinking	Inattentive
Inability to Delay	Anxious Self-Blame	Achievement Compared to Average Child
Social Aggression		Achievement Compared to Ownself
Unethical Behavior		

<sup>a</sup>DCB = Devereux Child Behavior Rating Scale  
<sup>b</sup>DAB = Devereux Adolescent Behavior Rating Scale  
<sup>c</sup>DESB-II = Devereux Elementary School Behavior Rating Scale II

The DCB identifies 17 behavior factors that are listed in Table 2. These factors have been derived from a combination of factor-analysis procedures and clinical judgment. Normative data are available from three samples of children: 348 normal children from public schools, 252 clinical children from four residential treatment centers, and 100 developmentally delayed children from the same residential centers. The normative groups are not a truly representative sample of clinical and normal children and appear to be more of a sample of convenience, primarily children from the Devereux residential centers. In addition, the age levels and sex differences are not equally represented in the normative samples.

One-week, one-month, and six-month test–retest reliabilities of the DCB on all 17 behavior factors for children in a residential treatment center were .90, .85, and .60, respectively, all within the acceptable range. If one analyzes each behavior factor individually, the DCB shows moderate discriminative validity on only 5 of the 17 scales: Distractability, Emotional Detachment, Incontinence, Anxious-Fearful Ideation, and Inability to Delay differentiate the emotionally disturbed children from the mentally retarded children. The DCB appears to better discriminate the emotionally disturbed children from the normal sample, as 9 of the 17 behavior factors differentiate these two groups, whereas only 6 behavior factors differentiate the retarded children from the normal group.

*Devereux Adolescent Behavior Rating Scale*

The Devereux Adolescent Behavior Rating Scale (DAB) is an 84-item checklist that was designed to describe problem behaviors of adolescents between 13 and 18 years of age (Spivack, Haimes, & Spotts, 1967). Similar to the DCB, the DAB is broken into two sections and uses ratings requiring fine discrimination from 8 ("extremely") to 1 ("not at all") for one section. The rater is also asked to assess the targeted adolescent compared to "normal" adolescents on the first 57 items. Table 2 lists the 15 factors identified in the DAB. Normative data for the DAB appear to be more comprehensive than those reported for the DCB, as the DAB provides clinical norms for 407 institutionalized adolescents and breaks down this sample into nine diagnostic groups. However, as these norms were published in 1967, some of the diagnostic terms are outdated and are no longer commonly used. Norms are also provided for 141 mentally retarded adolescents and for two normal groups: 92 children living in a residential setting and 305 children living at home.

One-week test-retest reliability of the DAB for 189 adolescents in a residential treatment center shows a median correlation of .82, with a range of .53 for Hyperactivity Expansive to .91 for Schizoid Withdrawal. Calculation of rater agreement on the same adolescents by two independent raters resulted in a median score of .90 for normal adolescents and .81 for emotionally disturbed adolescents. For each of the nine diagnostic groups, the DAB averages six behavior factors that statistically differentiate the clinical groups from the two normal groups. Surprisingly, the mean scores of the mentally retarded group of adolescents are not statistically different from those of the two normal groups on any of the 15 behavior scales, a finding suggesting that the DAB has rather poor discriminative abilities or is not tapping problems associated with mental retardation.

*Devereux Elementary School Behavior Rating Scale II*

The Devereux Elementary School Behavior Rating Scale II (DESB-II) is a checklist pertaining to classroom behaviors that is to be completed by a teacher who is familiar with the targeted child. In 1967, the original DESB was anchored to achievement-related classroom behavior. The DESB-II was revised in 1982 and is designed to be used with children in kindergarten through sixth grade (Swift, 1982). Similarly to the DCB and DAB, the 52-item rating scale can be criticized because instructions ask the teacher to compare the targeted child to the "average" child in a normal classroom situation and uses different weighted scores in different sections of the scale. The DESB-II identifies 10 behavior factors, 4 behavior clusters, and 2 estimations of overall achievement, labeled "achieving compared to the average child" and "achieving considering the child's own ability" (see Table 2).

Normative data for the DESB-II have been collected from 72 teachers rating 708 children in 13 elementary schools in small city public schools. The normative data show that the mean scores on all the factors are stable across grades. Data

from 49 teachers rating 178 children in special-education classes in 21 schools represent low-achieving children. The DESB-II does discriminate fairly well between children in the regular classroom and children in the special-education classes on all of the factors except two: Creative Initiative/Involvement and Positive toward Teacher. Correlations between factor scores and tests measuring academic achievement, such as the California Achievement Test (CAT) and teacher grades, are generally in the direction supporting the achievement relevance of the factor scores. The DESB-II is a well-known and frequently used checklist. As an example, school psychologists endorsed the DESB-II as the most preferred checklist for assessing suspected hyperactive characteristics in elementary-age children (Rosenberg & Beck, 1986). Further information about these three rating scales can be obtained by writing to the Department of Publication, The Devereux Foundation, Devon, Pennsylvania 19333.

### *Louisville Behavior Checklist*

The Louisville Behavior Checklist (LBC) is an inventory filled out by parents that focuses on their child's social and emotional behavior problems (Miller, 1967b). There are three different LBC checklists: Form E1 for children aged 4–6, Form E2 for ages 7–12, and Form E3 for ages 13–17. All three checklists contain 164 items, and Forms E1 and E2 have almost identical items, whereas many of the items in Form E3 differ from those in the other two checklists. Items are written to be understood by persons who have at least a sixth-grade education; consequently, some parents may not be able to complete the checklist, or items will have to be read to them. Items on all three checklists are written to be answered either true or false by the child's parent. Perhaps the major criticism of this otherwise sound inventory is that parents are forced to make binary decisions, that is, to indicate if their child does or does not exhibit a certain behavior, when, in fact, decisions regarding the frequency and intensity of certain behaviors often require qualifiers so that judgments can be placed along a Likert-type scale.

Twenty scales have been constructed from Form E1, and nineteen almost identical scales comprise Form E2 (see Table 3). The first 11 scales were derived using factor analysis, and the remaining 8 scales were derived from the clinical literature on children. Thirteen scales have been constructed from Form E3, the first nine of which are factor scales (Miller, 1980).

Templates are available for hand scoring the three forms. Once raw scores have been obtained, standard scores can be found in conversion tables in the LBC manual (Miller, 1981). The LBC was the first checklist for which standard scores were developed. The LBC has very good male and female norms for normal and clinical groups, although Form E3 now provides only clinical norms. The LBC also has a profile form that allows for visual screening of a child's standard scores on all the scales.

General population norms for 287 children aged 4–6 are thoroughly described in the LBC manual. Demographic characteristics of the standardization sample compared to 1970 U.S. Census data are presented. These norms appear



TABLE 3. Scales Identified on the Louisville Behavior Checklist

Forms E1 and E2—Children aged 4–6 and 7–12	Form E3—Adolescents aged 13–17
Infantile Aggression	Egocentric-Exploitive
Hyperactivity	Destructive-Assaultive
Antisocial Behavior	Social Delinquency
Aggression	Adolescent Turmoil
Social Withdrawal	Apathetic Isolation
Sensitivity	Neuroticism
Fear	Dependent-Inhibited
Inhibition	Academic Disability
Intellectual Deficit <sup>a</sup>	Neurological or Psychotic Abnormality
Immaturity	General Pathology
Cognitive Disability <sup>b</sup>	Longitudinal Scale
Normal Irritability	Severity Level
Rare Deviance	Total Pathology
Neurotic Behavior	
Psychotic Behavior	
Somatic Behavior	
Social Behavior	
School Disturbance Predictor	
Severity Level	

<sup>a</sup>This is labeled Academic Disability on Form E2

<sup>b</sup>This is labeled Learning Disability on Form E2

to be a representative sample of the general population, as the demographic characteristics closely approximate the Census data. Family income and the child's intelligence are inversely related to deviant behavior, but the age and sex of the child have little effect on the scale scores for 4- to 6-year-old children. Race differences appeared on some of the scales, with blacks reporting more deviant behaviors.

For Form E2, Miller, Hampe, Barrett, and Noble (1972) provided general population norms for 226 children aged 7–12. Again, this sample is noteworthy, as Miller and his colleagues allowed comparison of their sample to 1970 Census data. Demographic information provided in the LBC manual includes race, sex, religious affiliations, socioeconomic status, intelligence quotient, age, and grade. Miller, et al. (1972) reported that age, sex, and race do not appear to significantly affect LBC scores, whereas similarly to younger children, the child's intelligence and the parent's socioeconomic level are inversely correlated with deviant behaviors for children aged 7–12. As noted earlier, general population norms are not available for the adolescent sample.

Clinical norms are provided in the manual for 134 children aged 3–6 years, and their demographic characteristics are compared to those of a random population of 271 non-clinic-referred same-age children. Clinical norms and relevant demographic statistics are also presented for 348 children aged 7–12 who were referred to psychiatric settings and to the psychological services of juvenile detention centers. Demographic information is compared to 50 randomly se-

lected 7- to 12-year-old children. The adolescent checklist has been normed against 272 clinic-referred 13- to 17-year-olds who represent a wide range of family income levels.

Split-half reliabilities of Forms E1 and E2 from diverse clinical and non-clinical populations are acceptable. Split-half reliabilities for 4- to 6-year-old children range from as low as .60 for Sexual Behaviors to as high as .97 for Rare Deviance, with a mean split-half reliability of .84. Split-half reliabilities are as low as .33 for 7- to 12-year-olds and as high as .90 for males and females on Aggression, with a mean split-half reliability of .86 on all scales. Split-half reliabilities obtained in the adolescent clinical sample range from a low of .63 for Neurological or Psychotic Abnormality to a high of .94 for Severity Level and Total Pathology, with a mean split-half reliability of .83 on all scales. Three-month test-retest reliabilities are .78 for boys and girls aged 7-12 (Miller, Hampe, Barrett, & Noble, 1972) but are not reported for 4- to 6-year-olds or for the adolescent clinical sample.

Four criterion-related studies of the LBC for children aged 6-12 have been conducted. These studies indicate that, when children are referred to outpatient treatment centers, the LBC clearly differentiates these children from the general population. Studies also indicate that phobic, learning-disabled, and autistic children have distinct LBC profiles (Hampe, 1975; Hampe, Miller, Noble, & Barrett, 1972; Miller 1967a). Less extensive studies have been carried out with the adolescent samples, but data based on 36 normal adolescents, 214 adolescents seeking psychiatric treatment, and 112 delinquent adolescents show clear differences on the LBC among the three groups. In general, findings from these adolescent samples are similar to the criterion-related studies with younger children that show that parents of children and adolescents referred to psychiatric or delinquent facilities endorse three times as many child problems as parents in the general population.

### *Conners Parent Symptom Questionnaire*

The Conners Parent Symptom Questionnaire (PSQ; Conners, 1970) and, particularly, the Conners Teacher Rating Scale (TRS; Conners, 1969) have been widely used for both research and clinical purposes. The survey conducted by Rosenberg and Beck (1986) found that more than 40% of the child clinical psychologists polled endorsed the TRS, followed closely by the PSQ, as the preferred checklists for assessing hyperactive characteristics in children. Similarly, school psychologists rated the PSQ and the TRS as the second and third most preferred checklist for assessing children's hyperactive characteristics. Both scales were developed to aid in the identification of children with hyperactive characteristics and to evaluate the effectiveness of the treatment of behavior problems among hyperactive children. However, both scales are recognized as being able to identify other learning and behavior problems (Kupietz, Bialer, & Winsberg, 1972).

The original PSQ consisted of 93 items, but an abbreviated 48-item scale is available without loss of significant information (Goyette, Conners, & Ulrich,

1978). Each item on the PSQ and the TRS is scored as 0 ("not at all"), 1 ("just a little"), 2 ("pretty much"), or 3 ("very much"). Goyette *et al.* (1978) reported normative data on the PSQ for 529 boys and girls from 3 to 17 years of age randomly selected from the greater Pittsburgh area. Factor analysis of the 48-item PSQ yields the following scales: Conduct Problems, Learning Problems, Psychosomatic Problems, Impulsivity-Hyperactivity, and Anxiety. Although the child clinical literature generally suggests a low agreement among adults when rating the same child, correlations between mothers' and fathers' ratings on the PSQ were in moderate agreement and ranged from .46 on the Psychosomatic factor to .57 on the Conduct Problem factor. Test-retest of the PSQ has not been reported. The PSQ has been shown to discriminate between normal and hyperactive children (Conners, 1970; Kupietz *et al.*, 1972). However, Barkley (1981) reported that the hyperactivity score and the total score on the PSQ correlate not with objective measures of activity or attention, but with measures of child noncompliance with parental commands.

### *Conners Teacher Rating Scale*

In the same study reported by Goyette *et al.* (1978), 383 of the 529 children were rated by teachers on the TRS. Three factors were identified from this sample: a Conduct Problem factor, a Hyperactivity factor, and an Inattentive-Passive factor. Normative data by parents and teachers alike show that the PSQ and the TRS are related to children's sex and age. Specifically, children's scores decline as they get older, and boys have higher factor scores than girls. In particular, on the Hyperactivity factor, there is a strong sex effect, with boys being rated as displaying more hyperactivity characteristics than girls. Not surprisingly, parent versus teacher factor correlations on the PSQ and the TRS were lower than mother-father comparisons, although parents and teachers showed moderate agreement (.49) on the Hyperactivity factor.

More research has been conducted on the TRS than on the PSQ. Trites, Blouin, and Laprade (1982) conducted a factor analysis of the TRS using a random sample of over 9,000 Canadian schoolchildren. These investigators extracted six factors in the TRS that are reported in descending order according to the percentage of variance accounted for by each factor. The first factor was a Hyperactivity factor, followed by Conduct Disorder, and then an Emotional Indulgent factor, which seems to describe behaviors that are primarily affective. The three remaining factors were Anxious-Passive, Asocial, and a Daydream/Attention Problem factor.

Various validity studies of the TRS have found the Hyperactivity factor to be sensitive to drug treatment (Conners, 1969, 1972; Werry & Sprague, 1970). Kupietz *et al.* (1972) reported that the TRS discriminates between normal and hyperactive children. A one-month test-retest reliability of the TRS ranged from .72 for the Inattentive-Passive factor to .92 for the Conduct Problem factor for children with hyperactive characteristics who had been placed in a placebo control group not receiving pharmacological intervention (Conners, 1969).

### *Adaptive Behavior Scale*

A checklist that is often used for mentally retarded or developmentally disabled individuals, as well as for individuals with single (e.g., hearing loss) or multiple handicaps, is the American Association on Mental Deficiency (AAMD) Adaptive Behavior Scale (ABS) (Nihira, Foster, Shellhaas, & Leland, 1975). The ABS assesses the effectiveness of an individual's coping with the natural and social demands of his or her environment. Completing the ABS requires little training, and the scale was designed to be administered by either professionals or paraprofessionals. In order to complete the ABS, information may have to be collected from several staff or professional members who spend considerable time with the targeted individual, as the scale assesses an array of functional and adaptive behaviors.

The ABS is the most widely used checklist for assessing adaptive behavior, primarily because of its comprehensiveness and large standardization sample (Beck, 1983). The scale consists of two parts. Part One is organized along developmental lines and is designed to assess an individual's progress in 10 areas of functioning: Independent Functioning, Physical Development, Economic Activity, Language Development, Number and Time, Domestic Activity, Vocational Activity, Self-Direction, Responsibility, and Socialization. Part Two is designed to assess maladaptive behaviors related to personality and behavior disorders. These 14 behavior domains are Violent and Destructive Behavior, Antisocial, Rebellious Behavior, Untrustworthy Behavior, Withdrawal, Stereotype Behaviors and Odd Mannerisms, Inappropriate Interpersonal Manners, Unacceptable Vocal Habits, Unacceptable and Eccentric Habits, Self-Abusive Behavior, Hyperactive Tendencies, Sexually Abberant Behavior, Psychological Disturbances, and Use of Medication. Obviously, Part Two of the ABS is also designed to assess the individual's ability to meet social norms. Scoring is computed by adding subdomain totals and finally domain totals. The raw domain score is then compared with normative data. The ABS provides a Profile Summary Sheet for the 24 domains so that a visual profile allows comparisons with national norms of institutionalized mentally retarded individuals. Norms are grouped according to the following ages: 3, 4, 5, 6-7, 8-9, 10-12, 13-15, 16-18, 19-29, 30-49, and 50-69. Norms are based on a large standardization sample of mildly to moderately delayed individuals residing in residential settings, with as few as 97 institutionalized 3-year-olds and as many as 528 10- to 12-year-olds. For children aged 3-6, norms are not available for many of the domains; consequently, the ABS is more appropriate for older children and adults.

Reliability of the ABS is reported for 133 residents at three state training schools, but the ages of the residents are not specified (Nihira *et al.*, 1975). Interrater agreement on each resident assessed by two independent staff members shows that reliabilities for Part One range from .93 for Physical Development to .71 for Self-Direction. The mean reliability for all domains in Part One is very stable at .86. Interrater reliability for Part Two domains is not as stable, as some domains have a limited range and are severely positively skewed in their score distributions. Therefore, reliability scores were dichotomized. Phi coeffi-

cients for these domains range from as low as .49 interrater agreement in Self-Abusive Behavior to as high as .69 for Untrustworthy Behavior. The mean reliability for all domains in Part Two is .57, which is low but understandable given the situational differences found in many of the classes of behavior and the limited range of scores in these domains. Test-retest reliability of the ABS has not been reported. Only a few studies have assessed the validity of the ABS. One study (Nihira *et al.*, 1975) involving 41 institutionalized mentally retarded 10- to 13-year-olds showed that Part One domains discriminated significantly between those who had been previously classified at different levels of adaptive behaviors according to clinical judgment.

In summary, although the ABS is considered the best checklist for assessing adaptive behavior because of its ability to evaluate the strength and weakness of broad behavior classes (Shapiro & Barrett, 1981), the scale is not particularly suited to young handicapped children because many of the domains are not applicable to preschool children. In addition, the scale is normed on institutionalized residents, and normative data are not available for the majority of cognitively and multiply handicapped children who remain in community programs. Finally, extensive reliability and validity studies have not been conducted with the ABS for young children.

On the other hand, the AAMD Adaptive Behavior Scale, School Edition (ABS-SE), which was revised in 1981, was developed to aid school personnel in obtaining measures of schoolchildren's adaptive functioning (Lambert, Windmiller, Tharinger, & Cole, 1981). Part One and Part Two domains of the ABS-SE have headings similar to those found in the ABS, but the domains are geared to younger children. The 1981 revised ABS-SE provides norms for normal IQ, educable mentally retarded (EMR), and trainable mentally retarded (TMR) groups aged 3–16. The standardization sample of the revised scale was increased from 2,600 to 6,500 children and adolescents. Similarly to the ABS, raw scores can be converted to percentiles and are grouped according to chronological age. The ABS-SE is better suited to young children than the better known ABS, but reliability and validity studies of the ABS-SE have not been reported.

### *Denver Developmental Screening Test*

The Denver Developmental Screening Test (DDST) is the most extensively used screening device that assesses infants and preschool children's gross-motor, language, fine motor-adaptive, and personal-social development (Frankenburg & Dodds, 1967). The test is made up of 105 items, which are divided into 75 age categories, the majority below 2 years of age, when developmental changes are more rapid. The DDST was originally administered to over 1,000 normal Denver children between the ages of 2 weeks and 6 years, although this sample was not a stratified random sample. Items for the DDST were selected from various developmental and preschool intelligence tests and were chosen for the DDST if items could be easily administered and interpreted within a specific developmental time frame. The DDST can be administered by non-professional personnel and takes 15–20 minutes to complete. The format of the

screening test provides normative data displayed on a graph, and each item is represented by a horizontal bar placed along an age continuum. Various points on the bar represent specific ages at which 25%, 50%, 75%, and 90% of the children from the standardization sample pass an item. Test-retest reliability at a one-week interval had been calculated for 13 age groups between 1.5 months and 49 months. Correlations range between .66 and .93, with no age trend displayed. The intertest agreement of this instrument averages 90% (Frankenburg, Camp, Van Natta, Demersseman, & Voorhees, 1971). The DDST has been shown to be effective in predicting later school learning problems, as 61%–88% of children identified as delayed on the DDST manifested school learning problems and/or IQs below 80 three years later (Camp, van Doorninck, Frankenburg, & Lampe, 1974).

As the original test takes 15–20 minutes to administer, the DDST has recently been revised (DDST-R) (Frankenburg, Fandal, Sciarillo, & Burgess, 1981). In the DDST-R, the 105 items on the original screening test are arranged in chronological stepwise order in each of the four broad areas of the test. To administer the DDST-R, the examiner identifies and scores three items that fall immediately to the left of the chronological age of the child. If any of the three items is failed or refused by the child, the full DDST is to be administered. Agreement between the DDST-R and the original DDST was very high; consequently, Frankenburg and his colleagues have argued that validity studies do not need to be conducted on the revised DDST-R.

## SELF-REPORT MEASURES

The most popular assessment method in clinical psychology is self-report measures (Kazdin, 1980), yet children's self-report measures have not been given much emphasis in the assessment of childhood psychopathology. The reasons for the underutilization of self-report measures are that children are viewed as not being capable of accurately reporting their psychological state. Generally speaking, self-report measures have often been eschewed because of the apparent lack of correspondence between self-report measures and observable behaviors (Finch & Rogers, 1984). However, it is now recognized that a child's perceptions of his or her problem(s) are critical to a better understanding of the ramifications of children's clinical problems. Furthermore, the lack of agreement between self-report measures and observable behaviors does not necessarily suggest that one method of assessment is more accurate than the other; instead, it suggests that each method taps a different dimension of multifaceted problems (Mash & Terdal, 1981).

Instead of discussing several child self-report measures, this section will briefly discuss three measures, one that is already widely used and known, the Children's Depression Inventory (CDI; Kovacs 1980–1981); another measure that has the potential to be widely used by child assessors because it examines critical aspects of children's psychological functioning, namely, perceived competence (Harter, 1982); and a new measure that assesses children's social skills

(Matson, Rotatori, & Helsel, 1983b), an area that is of critical importance to children's present and future adjustment.

### *Children's Depression Inventory*

The CDI is a 27-item self-report measure that is a downward extension of the Beck Depression Inventory (BDI) for adults (Beck & Beamesderfer, 1974). Each of the 27 items consists of three sentences, which purportedly can be read by first-grade children (Kazdin & Petti, 1982). The child chooses the one sentence that best describes him or her over the past two weeks. Each item can be scored from 0 to 2, resulting in a range of scores from 0 to 54. A recent examination of the psychometric properties of the CDI (Saylor, Finch, Spirito, & Bennett, 1984) shows that one-week test-retest reliability is .87 for emotionally disturbed children, but only .38 for normal children. Saylor and her colleagues reported a series of validity studies showing that the CDI discriminated 24 hospitalized child-psychiatry patients from 24 normal children matched on age and sex. High- and low-depression groups based on CDI scores indicated that high-depression groups were more external in their locus of control and reported higher levels of anxiety than low-depression groups. Factor analysis based on 198 children indicated that the CDI is a multidimensional measure that assesses different factors of depression that are similar to the DSM-III criteria of depression (American Psychiatric Association, 1980). Helsel and Matson (1984) identified four factors—Affective Behavior, Image/Ideation, Interpersonal Relations, and Guilt/Irritability—when public school teachers' completed CDIs were factor-analyzed for 216 children ranging from 4 to 18 years of age. The four factors accounted for 91.7% of the variance, with the majority of the variance (67.6%) being accounted for by the Affective Behavior factor. These authors further found that older children displayed more depression symptomatology according to the teacher-completed reports, but that there were no differences based on race or gender. A major limitation of the CDI is the lack of a stratified clinical and nonclinical normative sample grouped according to grade and sex.

### *Perceived Competence Scale*

The Perceived Competence Scale (PCS) for children (Harter, 1982) is a new self-report measure that differs from other child self-esteem measures (most notably from the well-known Piers-Harris Children's Self-Concept Scale [Piers-Harris, 1969]) because the PCS assesses a child's perceived competence across cognitive, social, and physical domains. Also assessed is a fourth subscale, general self-worth, which is independent from the other three skill domains. The factorial validity of the four subscales has been demonstrated and buttresses Harter's argument that children as young as 8 years old can make distinctions in their perceived skill domains.

The 28-question format of the PCS is somewhat unusual and was devised to offset the tendency to give socially desirable responses. In each question, the child is asked to describe which kind of child he or she is most like from two

choices, for example, "Some kids find it hard to make friends, but for other kids it's pretty easy." The child then decides whether the description chosen is sort of true or really true for him or her. Each item is scored from 1 to 4, where a score of 1 indicates low perceived competence and a score of 4 reflects a high perceived competence. The scores are then summed and averaged for the seven questions in each of the four subscales, the result being four separate subscale scores.

The PCS can be used for third- through ninth-grade children, although the measure will probably have to be read to 8- to 10-year-old children who are poor readers. Means and standard deviations of PCS scores broken down by grade for over 2,000 children have been presented by Harter (1982). However, these samples appeared to be assessed more by convenience than by a stratified sampling procedure. Three-month test-retest reliabilities of the PCS were .78, .80, .87, and .70 for the four subscales, and .78, .75, .80, and .69 after nine months for the four subscales with another sample of children. The major disadvantage of the PCS is that it is a new instrument, but as future empirical studies are conducted, the PCS has the potential to become a popular self-report measure in research and in child clinical settings because it assesses multifactorial dimensions of children's self-concept.

### *Matson Evaluation of Social Skills in Youngsters*

Children's social skills have received a great amount of attention in recent years because there is evidence that peer relationship difficulties in childhood are associated with adjustment problems in later life (Cowen, Pederson, Babi-gian, Izzo, & Trost, 1973; Rolf, Sells, & Golden, 1972). However, a major problem in assessing children's social behaviors has been that researchers have often assessed problem children's social skills using role-play tests, which have questionable validity and reliability (Van Hasselt, Hersen, & Bellack, 1981). Another problem in assessing children's social behaviors has been that researchers and clinicians have identified problem social behaviors based on *a priori* assumptions rather than on well-delineated skills or deficits.

The Matson Evaluation of Social Skills (MESSY) is a new measure that can be filled out by either a teacher or a child in order to identify potential social-skill problems (Matson, Rotatori, & Helsel, 1983). The 62-item self-report MESSY has been validated on 422 preschool- and elementary-age children and high school adolescents, ranging from 4 to 18 years old. The items are read aloud to each child and are rated by the child or adolescent on a 5-point scale (1 = "not at all"; 5 = "very much"). Factor analysis of this instrument has identified five factors: Appropriate Social Skill, Inappropriate Assertiveness, Impulsive/Recalcitrant, Overconfident, and Jealousy/Withdrawal. Test-retest reliability has not been reported.

The teacher-completed version of the MESSY, a 62-item measure, based on ratings of 322 children ranging from 4 to 18 years old, identified two broad factors using factor analysis: Inappropriate Assertiveness/Impulsivity and Appropriate Social Skills. The self-report MESSY has been found to show a modest



correlation coefficient of .28 with a structured interview with normal elementary-age children who were asked what they would say and do in six different positive and negative social situations (Matson, Esveltd-Dawson, & Kazdin, 1983). A teacher-completed MESSY correlated more strongly with a teacher-completed CDI for 76 children ranging from 4 to 10 years old, demonstrating a negative relationship between positive social skills and childhood depression (Helsel & Matson, 1984). As a self-report or teacher-completed measure, the MESSY is a step in the right direction of developing and validating a battery of assessments that can be used to evaluate children's social and depressive behaviors. However, in order to be of more clinical utility, the MESSY needs a clinic and nonclinic normative sample based on demographic characteristics such as age, sex, and socioeconomic levels. Measures like the MESSY also need to validate their instruments to empirical behavioral correlates of peer social status (Beck, Collins, Overholser, & Terry, 1985; Dodge, 1983; Dodge, Coie, & Brakke, 1982).

## SUMMARY

In summary, 14 commonly used checklists assessing general child behavior and psychological problems and 3 relatively new self-report measures, each of which assesses a topic of clinical importance, have been described. As is to be expected with such a diversity of instruments, the checklists vary in stability and accuracy as measures of child behaviors and characteristics. Perhaps the most surprising limitation of many instruments is the presentation of small or non-representative normative samples. For example, the three Devereux rating scales do not provide representative samples of clinical and nonclinical children, yet the Devereux Elementary School Behavior Rating Scale II is widely used by school psychologists. Exceptions to this problem, with good clinical and non-clinical norms, are the Personality Inventory for Children, the Child Behavior Checklist, and the Louisville Behavior Checklist, Forms E1 and E2. Before the development of new checklists such as the Personality Inventory for Children and the Child Behavior Checklist, the Behavior Problem Checklist was the most widely used checklist for assessing children's problem behaviors. As soon as more normative data become available for the Revised Behavior Problem Checklist, this instrument should regain its high visibility in clinical child psychology.

One problem with the checklists reviewed is that most of the instruments have scales that have not been empirically constructed by factor analysis; instead, they have been constructed by clinical judgments that do not necessarily discriminate criterion (clinical) groups from one another or from normal children. Notable exceptions to this problem are the Personality Inventory for Children and the Child Behavior Checklist.

There are several potential limitations on the use of checklists in clinical practice. One of the major problems with inventories completed by parents or other adults is the rater's inexperience with various types of deviant behavior

(Miller, 1981). Related to this problem is the fact that checklists inherently assess raters' sensitivity and threshold for child behaviors. Some parents may be very sensitive to or may have a low threshold for certain behaviors and will exaggerate symptoms, whereas other parents may underreport deviant or troublesome child behaviors. Another potential problem with checklists is the fact that fathers tend to underestimate and mothers tend to overestimate their children's deviant behaviors (Mash & Johnston, 1983). These facts suggest that parents' perceptions as well as general screening of the child's behaviors are being assessed. The accuracy of raters may vary greatly, depending on such factors as education level, the amount of stress associated with the child's behaviors, and the hidden agendas that parents may have when rating a child; for example, a mother may want the clinician to view her child as deviant so that the clinician will intervene, whereas the father, thinking of the potential costs involved in treatment, may minimize the frequency and severity of the child's behaviors.

When one considers the amount of training and skill required to train research assistants to objectively observe children's behaviors, it is a wonder that we consider checklists "objective" measures of a child's behaviors. In fact, Novick, Rosenfield, Block, and Dawson (1966) found that a large percentage of items checked by parents on a checklist could not be verified. Nonetheless, the inherent subjective nature of rating children's behaviors is the very strength of checklists because this method allows the clinician to initially screen a child's behavioral domains from the parent's perception.

Another problem in using checklists to rate a child's behavior is that this procedure can imply to parents and clinicians a trait notion of children's deviant behavior, when, in fact, the occurrence of deviant behavior requires assessment of the situations or the social contexts in which the behavior occurs, specifically the antecedents and the consequences of the specific behavior, in order to implement successful treatment interventions. Clinicians may also assume that high scores on a particular scale suggest a clinical diagnosis, when, in fact, most scales on the checklists reviewed are not directly equivalent to any clinical diagnosis.

There are also clear limitations associated with self-report measures. These measures, by their very nature of asking children their subjective opinions, are vulnerable to distortion. Children, like adults, are likely to endorse items that reflect socially desirable responses. Self-report measures also tend to depend heavily on reading and verbal skills, a dependence that is a particular problem for children who have serious reading or verbal comprehension difficulties. Given these limitations, children's self-report measures should not be used as the only assessment method when identifying child psychopathology. Self-report measures provide a broader perspective of potential child problems and thus complement other assessment information collected for a particular child.

It should always be kept in mind that checklists are initial screening measures. They can offer a quick, efficient, and quantifiable assessment of children's behaviors and characteristics. Given the limitations of checklists, they can provide valuable information that aids in the identification of problem behaviors that require psychological intervention.

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# 6 *Neuropsychological, Physiological, and Biochemical Assessment*

AMOS ZEICHNER

The physical, psychoeducational, and behavioral development of the child is a prime concern in our society. Over the years, parents, teachers, administrators, and members of the helping professions have been called on to evaluate whether the child who in their care was evincing the expected and desirable development pattern. This demand for assessment has increased commensurately with the burgeoning availability of educational challenges and higher societal expectation placed on the child. As a result, the initial nonsystematic, anecdotal, and impressionistic methods of child evaluation are continuously being replaced by sophisticated, multidisciplinary, and standardized methods of assessment.

The multidisciplinary approach to the assessment of a child's development has become necessary with the growing understanding of children's psychobiological functioning within the social milieu. It is now held that behavior—and, for that matter, behavior disorders—is a function of the interaction between several domains. Consequently, psychopathology and behavior disorders such as depression, attention deficit disorders, learning disabilities, autism, and schizophrenia are currently conceptualized within a genetic, biochemical, physiological, neuropsychological, environmental, and social context. Therefore, the comprehensive assessment of a child's development, whether normal or impaired, would require careful consideration of such multidisciplinary factors.

The focus of this chapter is the domains requiring consideration in the assessment of childhood psychopathology. Included are some of the neuropsychological, physiological, and biochemical methods used as diagnostic procedures. The methods reviewed are grouped by type of procedure and not by the specific disorder assessed. Other chapters in this volume present methods specifically dedicated to the assessment of childhood behavior disorders.

## NEUROPSYCHOLOGICAL METHODS

The multifaceted brain–behavior relationships require a complex assessment approach to the diagnosis of disorders associated with brain lesions. The neuropsychodiagnostic armamentarium is comprised of an extensive number of tests designed to evaluate areas such as memory, sensorimotor, perceptual, verbal, spatial, and tactile processes (Golden, 1978; Lezak, 1976). Commonly, a combination of tests is used as a battery aimed to diagnose or localize brain dysfunctions that are thought to be related to observed or suspected behavioral deficits (Heaton, Baade, & Johnson, 1978; Reitan & Davison, 1974). Test results are compared to norms for impaired and normal performance patterns before a diagnosis is established. To date, virtually hundreds of tests have comprised the field of neuropsychological assessment. Although some of the tests have been specifically developed for that purpose, others are general tests of performance and intellectual function that are used to gather other pertinent data. Although it is impossible to enumerate all the relevant neuropsychological tests in this chapter, several examples of composite and individual standardized tests are presented below.

### *Composite Tests*

#### *Reitan-Indiana Battery*

This neuropsychological test battery should not be confused with the similar Halstead battery for children that is discussed below. The Indiana battery is designed to assess in children of 5–8 years of age motor, spatial, and verbal abilities; visual, tactile, and auditory perception; abstraction; and memory (Reitan, 1969). Nine subtests are included in the battery: Category, Finger Tapping, Tactual Performance, Marching, Color Form, Progressive Figures, Matching Pictures, Target, and Individual Performance.

The Category test uses stimuli that are projected onto a screen. The subject is required to indicate the correct answer on a response panel. A bell or buzzer follows the correct or incorrect answers, respectively. The subject's task is to identify the "principle" that unifies the presented figures. Abstract reasoning, short-term recall, and adequate attention span are required for successful performance on this subtest.

The Finger Tapping test requires the subject to speed-tap with the index finger using a lever and an electrically operated counting device. This test is used to evaluate the subject's lateralized fine-motor coordination.

The Tactual Performance test requires the blindfolded subject to fit six formed blocks into matching recesses on a formboard. The task has to be completed with the dominant hand alone, the nondominant hand, and both hands. The time required by the subject to complete each trial is taken as an indication of the relative efficiency of each hand and of both hands. After the test and the removal of the blindfold and the blocks, the subject is required to draw via recall the blocks used in the test. This test provides information on tactile form dis-



crimination, motor coordination, spatial visualization, and sensory-spatial performance.

The Marching test is comprised of numerous circles printed on both sides of several sheets of paper. The subject is required to connect the circles in a predetermined order with a pencil, using his or her dominant and nondominant hands on separate trials. This test provides information on the subject's gross-motor functioning.

The following three tests provide information on the subject's organizational ability, abstraction, concept formation, and cognitive flexibility. The Color Form test requires the subject to follow a sequence of figures varying in color and shape by alternately moving from two figures similar in shape to two figures similar in color. In the Progressive Figures test, the subject is to connect geometrically related shapes. In the Matching Pictures test the child is required to match increasingly complex figures printed on several pages.

The receptive and expressive components of visual-spatial relationships are assessed by the Target test and the Individual Performance test. The tests are scored on the basis of accuracy and speed of performance. The Target test requires the child to reproduce a pattern drawn by the examiner across a preprinted nine-dot square. Four tasks comprise the Individual Performance test: "Matching V's," in which the subject is to arrange small blocks at specific angles depicted on a stimulus card; "Star," in which the child is required to draw a six-sided star by means of two overlapping triangles; "Matching Figures," in which the subject is to match the appropriate figures on several stimulus cards; and "Concentric Squares," where the subject is required to reproduce a design consisting of several concentric squares.

### *Halstead Neuropsychological Battery for Children*

Adapted from the Halstead version for adults, several subtests were simplified for use with children aged 9–14 (Reitan, 1969; Reitan & Davison, 1974). The Category test, the Tactual Performance test, and the Finger Tapping test included here are identical to those discussed above. Additional subtests include the Rhythm test, the Speech Sound Perception test, and the Time Sense test.

The Rhythm test requires the subject to differentiate rhythm beats that are identical from those that are different from each other. The Speech Sound Perception test requires the child to identify which of four preprinted nonsense words matches a spoken nonsense stimulus word. The Time Sense test requires the child to match lever depressions to a sweep hand on a timer and subsequently to recall the correct key depression latency from memory.

Taken as a whole, the subtests of the Halstead battery for children are designed to gather information on the child's abstract thinking, tactile perception, lateralized fine-motor coordination, visuomotor coordination, nonverbal auditory perception, sustained attention, and memory.

The two neuropsychological batteries discussed above are not used exclusive of one another. The tasks that are added by the Halstead battery are often used by the diagnostician in addition to the Reitan-Indiana battery. Both

batteries have been used to differentiate children with minimal brain damage from controls (Klonoff & Low, 1974; Reitan & Boll, 1973), as well as to differentiate learning-disabled children with brain damage from learning-disabled subjects without suspected organic lesions (Tsushima & Towne, 1977). Finally, the batteries have helped in diagnosing brain damage in behavior-disordered children (Knights & Tymchuk, 1968).

*Wechsler Intelligence Scale for Children: Revised*

The revised version of the Wechsler Intelligence Scale for Children (WISC-R; Wechsler, 1974) is a test of the intellectual ability of children aged 6–16 years 11 months. It was derived from the original Wechsler for children (Wechsler, 1949). The WISC-R is comprised of 10 subtests: Information, Picture Completion, Similarities, Picture Arrangement, Arithmetic, Block Design, Vocabulary, Object Assembly, Comprehension, and Coding or Mazes. These subtests are designed to measure general knowledge, delayed and immediate memory, concept formation, auditory attention, visuomotor coordination, visual recognition, and visuospatial skill. For a detailed description of the subtests included in the WISC-R, the reader is referred to the appropriate manual (Wechsler, 1974).

The WISC and the WISC-R have been used extensively in the assessment of children with learning disabilities and/or conduct disorders (Klatskin, McNamara, Shaffer, & Pincus, 1972; Myklebust, 1973; Reitan & Boll, 1973) and hyperactivity (Palkes & Stewart, 1972), and of children labeled as having “minimal cerebral damage” (Klonoff & Low, 1974). In addition, it would seem important to note that several subtests derived from the Wechsler test have been used in the assessment of children suffering from syndromes labeled “childhood schizophrenia” and “primary infantile autism” (Bortner & Birch, 1969; Gitelman & Birch, 1967).

*Luria-Nebraska Neuropsychological Battery*

This neuropsychological battery was developed by Golden, Hemmeke, and Purisch (1978, 1980) based on theories advanced by the Russian neuropsychologist Luria (1973, 1980). These theories highlight the complexity and multidimensionality of mental processes and the evolution of cerebral functional units. Luria stressed that neuropsychological deficits should be assessed via the breakdown of a mental function into its components. This approach was operationalized by Golden and colleagues (1978, 1980), and good validity and reliability of the test have been demonstrated with several clinical populations (Golden, Ariel, McKay, Wilkening, Wolf, & MacInnes, 1982; McKay & Golden, 1981).

The Luria-Nebraska battery consists of 269 items, each scored 0, 1, or 2, indicating normal, borderline, or deficient performance on an item. The items are grouped into 11 functional categories: Motor, Rhythm, Tactile, Visual, Receptive Language, Expressive Language, Reading, Writing, Arithmetic, Memory, and Intelligence. In addition, specific items provide for two hemispheric localization scales and a scale particularly sensitive to organicity.

This battery has recently become popular because of its efforts to operationalize Luria's complex theories and its ability to identify specific mental dysfunctions. The battery is portable and requires less time to administer than other neuropsychological test batteries. More recently, the battery has been used in the assessment of severely delinquent adolescents (Brickman, McManus, Grapentine, & Alessi, 1984).

## *Individual Tests*

### *Bender Visual-Motor Gestalt Test*

The "Bender," or the Bender Visual-Motor Gestalt Test (Bender, 1946; Koppitz, 1964), is designed to uncover visuoperceptual and spatial performance deficits in the testee. The test is comprised of nine stimulus cards, each presenting a distinct graphic pattern (e.g., a series of dots or interlocking trapezoids). The stimuli are presented one at a time with the instruction to copy each as accurately as possible. Some administrations also require the subject to reproduce accurately from memory as many designs as he or she can recall. This option provides the diagnostician with information regarding possible deficits in visual recall.

The Bender is scored in terms of the errors made in stimulus size, accuracy of detail, rotation of design, and intrusion among design parts. This test has been used in the assessment of learning-disabled children. These subjects evidenced a significantly higher mean error score on the test than did controls (Ackerman, Peters, & Dykman, 1971; Larsen, Rogers, & Sowell, 1976). The test successfully differentiates between learning-disabled children and controls regardless of the type of learning disability evinced by the child (Koppitz, 1975). Furthermore, poorer performance on the Bender by hyperactive children distinguished them from the better performing learning-disabled children (Wikler, 1970).

However, despite high levels of reliability noted for the administrations of the Bender, the diagnostician is cautioned against basing his or her conclusions on the rather limited source of functional information provided by this test. Data regarding visuomotor and perceptual-spatial deficits must be corroborated by other subtests in the neuropsychological battery.

*Wide Range Achievement Test.* This test battery has been designed to assess individuals ranging in age from early childhood to the middle adult years (Jastak & Jastak, 1965). Spelling, reading, and arithmetic are assessed in two age ranges: 5–11 and 12–45. Spelling is tested by means of copying and dictation, reading by means of lists of letters and words being read by the subject, and arithmetic by oral and written exercises. The large variety of arithmetic problems offers particularly important information for neuropsychological assessment. The application of the four basic arithmetic operations, percentages, fractions, algebra, squares, roots, and some geometric principles facilitates the differential diagnosis of spatial-type dyscalculia (inability to count), figure or number alexia (inability to read), or anarithmetria (inability to conceive number concepts). This

test has been used, among other purposes, for the study of learning-disabled children (Rourke & Finlayson, 1978; Rourke, Young, & Flewelling, 1971).

### *Stroop Color Word Interference Test*

This test assesses the ability of the subject to shift his or her perceptual set to conform to changing demands (Stroop, 1935). Three stimulus cards are presented to the subject in sequence. Each card displays three items 100 times in a random order. The first card displays the words *red*, *blue*, and *green* printed in black; the second card depicts red, blue, and green rectangles; and the third card displays color words so that the color of the print is always incongruent with the word's meaning. The subject is required to read the words and describe the objects on each card as rapidly as possible, and to name the print color while ignoring the word's meaning on the third card. This test has been used with various modifications in the assessment of brain damage and adolescent delinquency (Broverman, Broverman, Vogel, & Palmer, 1964; Wolff, Waber, Baummeister, Cohen, & Ferber, 1982).

As part of a broader group of tests, several other tests and subtests are used in the context of neuropsychological assessment of possible mental dysfunctions, conduct disorders, and juvenile delinquency. Language tests include the Reading Recognition subtest of the Peabody Individual Achievement Test (Dunn & Markwardt, 1970), in which the subject's pronunciation, but not comprehension, of words of increasing difficulty is tested; the Peabody Picture Vocabulary Test (Dunn, 1965), which requires the subject to choose a picture that appropriately represents a stimulus word; and the Boston Naming test (Goodglass & Kaplan, 1972), in which the subject has to correctly identify a series of line drawings. Perceptual-motor and spatial ability tests include the Grooved Pegboard Test (Reitan & Davison, 1974), in which the subject is required to insert coded pegs into similarly coded holes, and the Porteus Mazes Test (Porteus, 1959), in which the subject's task is to trace preprinted mazes under time limits without crossing any maze lines.

### *Strengths and Weaknesses*

The test explosion that has occurred in the field of neuropsychological assessment has brought about a significant development in the assessment of childhood psychopathology. The contemporary diagnostician has a much greater understanding of the functional and behavioral deficits evinced by the child. In this understanding lies the strength of the neuropsychological assessment methods. Global diagnostic labels such as *autistic*, *hyperactive*, or *mentally retarded* have been replaced by specific diagnostic categories denoting specific dysfunctions or diagnostic subcategories. The multifaceted nature of test batteries and of individual test combinations provides the information necessary for the formulation of an accurate diagnosis. This complex yet precise assessment approach permits more specialized and "client-tailored" treatment programs.

Furthermore, the strength of the standardized neuropsychological batteries and tests lies in their generally good validity and reliability coefficients (Lezak, 1976). Also advantageous to both the clinician and the client, the cost of the test materials, instruments, and administration is not excessive. The fact that most materials consist of paper-and-pencil measures and manually operated instruments, with only very few requiring electronic components, has had a welcome cost-controlling effect.

With regard to the weaknesses attributed to the neuropsychological assessment tools, one has to consider the special administration requirements associated with these tests. The clients to whom these tests are administered clearly have specific deficits and, therefore, special needs during the testing situation. Attention deficit disorders, learning disabilities, minimal brain dysfunction, and a variety of emotional disorders are conditions that are likely to interfere with a highly standardized test administration. Although some subtests are specifically designed to assess deficits in test taking and other pertinent skills, other subtests are designed to assess substantially different mental and behavioral skills. A carefully controlled digression from the standardized administration procedures should be considered. Although this may result in a necessary modification of the reliability standard for a given test, the applicability of the test may be enhanced. Special training of the neuropsychological test administrator and close familiarity with the client population are clearly necessary.

## PHYSIOLOGICAL METHODS

Physiological assessment of children's nervous systems, like other assessment approaches discussed in this chapter, has focused on clarifying the associations between suspected brain dysfunctions and behavioral and emotional disturbances. Whereas several of the physiological techniques have been used in clinical practice to help in the diagnosis of child psychopathology, other techniques have seen use only in the experimental laboratory. Among the more often used measures to be discussed below are the electroencephalogram (EEG), the 40-Hz EEG wave pattern, cortical evoked responses (CER), the electropupillogram (EPG), the electrodermal response (EDR), the heart rate, systolic and diastolic blood pressure, and skin temperature. For further detail regarding these physiological indices and their recording, the reader is referred to other volumes (Greenfield & Sternbach, 1972; Martin & Venables, 1980).

### *Electroencephalogram*

The EEG is a measure of gross cortical activity, which is measured by means of plate electrodes placed over conventional sites on the subject's scalp. The detected signal is fed into a wideband preamplifier that serves to amplify and filter the signal before it is fed through a driver amplifier that drives a display unit, such as a chart-and-pen display. One monitoring and recording system

among numerous other EEG recording devices is the Series-7 Grass Polygraph (Grass Instruments Inc., Quincy, Massachusetts). Cortical activity is displayed as "brain waves" on a chart and is commonly analyzed in terms of the frequency, the amplitude, and the global pattern of the waveform.

The use of gross cortical activity in the diagnosis of children with a variety of disorders is based on the assumption, however equivocal, that these disorders would be characterized by unique EEG patterns or by the presence of a certain proportion of abnormal EEG tracings. For example, a study comparing children with learning and behavior disorders to nonclinical controls found more atypical EEG patterns during drowsiness or sleep in the clinical groups (Wikler, Dixon, & Parker, 1970). During a phase in which the expected prevalent EEG pattern consists of slow and rhythmical waves, clinical children evinced more sudden bursts of multifocal negative spikes, bitemporal repetitive spikes, paroxysmal spike waves, 6-Hz spikes, and other atypical waveforms.

Whereas other chapters in this volume discuss findings relative to specific classes of psychopathology, it is necessary to note here that the measure of gross cortical activity is far from unequivocal. Misurec and Vrzal (1969) found abnormal EEG patterns in 65% of children with severe problems, 31% with moderate problems, and 10% with no problems in learning and conduct. In a comparison of normal controls to children with "behavior disorders," 47% of the "disordered" children, as opposed to 28% of the controls, evinced abnormal EEG patterns (Stevens, Sachdev, & Milstein, 1968). In contrast, however, Werry, Minde, Guzman, Weiss, Dogan, and Hoy (1972) could not find EEG differences between hyperactive children and normal controls. Similarly, despite the often-mentioned observation that hyperactive children display excessive amounts of slow-wave activity (Dubey, 1976), Satterfield, Cantwell, Lesser, and Podosin (1972) failed to find resting-EEG-pattern differences between hyperactive children and controls. Interestingly, excessive amounts of slow-frequency EEG have been found to correlate with low verbal WISC-R scores in clinic-referred children, in comparison to above-normal scores for children with small amounts of low-frequency EEG (Corning, Steffy, & Chaprin, 1982). In sum, the clinical and diagnostic utility of this cortical activity measure must be further established.

### *40-Hz EEG*

This assessment approach represents an effort to establish more precise physiological diagnostic markers based on arousal theories. The 40-Hz measure is a relatively fast EEG frequency that is thought to reflect "focused arousal" or a state of attention necessary for adequate performance on problem-solving tasks (Sheer, 1976). The pattern, monitored via the means discussed above and further reduced with the aid of a computer, is thought to be evinced in an abnormally small amount by children with a short attention span or poor concentration. Sheer reported that, whereas normal controls evince an increase in 40-Hz activity during visual- and auditory-verbal tasks and tactile-kinesthetic tasks, learning-disabled children do not display such an increase. The measure is still experimental and awaits further validation.

### *Cortical Evoked Responses (CER)*

The CER is a representation of systematically alternating positive and negative changes in cortical electrical activity occurring in a time-locked fashion relative to an identified stimulus, such as a click or a light. In order to isolate a CER from its background of electrical "noise," averaging over a large number of trials is necessary. Convention identifies the polarity of the pattern with the letters *N* and *P* (negative and positive), and a three-digit number denotes the stimulus-to-peak latency in milliseconds. The amplitude and latency of these peaks has been observed to be affected by stimulus characteristics, the site of the recording electrodes, the subject's age, and the attentional and motivational parameters elicited by the experimental task.

### *Auditory Evoked Responses (AER)*

This assessment method uses an auditory stimulus that is presented to the subject, whose averaged evoked potential is monitored. The stimuli used include series of clicks that are delivered at amplitudes of 90 or 55 dB or a series of tones. Children diagnosed with minimal brain dysfunction (MBD) have been found to exhibit lower and slower AER peaks than normal controls when told to ignore a series of 90-dB clicks (Satterfield, Lesser, Saul, & Cantwell, 1973). Interestingly, the AER appears to be an index of drug treatment effectiveness. The MBD children who were treated with an unspecified dose of methylphenidate evinced larger AERs than those not treated, and these AERs were equivalent to the AERs of the normal controls. Not all MBD children responded to the drug similarly, however (Satterfield *et al.*, 1973).

### *Visual Evoked Response (VER)*

This assessment method uses a 1-Hz square wave light emitted at several intensity levels. These light stimuli are administered during tasks requiring attention or inattention states. In a comparison of MBD children and normal controls (Buchsbaum & Wender, 1973), the MBD subjects had higher VER amplitudes and shorter latencies at all light intensities than the controls. In contrast, Hall, Griffin, Moyer, Hopkins, and Rappaport (1976) found no VER differences between hyperactive children and normal controls. To date, neither the validity nor the reliability of the VER as a diagnostic tool has been established satisfactorily.

### *Electropupillogram*

The electropupillogram (EPG) has been used as a measure of arousal and arousability in the diagnosis of hyperactive children. In this method, the diameter of the pupil is measured by infrared scan in a darkened room. On visual stimulation of the pupil, its maximal contraction is determined. In a study of 22 hyperkinetic children treated with amphetamines, Knopp, Arnold, Andras, and

Smeltzer (1973) were able to differentially classify the subjects by the diagnostic categories of "unsocialized aggressive," "overanxious," and "hyperkinetic" (Fish, 1971), based on distinct EPG measures. To date, no replication of these findings is available.

### *Electrodermal Measures*

The electrodermal measures are indices of sympathetic arousal of the autonomous nervous system. The two most frequently used electrodermal measures are *skin conductance* and its reciprocal, *skin resistance*. These indices are grouped into measures of resting autonomic levels and measures of autonomic reactivity to specific stimuli. Accordingly, skin conductance level (measured in micro-mhos) and skin resistance level (measured in ohms) are measures of resting, or tonic, autonomic levels of arousal, whereas skin conductance response and skin resistance response are measures of autonomic reactivity, or phasic, response. Normally, increases in arousal levels (either tonic or phasic) result in increases of skin conductance (Edelberg, 1972).

Conventionally, the electrodermal indices are measured by means of two silver/silver chloride electrodes placed either over the volar part of the palm, on the middle and index fingers, or on the wrist and forearm. One electrode emits a weak electrical signal while the reference electrode measures the signal that is conducted to it by the skin. Conductance is determined by the characteristics of the skin membrane and by the density and contents of the sweat glands. The detected signal is amplified by a DC amplifier and finally by another amplifier that drives the recording or display device. For more specific details relevant to these measures, the reader is referred to the text on psychophysiological recording by Martin and Venables (1980).

Electrodermal measures have been used in the assessment of children with learning disabilities, hyperactivity, and conduct disorders. The majority of the studies have not found differences in autonomic resting levels between clinical and normal controls (Cohen & Douglas, 1972; Zahn, Abate, Little, & Wender, 1975). In contrast, several studies have found differences between the clinical and nonclinical groups in autonomic reactivity to sensory stimuli during a variety of tasks, with lower measures of reactivity found for the clinical groups (Delamater & Lahey, 1983; Satterfield & Dawson, 1971; Spring, Greenberg, Scott, & Hopwood, 1974). The extent of the observed autonomic changes appeared to be contingent on task and stimulus characteristics.

### *Heart Rate*

Heart rate is another measure of sympathetic and parasympathetic activity of the autonomous nervous system. Acceleration and deceleration of heart rate indicate changes in affective, attentional, and somatomotor states (Lacey & Lacey, 1974; Obrist, 1981). Commonly, the heart rate is recorded either from the specific bioelectric signals (beats) emitted by the heart or from the time interval between two beats. As the heart signal is exceptionally strong, it can be



monitored independently by various devices in a variety of sites. The electrocardiogram (ECG or EKG) is recorded via two or three electrodes (of either the plate or the cup type) placed in the Frank position diagonally across the chest (Strong, 1973). Other positions, such as the upper arm or the calf, are also appropriate. The signal is amplified by and filtered through an AC preamplifier and is fed into a recording and display device.

The EKG has been used in the assessment of various clinical groups and other populations at risk. Whereas some studies have found resting heart rate (HR) differences between MBD children and controls (Ballard, Boileu, Sleator, Massey, & Sprague, 1976), most researchers have not noted resting HR differences between clinical (e.g., MBD, conduct-disordered, hyperactive, and learning-disabled) populations and normal controls (Delamater & Lahey, 1983; Zahn *et al.*, 1975). In regard to phasic HR activity, most studies note a smaller deceleration in clinical groups than in normal controls during tasks where a significant HR deceleration is expected as an index of focused attention (Sroufe, Sonies, West, & Wright, 1973; Zahn *et al.*, 1975; Zahn, Little, & Wender, 1978). Interestingly, treatment with amphetamines improved this index in groups of hyperactive children (Zahn, Rapoport, & Thompson, 1980). Finally, and of particular interest, is the use of HR as a correlate of cognitive coping of children classified as Type A (coronary-prone). These children evinced lower phasic HR activity while using denial during a difficult cognitive task than did children classified as Type B (non-coronary-prone) individuals (Smith, Delamater, & Zeichner, 1984).

### *Blood Pressure*

Blood pressure has been used in the assessment of arousal in children with hyperactivity and Type A children. Blood pressure is not an arousal index of choice, as it is not a product of sympathetic activation by itself. This measure is mediated by the heart's stroke volume, by the condition of the cardiovascular system, and by peripheral vascular resistance, to name a few variables. Systolic blood pressure (SBP) is the intra-arterial pressure (expressed in mmHg) during the heart's systole, or ventricular contraction. Diastolic blood pressure (DBP) is the intra-arterial pressure during the heart's diastole, or ventricular dilation.

Numerous techniques for the recording of blood pressure exist. Invasive methods, including the insertion of pressure sensors into the arteries for continuous monitoring, are least often used with human subjects. In contrast, several noninvasive methods are currently used with humans. These methods employ the placement of the occluding cuff on the subject's upper arm and the detection of the Korotkoff sounds at the location of the brachial artery. The inflation of the cuff can be manual (e.g., traditional hand-held sphygmomanometer) or automatic (e.g., Vitastat, Medical Services, St. Petersburg, Florida). The resulting blood pressure determinations are discrete rather than continuous. Good measurement reliability has been established by trained blood-pressure evaluators.

The used of blood pressure measures in the assessment of hyperactivity in one study revealed higher resting levels for both SBP and DBP in hyperactive

children than in normal controls (Ballard *et al.*, 1976). The small but statistically significant differences remain questionable, however, because of the methylphenidate regimen that the clinical subjects followed. In a different research population, Type A children displayed higher SBP reactivity during a difficult cognitive task while using rationalization and active mastery as coping strategies than did Type B children (Smith *et al.*, 1984). More research is needed to substantiate the utility of blood pressure as a diagnostic tool for childhood psychopathology.

### *Skin Temperature*

Skin temperature is yet another measure of physiological arousal, based on the notion that during sympathetic arousal a peripheral vasoconstriction takes place effecting a reduction in the blood supply circulating in the extremities. Accordingly, measures of finger temperature have been used in studies of human psychophysiology (Martin & Venables, 1980). The measure is commonly taken by means of a thermistor, a temperature-sensing device, placed on the index finger. The signal is fed into a low-level DC amplifier and further into a recording and display device. In the assessment of the effects of amphetamines on normal and hyperactive boys, similar finger-temperature decreases were found after drug ingestion during reaction time tasks in both groups (Zahn *et al.*, 1980).

### *Strengths and Weaknesses*

Not unlike the advances made in the area of neuropsychological assessment of childhood psychopathology, the field of physiological assessment has seen far-reaching development. The increase in the sophistication of the assessment methods, coupled with the frequent use of laboratory microcomputers for data collection, has enabled the researcher and the diagnostician to obtain minute-by-minute measures of the physiological concomitants of behavior. This state of affairs has, in turn, facilitated the testing of hypotheses involving heretofore unquantifiable processes (e.g., the physiological concomitants of "focused attention"). Moreover, physiological indices have also been used in the assessment of the effectiveness of pharmacotherapy with conduct-disordered and hyperkinetic children. For example, physiological concomitants of attention span and concentration have been shown to be good predictors of the response of hyperkinetic children to drugs (Barkley, 1976).

However, within their strengths lie also the weaknesses of the physiological methods. All too often, researchers or diagnosticians assess the subject's response to a single stimulus or to a single class of stimuli instead of undertaking a global physiological assessment of the child's responsiveness. The use of several physiological indices, as well as a wide range of stimuli and tasks, is necessary for the formulation of a reliable physiological profile of the assessed. Further, it is recommended that the tasks used in the assessment of the child closely approximate "real-life" situations and require the use of skills necessary for everyday functioning. Numerous studies have overlooked this indication. Last, and

most important, one has to remember the technological limitations and the still unanswered questions regarding the link between behavioral deficits and the underlying physiological mechanisms. The use of labels such as "delayed CNS maturation," "diminished cortical processing", or "deficient focused arousal" may be somewhat premature and lacking in substantiation.

## BIOCHEMICAL METHODS

The last decade has seen developments in the field of biochemical hypotheses advanced as partial explanations of several childhood psychopathologies. Whereas some theories are based on extrapolations from adult psychopathology, others are specific to conditions occurring only in children. Several biochemical assessment procedures have been developed to test these hypotheses. From a review of the literature describing these methods, it becomes apparent that most assessment techniques are based on analyses of CNS metabolites, neuroendocrine responses, allergic reactions and food toxicity, and the effects of toxic trace elements. Some of the most current methods are described below, excluding their minute technical details.

### *Central Nervous System Metabolites*

#### *3-Methoxy-4-Hydroxyphenylglycol (MHPG)*

Central nervous system (CNS) norepinephrine (NE) has been known to maintain a wide range of behaviors, including aggression, motor activity, sleep, arousal, memory, learning, and anxiety (Cooper, Bloom, & Roth, 1982). These behaviors have been known to be widely affected by the ingestion of psychotropic drugs (Seiden & Dykstra, 1977). MHPG, a metabolite of NE thought to reflect CNS NE activity, has been measured in childhood depression (McKnew & Cytryn, 1979), in attention deficit disorder with hyperactivity (Brown, Ebert, Hunt, & Rapoport, 1981), in infantile autism (Young, Cohen, Caparulo, Brown, & Maas, 1979), and in congenital sensory neuropathy with anhydrosis (Shekim, Dekirmenjian, Daniel, & Koresko, 1980). This metabolite can be found in cerebrospinal fluid, plasma, and urine.

Because of the ethical considerations and the methodological complications of obtaining cerebrospinal fluid from children with psychiatric problems, and because of the diurnal changes observed in MHPG, the most often used assessment method is the measurement of 24-hour urinary excretion of the metabolite. However, it is still unclear what percentage of urinary MHPG is derived from CNS NE and what is contributed by the sympathetic peripheral nervous system. Urinary MHPG has also been found to be positively correlated with age, body surface, and urinary creatinine in normal children (Shekim, Javaid, Rutledge, Bylund, & Davis, 1984). Boys excrete higher levels of MHPG than girls.

The measurement of urinary MHPG in children has become increasingly popular in the last decade because of its potential utility in the diagnosis of several childhood psychopathologies. To date, pertinent findings show a gener-

ally decreased level of CNS NE-derived MHPG in autistic children (Young *et al.*, 1979), in response to various types of stress in normal children (Sweeney, Maas, & Heninger, 1978), in chronic depression (McKnew & Cytryn, 1979), in a hypomanic child (McKnew & White, 1974), and in hyperactive children (Shekim, Javaid, Dekirmenjian, Chapel, & Davis, 1982). The reliability of these measurements has yet to be established unequivocally.

### *Dopamine- $\beta$ -Hydroxylase (D $\beta$ H)*

D $\beta$ H is an enzyme involved in the conversion of dopamine into norepinephrine and is present in the plasma at genetically-determined constant levels from about age 6 (Ciaranello & Boehme, 1981). Although it is still unclear whether its presence in the plasma is related to central or peripheral noradrenergic activity (Rush & Geffen, 1980), a deficiency in D $\beta$ H may well be related to the dopamine hypothesis of schizophrenia and to the norepinephrine hypothesis of depression. Biochemical theories would predict lower levels of D $\beta$ H activity in autistic children than in normal controls (Young, Kyprie, Ross, & Cohen, 1980), elevated D $\beta$ H levels in functional psychosis (Belmaker, Hattab, & Ebstein, 1978), and elevated levels of D $\beta$ H in children with attention deficit disorder (Mikkelsen, Lake, Brown, Ziegler, & Ebert, 1981). Finally, a recent study found lower plasma D $\beta$ H levels in children with conduct disorders (undersocialized) than in children with conduct disorders (socialized) and normal controls (Rogeness, Hernandez, Macedo, & Mitchell, 1982). Findings, however, are still quite disparate.

The method used to measure D $\beta$ H levels in the plasma is highly technical and involves conducting a photometric assay of plasma samples drawn periodically (for up to a year) to obtain meaningful reliability coefficients (e.g.,  $r = .97$  after one year). Details regarding the assay can be found elsewhere (Nagatsu & Udenfriend, 1972). This specific assay was used to differentiate two groups of children hospitalized for psychiatric reasons (Rogeness, Hernandez, Macedo, Mitchell, Amrung, & Harris, 1984). The group that evinced zero plasma D $\beta$ H levels displayed significantly higher levels of aggression and disturbance than did children with higher plasma D $\beta$ H levels ( $>15 \mu\text{M}/\text{min}/\text{L}$ ).

Consideration must be given to the medical regimens administered to the assessed patients and their effect on plasma D $\beta$ H. Whereas Fujita, Ito, Maruta, Teradaire, Beppu, Nakagami, and Kato (1978) found no significant effects of neuroleptics on plasma D $\beta$ H activity, DeLisi, Phelps, Wise, Apostoles, Bigelow, & Wyatt (1981) found a 27% decrease in D $\beta$ H associated with these drugs. Also, Rapoport, Quinn, and Lamprecht (1974) found that methylphenidate and imipramine increased D $\beta$ H activity. Given further investigation, this index could prove very useful in predicting symptomatic clusters in children with psychiatric disorders.

### *Phenylethylamine (PEA)*

$\beta$ -Phenylethylamine (PEA) is a monoamine present in the brain and synthesized in the tissue by the decarboxylation of phenylalanine. It also has a struc-

ture almost identical to that of amphetamine. Whereas, compared to catecholamines, the urinary and brain concentrations of PEA are very low, the exact role of PEA in normal humans is not known. However, increased urinary PEA excretion was found in paranoid schizophrenics (Potkin, Karoum, Chuang, Cannon-Spoor, Phillips, & Wyatt, 1979) and decreased PEA in adult depressives (Sabelli & Mosnaim, 1974). Also, the administration of amphetamine to children with attention deficit disorder resulted in a significant increase in urinary PEA excretion.

Urinary PEA excretion is measured over a 24-hour period. Urine collections are made under the supervision of staff in order to obtain the entire quantity excreted. Samples are analyzed by means of a gas-chromatographic-mass-fragmentographic method. Details of this procedure and necessary instrumentation can be found elsewhere (Karoum & Neff, 1982). The assayed compounds usually include PEA, creatinine, and tyrosine. In order to control for the dietary effects of protein ingestion, urinary excretion of phenylalanine (the precursor amino acid from which PEA is derived) is also measured.

Preliminary studies (Zametkin, Brown, Karoum, *et al.*, 1984a; Zametkin, Karoum, Rapoport, Brown, & Wyatt, 1984b) found that children with attention deficit disorder with hyperactivity excreted less PEA over a 24-hour period than did normal controls matched for age and gender. Urinary excretion of phenylalanine was not significantly different. Although the underlying mechanism for these findings has not been identified yet, it appears that urinary PEA could serve as a diagnostic marker for some childhood disorders.

### *Platelet 5-Hydroxytryptamine (5-HT)*

The metabolite of serotonin, 5-HT, has been found in increased levels in the blood platelets of patients diagnosed with infantile autism (Boullin, Coleman, & O'Brien, 1970). Consequently, the blood platelet was considered a model comparable to the neuron in the CNS, reflecting the activity of the metabolite in the brain's reticular formation. Attempts have been made to use blood-platelet 5-HT uptake and efflux as a diagnostic marker for childhood psychosis (Boullin, Coleman, O'Brien, & Rimland, 1971; Rimland, 1976). The complicated laboratory procedure involved in cell resuspension and liquid scintillation spectrometry will not be detailed here. Although elevated serotonin efflux was found in platelets of infantile autistic children in the aforementioned studies, other researchers (Yuwiler, Ritvo, Geller, Glousman, Schneiderman, & Matsuno, 1975) failed to replicate these findings, leaving the diagnostic utility of 5-HT equivocal.

## NEUROENDOCRINE RESPONSES

### *Dexamethasone Suppression Test*

The controversy over the existence of childhood depression as a separate diagnostic category from the adult disorder may yet resurface. Nevertheless, the biochemical assessment of depression in children and adults alike has focused

on hypothesized abnormalities in the hypothalamic-pituitary-adrenal axis. The most consistent observation regarding the neuroendocrine response of the depressive appears to be the inability to suppress plasma or urinary cortisone (or both) after a dose of 2 mg of dexamethasone. Several studies indicated that the dexamethasone suppression test discriminated secondary unipolar depression from primary depression of both unipolar and bipolar types (reviewed by Schlessler, Winokur, & Sherman, 1980). Patients with bipolar primary depression and those with family-pure depressive disorder evince elevated levels of serum hydrocortisone and frequent nonsuppression of serum cortisol after dexamethasone.

The common procedure for the administration of the dexamethasone suppression test has been described by Carroll *et al.* (1981). The specified dose of dexamethasone (1–2 mg) is given on the evening before the serum-sample-collection day. The plasma cortisol measures are determined by a competitive protein-binding method. Hypersecretion of plasma hydrocortisone has been found in depressive children (Puig-Antich, 1987). In one study (Poznanski, Carroll, Banegas, Cook, & Grossman, 1982), 18 depressive and nondepressive controls were administered 0.5 mg dexamethasone. Whereas 5 out of 9 depressives evidenced abnormal plasma-hydrocortisone-suppression responses, 8 out of 9 controls had normal suppression responses. The diagnostic utility of the suppression test is still being evaluated.

### *Growth-Hormone-Releasing Products*

Depressives with melancholic subtype have been reported to evidence lower growth-hormone-releasing response to insulin-induced hypoglycemia. Assessments of growth-hormone release in response to insulin in children with major depressive disorders were carried out by Puig-Antich (in press). Hyposecretion of growth hormone after insulin differentiated children with melancholic subtype from depressive children with nonmelancholic subtype and nondepressed controls. It has been suggested that the growth hormone test has a higher diagnostic sensitivity for prepubertal depression than for the adult melancholic subgroup (Cantwell, 1982).

## ALLERGIC REACTIONS AND FOOD TOXICITY

Evidence is accumulating in support of specific adverse reactions to food and to its additives in children diagnosed with hyperactive or attention deficit disorder, conduct disorders, and autism. Several links between foods or food additives and behavior problems have been identified. These associations have been considered in the assessment and the prognostic evaluation of children with a variety of behavior problems (Rimland, 1971). Unfortunately, the underlying mechanisms of such links often remain unknown. For example, allergy to wheat in celiac children has been associated with disruptive behavior and autism (Rimland, 1972). Corn, barley, oats, other grain cereals, and milk have been

known to produce severe irritability and disruptive behavior in some children. The assessment of these food allergies by the skin-scratch test, provocative food testing (placement of suspected food substances in high concentration on tongue), or the food-loading test (overfeeding of suspected food after abstinence) has proved, by and large, to be inconclusive (Rimland, 1972).

More recent assessment techniques designed to identify food allergies were described by Trites, Tryphonas, and Ferguson (1980). The radioallergosorbent test (RAST) screens serum samples for the presence of IgE reagenic antibodies. The target serum sample's reaction to specific food extracts is compared to the reaction present in a reference serum. To obtain a range of allergic responses (from 0 = no response to 4 = strong response), the test is carried out against a serially diluted serum. Based on the RAST, Trites and colleagues (1980) reported food allergy incidence rates of 77% in the learning-disabled in contrast to incidence rates of 47% and 38% in hyperactives and emotionally disturbed children, respectively. Strong negative correlations between these allergy scores and performance on neuropsychodiagnostic tests were also reported for these clinical populations.

Nutritional challenge tests have been designed to further assess the relationships between allergic responses to food additives and various behavior disorders in children. Based on the work reported by Feingold (1973), attention has been focused on over 2,000 food additives. The problem is thought to be related to a cross-reactivity of yellow food dye (tartazine) with natural salicylates. This reactivity would result in behavior and learning disturbances. Several studies comparing the Feingold diet (devoid of food additives) with control diets, and comparing challenges with artificial food dye to placebo, found significant reductions in behavior and learning problems after the ingestion of an additive-free diet (Conners, Goyette, Southwick, Lees, & Andrulonis, 1976; Harley, Matthews, & Eichman, 1978). However, recent reviews of pertinent studies have reported inconclusive findings regarding the links between food toxicity and childhood psychopathology (Conners, 1980; Lipton & Wheless, 1981).

### *Toxic Trace Elements*

The search for trace elements and toxic heavy metals in the serum and hair of children with learning disabilities (Pihl & Parkes, 1977), mentally retarded children (Marlowe, Moon, & Stellern, 1983), delinquent and psychotic boys (Rees, 1979), behaviorally disturbed children (Kracke, 1982), and autistic children (Henderson, Brooks, Raynesford, & Upledger, 1980) has become a frequently used tool in the diagnostic armamentarium of the child clinical psychologist. It has been repeatedly established that small quantities of lead in the blood (20–40  $\mu\text{g}/100$  ml blood) can cause behavioral and cognitive impairment in the child (Conners, 1984; Rimland & Larson, 1983). Moreover, even much lower quantities of lead pose a significant hazard (Thatcher, Lester, Ignasias, & McAlaster, 1980).

Analysis of hair strands of children with learning disabilities demonstrated

that 98% of the sample could be differentiated from matched controls based on the trace elements and heavy metal content in the hair (Pihl, 1979; Pihl & Parkes, 1977). The substances detected in greater quantity in learning-disabled children in these studies included cadmium, lead, chromium, magnesium, and sodium. Pihl (1979) suggested that the greatest impairment seems to be associated with a combination of five trace elements.

Elevated levels of lead have also been found in hyperactive children (David, Clark, & Voeller, 1972). More specifically, hyperactive children in whom an organic basis for the disorder had been diagnosed evinced lower levels of lead than those levels found in hyperactives without an apparent cause (David, Hoffman, Sverd, & Clark, 1977). Unfortunately, the correlational nature of most of these studies and the lack of adequate control groups leave these data requiring further replication.

### *Strengths and Weaknesses*

Not unlike the physiological assessment methods reviewed above, the strengths of the biochemical approaches lie in their still unfulfilled promise. Technological developments and the resultant ability to perform a wide range of bioassays of nearly any by-product or metabolite of the nervous system opened the door to identifying the biological substrates of various childhood psychopathologies. General and noninformative diagnostic labels of the past are being replaced with specific biochemical markers. Several of the assessment methods have proved to have a good level of predictive validity. It is becoming increasingly plausible to diagnose and chart a course of treatment for disturbed children based on their bodily reactions to drugs, foods, toxic substances, and so on. The biochemical assessment methods have added a diagnostic modality necessary for a complete and useful diagnostic profile of the child.

Further study of these assessment tools is clearly indicated, however. Numerous studies that have reported on advances in the biochemical assessment of the psychologically disturbed child lack adequate methodology, controls, and information regarding the procedures used. Often, studies are concerned primarily with the mechanics of the assessment and pay little attention to the specific behavioral context of the assessed. Stated differently, it remains difficult to ascertain which specific behavioral dysfunction is associated with the result of a given biochemical assessment procedure. Furthermore, continued replication of the available data is called for to provide for adequate evaluation of the reliability and validity of the various techniques. Last, the complexity and cost involved in the administration of these diagnostic procedures limits their present utility to the consumer.

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# 7 *Behavioral Assessment*

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## INTRODUCTION

Interest in behavioral methods of assessment has been increasing rapidly. Although considerable attention has already been directed toward the assessment of adults, the development and the systematic evaluation of behavioral assessment procedures for children have been slower to evolve. Only in recent years have behavioral procedures been used for either the assessment and diagnosis of psychopathology in children or the evaluation of the effectiveness of treatments designed for children exhibiting behavior disorders (Mash & Terdal, 1981).

Behavioral assessment procedures can be characterized and contrasted with traditional assessment approaches in several ways. The most fundamental difference stems from their theoretical conceptions of human behavior. Traditional assessment is concerned primarily with underlying personality characteristics that are linked to or that "cause" behavior. Assessment practices are directed toward determining intraorganismic variables or traits that typically become the focus of treatment efforts. Actual behavior is important only insofar as it reflects the underlying cause. Behavioral assessment, in contrast, avoids references to underlying traits. Instead, it focuses on the child's behavior, as well as specific circumstances or environmental variables surrounding the behavior; these ultimately become the targets of intervention. Traditional approaches to assessment conceive of behavior as being linked to enduring internal traits or personality characteristics, thus remaining relatively consistent across situations or over time. The behavioral approach, however, makes fewer inferential assumptions about underlying traits and views behavior as a function of environmental determinants; thus, a child's behavior changes as the specific situational factors change.

To a certain extent, these differing assumptions about children's behavior are reflected in the respective assessment techniques. Traditional approaches are typically based on indirect measurement systems (e.g., interviews, projective measures, and sentence completion), whereas behavioral assessment approaches emphasize situational specificity and obtain several direct samples of behaviors across a number of settings, often through behavioral observation. In

this regard it is relatively easy to differentiate traditional from behavioral assessment simply on the basis of the techniques used. However, as child behavioral assessment has been expanded to include a broader range of techniques (e.g., interviews, questionnaires, and self-report instruments), there is considerable overlap in actual assessment practices. With the current emphasis on multi-method behavioral assessment of children (Kratochwill, 1982), the difference between traditional and behavioral assessment lies not so much in the methods *per se* but in the way in which the data derived from assessment methods are interpreted and used. Within a behavioral approach, all assessment data (e.g., self-reports, ratings by significant others, and observed behavior) are viewed as samples of the child's behavior under specific situational circumstances. The data are, most importantly, used to identify both target or problem behaviors and the environmental factors that maintain them. In the case of child psychopathology, the data derived from multiple methods are integrated into a functional analysis of the child's behavior pattern, that is, a comprehensive view of problem behaviors, their environmental determinants, and cognitive mediational variables. This analysis of psychopathological behaviors determines the selection and implementation of appropriate treatment procedures.

Although there has been a lessening emphasis on direct observation as the exclusive procedure in child behavioral assessment, observation of ongoing behavior remains the hallmark of behavioral methods. The focus of this chapter is, therefore, primarily on the use of observational procedures in the diagnosis as well as the evaluation of treatment in child psychopathology. Other assessment methods that may be included as behavioral assessment techniques are the focus of preceding chapters. Specifically, in this chapter, we (1) discuss behavioral diagnosis and classifications in child psychopathology; (2) describe various observational methods and their clinical or research applications with children exhibiting a range of behavior disorders; (3) address the issue of treatment evaluation with particular emphasis on single-case evaluation designs; and (4) conclude with a general discussion of the relative strengths and weaknesses of behavioral assessment procedures in child psychopathology as well as considerations for future directions in clinical applications and research.

## DIAGNOSIS AND CLASSIFICATION

Classification of childhood disorders is an important area of psychological and psychiatric research, theory, and practice. Most contemporary diagnostic systems can be traced to the German psychiatrist Emil Kraepelin (1856–1926), who is credited with developing a system that has had a profound impact on the diagnostic process (Kazdin, 1978). In this regard, Kraepelin's system and his basic approach to mental disorders have been retained, to some degree, in past and current editions of the *Diagnostic and Statistical Manual of Mental Disorders* of the American Psychiatric Association (DSM-I, DSM-II, and DSM-III). In this section, three approaches to the classification of childhood psychopathology are reviewed briefly. First, we review clinically derived systems such as those devel-

oped by the American Psychiatric Association (DSM-I, 1952; DSM-II, 1968; DSM-III, 1980), the Group for the Advancement of Psychiatry (1966), and the World Health Organization (see Rutter, Lebecici, Eisenberg, Sneznevskij, Sadoun, Brooke, & Lin, 1969; Rutter, Shaffer, & Shepperd, 1975; Yule, 1981). A second approach has been based on empirically derived classification efforts and is oriented toward classifying various behavior disorders in children (e.g., Achenbach & Edelbrock, 1978; Quay, 1979). Third, we review some of the behavioral diagnostic and classification systems that are currently proposed in the clinical and applied literature. Each of these approaches is reviewed as it relates to the classification of childhood psychopathology.

### *Clinically Derived Systems*

Clinically derived systems initially evolved out of the observations of clinicians who noted the regularity with which certain characteristics of clients occurred together. These characteristics were organized and served as the basis for a diagnostic category. Although the DSM-III system has evolved from clinical experience, various diagnostic categories have been influenced by years of empirical research.

To aid in the understanding of the context for the development of DSM-III, it is important to provide a brief overview of the efforts to develop criteria for reaching a diagnosis. Initially, a group of researchers at Washington University developed diagnostic criteria for use in psychiatric research (Feighner, Robins, Guze, Woodruff, Winokur, & Munoz, 1972). Although only a small number of disorders (16) were developed, the criteria were designed to permit the identification of homogeneous clinic populations. The importance of these criteria should be considered within the context of the overall unreliability of the diagnostic systems used during that time (e.g., the DSM-II). Because the DSM-II was characterized by a great deal of unreliability, the Feighner *et al.* (1972) criteria were established so that more reliable diagnosis could occur. Subsequently, criteria based on the Feighner *et al.* work were expanded and are referred to as the Research Diagnostic Criteria (RDC; Spitzer, Endicott, & Robins, 1978). The RDC were also developed because of some dissatisfaction with the traditional problems with the DSM-II. In fact, both criteria have been used as a blueprint for the development of the DSM-III.

### *DSM-III*

The DSM-III provides clinicians and researchers with a framework for making a diagnosis of mental, medical, and psychosocial conditions presented by individuals within several diagnostic "axes." The multiaxial diagnostic system used within DSM-III includes the following components:

- Axis 1* Clinical Syndromes. Conditions not attributable to a mental disorder that are the focus of attention or treatment.
- Axis 2* Personality Disorders. Specific developmental disorders
- Axis 3* Physical Disorders and Conditions



*Axes 4 and 5* Available for use in special clinical and research settings and provide information supplementing the official DSM-III diagnoses (Axes 1, 2, and 3) that may be useful in planning treatment and predicting outcome.

*Axis 4* Severity of Psychosocial Stressors

*Axis 5* Highest Level of Adaptive Functioning Past Year (American Psychiatric Association, 1980, p. 23)

The multi-axial format broadens diagnostic assessment beyond the more clinical syndromes apparent in earlier classification systems. Chapter 3 of this book provides an overview of the major child and adolescent diagnostic categories of the DSM-III.

### *Considerations in Use of Clinically Derived Systems*

One of the major concerns over the development and use of DSM-III is that it embraces a categorical approach to the diagnosis of disorders. This is reflected in the following perspective offered by Spitzer, Sheehy, and Endicott (1977):

The justification for using a categorical approach in DSM-III which treats psychiatric conditions as separate entities, noting entity status if not denoting it, lies in the practical utility of such typology for communication, treatment, and research, despite theoretical limitations. Furthermore, the history of medicine attests to the value of categorical subdivision in the discovery of etiology in treatment. (p. 6)

In this regard, many of the criticisms of the DSM systems have surrounded the medical conception of diagnosis. For example, Begelman (1976) noted nine criticisms of the DSM systems:

1. Relying excessively on the medical model of abnormal behavior.
  2. Facilitating the stigmatization of individuals.
  3. Employing debatable theoretical notions.
  4. Demonstrating poor or low reliability and validity.
  5. Having little relevance toward prognosis, treatment, and future prediction of behavior.
  6. Dehumanizing the client/therapist relationship.
  7. Exhibiting poor consistency of categorical groupings.
  8. Promoting biases that stem from arbitrary decision rules.
  9. Promoting a perception of homogeneity among individuals labeled the same.
- (pp. 23–24)

One of the major criticisms of DSM-III has been advanced by McReynolds (1979), who noted that the medical model is no longer useful in application to social-psychological problems. In addition, McLemore and Benjamin (1979) noted that the DSM-III system relies very heavily on clinical judgment despite the use of global ratings of the severity of psychological stressors and the clients' highest level of adaptive functioning during the past year. They also noted that DSM-III can be criticized for categorizing individuals in terms of broadly defined illnesses. Like McReynolds (1979), they also noted that DSM-III generally neglects social-psychological variables in the diagnosis of interpersonal behavior.

Perhaps one of the major criticisms of DSM-III is that it is somewhat imprecise with respect to prevalence estimates of the various childhood disorders (Yule, 1981). Yule drew attention to the meaninglessness with which attempts

are made to show prevalence estimates of various disorders (e.g., separation anxiety disorder is considered "apparently not uncommon").

Despite these difficulties, the DSM-III system does have several positive features (Kazdin, 1985). First of all, it is somewhat atheoretical despite embracing a medical model in that emphasis is placed on symptoms rather than on the etiology of the problem. For example, in the case of elective mutism, various characteristics of children who display this disorder are described and could become the focus of treatment independent of theoretical persuasion. Second, each disorder is accompanied by a rather comprehensive description, including such factors as age of onset, course, impairment, familial patterns, and criteria for differential diagnosis. Unfortunately, in the childhood area, there is little information on many of these dimensions. Third, it is apparent that specific diagnostic criteria are available for disorders even though many are based on global and subjective opinion. Fourth, as emphasized above, the system is multi-axial, including various facets of the problem and circumstances that may be relevant to treatment planning.

Kazdin (1983) also emphasized that it is important to take into account the diagnostic levels of understanding and interpretation of the DSM-III system in behavioral assessment. In fact, he argued that the various diagnostic levels of understanding can help behavior therapists to use the DSM-III system to identify target behaviors for treatment and even to consider the covariation among different target behaviors (Kazdin, 1982). The first level of understanding is the notion of *symptom*, which refers to specific overt behavior, affect, or cognition or some other indication that the individual has some type of presenting problem. Second, DSM-III can be analyzed in terms of *syndromes*, or the constellation of symptoms that covary within a particular disorder. As Kazdin (1983) emphasized, the concept of *syndrome* is not necessarily associated with a disease model but can be empirically described in terms of general behavior disorders studies (see our later discussion of behavior disorders studies). A third level of understanding is associated with the concept of a *disorder* that extends beyond the notion of a syndrome and apparently depends on the hierarchical organization of the condition. For example, in the case of an affective condition, an individual would order affective disorders hierarchically ahead of anxiety disorders because the features of the latter occur in individuals with the affective disorders, but not necessarily in reverse. Finally, the concept of *disease* can be considered within the DSM-III system where there is an identifiable underlying physiological basis for the problem (e.g., mental retardation). Although DSM-III does not embrace a disease model, it is important to realize that medically related disorders have certain disease courses that are important to understanding their treatment and prognosis. Perhaps one of the major advantages of DSM-III is that it provides some way of organizing a wide variety of childhood and adolescent disorders for research purposes.

### *General Behavior Disorders Studies*

An alternative approach to the DSM-III system is based on multivariate or empirically derived statistical approaches that serve as an organizational scheme

for a variety of child and adolescent problems. This rather large literature has been developed by researchers using a variety of rating scales and checklists to sample problem behavior (Achenbach, 1974; Achenbach & Edelbrock, 1978; Quay, 1979; Ross, 1980; Yule, 1981). In one of the early studies in this area, Ackerson (1942) identified 125 behavior problems that were recorded in case records of a sample of 3,000 male and female children between the ages of 6 and 17. Ackerson (1942) computed the intercorrelations among the various behavioral problems and found that there were a number of disorders that tended to be highly interrelated. More recent reviews of this literature (e.g., Quay, 1979) suggest that a number of dimensions of behavior occur regardless of the data used and the child sample employed. These usually consist of conduct disorders, anxiety withdrawal, immaturity, and socialized aggression. Other writers have found two broad dimensions of behavior consisting of uncontrolled (e.g., aggression and conduct disorder) and overcontrolled (e.g., inhibited and shy-anxious) (Achenbach & Edelbrock, 1978; Ross, 1980).

Several positive features of the multivariate statistical approach to the classification of behavior disorders have been identified (Kazdin, 1985; Quay, 1979; Ross, 1980). To begin with, in contrast to the DSM-III system, empirical data are gathered to support the dimensions that exist on various observable constellations of behavior. In fact, this form of classification system permits some estimation of the reliability of the various dimensions. Ross (1980) also noted that the multivariate statistical approaches permit a reliable and valid method for classifying the behavior of children and that such an approach confirms that the behavior of such children is not qualitatively different than the behavior of normal children. That is, these behaviors lie on a continuum, and the dimension of having too much or too little emphasizes the impact of judgment from significant others in the diagnostic decision-making process. The development and refinement of various assessment devices represent another significant positive feature of these approaches (Kazdin, 1985). Within this context such assessment devices as checklists and rating scales can sample a broad range of symptomatic behaviors that might be missed through other approaches.

Despite these positive features a number of significant limitations have also been noted. To begin with, the various symptoms that are identified could reflect the types of subjects used in this line of research (Ciminero & Drabman, 1977). This is really a problem of generalizability and may be addressed in future research in this area. Second, some concern has been expressed about the use of factor analysis in the development of classification systems (Yule, 1981). It is apparent that certain clusters of behavior can be labeled quite differently across various investigations (Ross, 1980). Moreover, it is possible that, depending on how the items are developed in the scales, certain behavior dimensions may not emerge. A third problem with work in this area is that the methods of assessment are indirect in that they do not depend on the observation of behavior in the natural environment. Few studies have made comparisons of the various checklist ratings with direct observation of the child's behavior in home and school settings to validate the classification systems. The major positive feature of the general behavior disorders approach is the consistency with which many different individuals have found similar types of behavior problems. In addition,

the general behavior disorders studies provide a much more comprehensive evaluation of various diagnostic categories of child and adolescent psychopathology when compared to the DSM-III system (Kazdin, 1985).

### *Behavioral Classification Systems*

Traditionally, behavior assessors have taken a very negative perspective on traditional diagnostic classification systems. In fact, behavior therapists have typically adopted traditional diagnostic systems out of clinical convenience rather than actively embracing any particular system. In contrast to traditional diagnosis, behavioral assessors have tended to analyze child and adolescent problems in terms of deficits, excesses, inappropriate stimulus control, and aversive response repertoires (e.g., Bandura, 1969; Bijou & Grimm, 1975; Kazdin, 1985; Kratochwill, 1982). An example of this approach is the perspective of Marholin and Bijou (1978), who noted that "diagnosis or assessment is . . . oriented towards obtaining the kinds of information or data that can be directly used to *develop and guide a treatment program*" (p. 15).

It is important to reemphasize that the behavioral approach tends to depart from traditional diagnosis in terms of embracing specific diagnostic categories and of using underlying dynamics to explain behavior. In contrast to the adherents of traditional systems, behavioral assessors typically focus on specific target behaviors and on the environment in which the individual performs.

Over the past several years, several formal classification systems have been developed for use in research and practice by behavioral assessors (Adams, Doster, & Calhoun, 1977; Kanfer & Saslow, 1969; McReynolds, 1979). One of the more formal diagnostic assessment models was originally developed by Kanfer and Saslow (1969). These authors identified seven specific areas that can be used to guide assessment across many different types of childhood and adolescent problems:

1. *Initial analysis of the problem situation*, in which the various behaviors that brought the client to treatment are specified.
2. *A clarification of the problem situation*, in which various environmental variables are specified.
3. *A motivational analysis*, in which reinforcing stimuli and punishing stimuli are identified.
4. *A developmental analysis*, in which biological, sociological, and behavioral changes of potential relevance to treatment are identified.
5. *An analysis of self-control*, in which the situations and behaviors the client can control are identified.
6. *An analysis of social situations*, in which the interpersonal relationships of the individuals in the client's environment and their various aversive and reinforcing qualities are specified.
7. *An analysis of the social-cultural physical environment*, in which normative standards of behavior and the client's opportunities for support are evaluated. (pp. 433–437)

This model provides information on targets for the modification of behavior and a framework for organizing a client's behavior during assessment and treatment. Nevertheless, it does not provide a method of combining the data (Dickson, 1975).

Another system, called the Psychological Response Classification System (PRCS), is designed to classify responses rather than clients (Adams *et al.*, 1977). The PRCS is similar to many of the multivariate statistical techniques described above. In the development of the PRCS system, Adams *et al.* (1977) conceptualized a motor-perceptual, biological, cognitive, and emotional response system format. The PRCS system has some specific aims that are delineated as follows:

One is to take arbitrary assumptions regarding distinctions between normal and abnormal responses out of the alpha level of classification. Unless it is empirically demonstrated to be otherwise, abnormal behavior is considered to be an extension of normal behavior and similar in kind. Many difficulties have arisen from attempts to classify symptoms as distinct from nonsymptomatic behavior. It is not the proper role of the alpha level classification scheme to make value statements about what is normal and abnormal. Abnormal behavior can be defined only in the context of what is normal, which is an empirical question. (p. 67)

Thus, like some of the advantages that have been proposed for the multivariate classification schemes discussed above, the PRCS conceptualizes deviant behavior as falling on a continuum with normal behavior.

Another system (McReynolds, 1979) is a "social behavioral classification system" of behavioral disturbances. The approach incorporates a social-psychological perspective in that clients are identified for treatment because their actions are presumed to be disturbing to themselves or to others. In this regard, one individual presents a behavioral disturbance to another in two ways. First, "the first person(s)' actions disturb the second since it is the presence of responses or behavior patterns that is disturbing." Second, "there is an absence of specific responses or response patterns, and the failure of the designated deviant to engage in certain behaviors poses the disturbance" (McReynolds, 1979, p. 120). Behavior is then classified as an excess or deficit on five behavioral dimensions (frequency, duration, magnitude, latency, and context). Moreover, behavior is divided into cognitive, affective, motor, and psychosomatic actions. The  $2 \times 5 \times 4$  classes allow the identification of 40 behavioral events that can be used to identify deviant behavior.

The aforementioned behavioral classification systems provide some interesting alternatives for the classification of psychopathology in children. It must be emphasized that each of these systems has generally grown out of a dissatisfaction with some of the traditional schemes that have been employed in the clinical literature (e.g., DSM systems). Yet, despite some possible advantages that these systems may have, there is a paucity of research to support their use in both research and practice. In almost all cases, we do not have information on the reliability and the validity of these approaches (Kazdin, 1985).

## OBSERVATIONAL METHODS IN ASSESSMENT OF CHILD PSYCHOPATHOLOGY

### *Descriptions of Observational Methods*

As noted earlier, *behavioral assessment* refers to a diverse set of methods that vary in terms of focus, clinical application and utility, and psychometric proper-

ties. Cone (1978) made a distinction between indirect and direct assessment methods. Indirect procedures include interviews, questionnaires, ratings, and checklists, involving self-reports as well as reports from others. Several of these methods of assessment have already been addressed in other chapters of this volume. Such assessment methods are considered indirect in that measures of relevant behaviors are obtained at a time and place different than when the actual behaviors occur. Interviews and self-reports provide verbal descriptions of the target behaviors; other-reports, ratings, and questionnaires provide retrospective descriptions in which a significant person in the child's environment (parent or teacher) evaluates or provides information relative to a child's behavior based on previous observations. Direct assessment procedures, however, allow for the assessment of clinically relevant behaviors at the actual time and place of their occurrence. These direct methods include naturalistic observation, analogue assessment, participant monitoring, and self-monitoring. This section focuses specifically on these direct observation procedures, including their clinical and research applications with several categories of childhood behavior disorders. A wide range of observational procedures have been used in assessing children exhibiting diverse problems. An extensive discussion of several methodological issues surrounding the use of these procedures is beyond the scope of this chapter; however, sensitivity to the issues discussed is a critical part of any observational assessment of children.

### *Naturalistic Observation*

Direct observation of a child's behavior in his or her natural environment is at the core of behavioral assessment techniques in child psychopathology. Naturalistic observations provide a sample of the child's behavior in the environment where the behaviors have been identified as being a problem (e.g., home or school). Because target or "abnormal" behaviors of the individual child are operationally defined, are observed by trained observers or clinicians who may not be part of the natural environment, and are recorded according to a specified set of rules, naturalistic observation is considered the least inferential of the available assessment techniques. Furthermore, because child behaviors are often influenced by other significant individuals or stimuli and events in the environment, naturalistic observation systems typically include the recording of these environmental factors, thus allowing for an assessment of the functional relationship between psychopathological behaviors and antecedent or consequent variables that may be maintaining their occurrence.

The distinguishing characteristic of naturalistic observation, as noted above, is that a direct sample of behavior is obtained. There are a variety of techniques for recording behaviors that frequently incorporate some time-sampling component in which observation periods are divided into several shorter intervals or segments. The recording of the number of times a discrete behavior, such as a tic, occurs within a specific interval of time is a frequency count. For example, Barton and Madsen (1980) recorded the number of times a mentally retarded child wiped his face during each treatment-observation session, thus obtaining a frequency measure of his excessive drooling. Interval recording also yields

information concerning the rate of occurrence of a behavior; however, the rate is typically expressed in terms of the number or percentage of time intervals during which the behavior occurs. Continuous, frequent behaviors, such as self-stimulatory behaviors, are most appropriately recorded by means of interval recording. Romanczyk, Kent, Diament, and O'Leary (1973) described a behavioral observation system using interval recording in which several disruptive classroom behaviors are observed simultaneously during 20-second intervals. Observers circle the codes for behaviors that occur during each interval.

When target behaviors are discrete and of relatively long duration, such as temper tantrums, a duration recording may provide more relevant diagnostic information. Duration recording involves a direct measure of the amount of time (usually measured with a stopwatch or an electronic timing device) during which a child engages in a behavior. For example, Sanok and Ascione (1978) measured the time that elapsed between placing food on a 5-year-old girl's plate and having no food remaining on the plate. This duration measure was deemed appropriate in that the length of mealtimes had been targeted as one of the most troublesome aspects of the child's behavior. A related duration measure, latency recording, allows an assessment of the amount of time that elapses between a particular event or stimulus and the onset of the response. The number of minutes it takes for a noncompliant child to respond to a request from his or her parents and the number of seconds that elapse between a clinician's question and an autistic child's verbal response are examples of latency recording.

Finally, continuous or high-frequency behaviors are often recorded by means of a momentary time-sampling procedure. With this observational method, the observer notes the occurrence or nonoccurrence of a particular behavior at a predesignated point in time. Kubany and Sloggett (1973) described a momentary time-sampling procedure in which a teacher was signaled by a timer every 4, 8, or 16 minutes to note whether a target child was displaying non-disruptive behavior at the time of the signal.

Although direct naturalistic observation is a preferred method for the assessment of behavior disorders in children, several sources of error are associated with naturalistic observation (Hartmann, 1984; Haynes, 1983; Kratochwill, 1982). First, error in observational measures may be attributed to the observers themselves, especially when the observers are significant adults in the child's environment, such as parents. Sources of error within observers may be due to inadequate training with the observational system, observer bias or drift, or the extent to which the observer's characteristics or behavior may affect the target child's behavior (Wasik & Loven, 1980). Second, the data derived from naturalistic observations may be influenced by the observational procedures (e.g., the complexity of the coding system, the specificity with which clinically relevant behaviors are defined, and the method of recording observations), as well as environmental variables (e.g., the context in which the observation occurs or the scheduling of observation periods) (Foster & Cone, 1980). Finally, a source of error particularly relevant in naturalistic observation, which is independent of the observers or the observational techniques, is reactivity. Reactive effects occur when the actual process of observing behavior in itself alters the characteristics

or rate of the observed behavior. Reactivity poses a threat to the validity of the resulting observations; that is, the sample of behavior derived from naturalistic observations may not be representative of the behavior when it is not observed (Haynes & Horn, 1982).

Despite these methodological issues, naturalistic observation does provide valuable information for child behavioral assessment. Cost-efficiency factors are clearly important when considering the use of naturalistic observation. One disadvantage of behavioral observations in the natural environment is that the target behavior may not occur during the designated observation periods; thus, the use of naturalistic observation may become time-consuming and expensive. These concerns have resulted in the development and the increased use of alternative ways of collecting data about the behavior that generalize to the natural environment.

### *Analogue Observation*

Rather than observing a child's behavior in the natural environment, observations can be made in an analogue or simulated setting. Analogue observation involves the direct observation of children's behavior in settings that are structured specifically to occasion the target behavior. Typically, the child is requested to role-play or to behave as if she or he is in the natural environment. Analogue observations are particularly useful when the target behavior is of low frequency or is subject to reactivity and thus may not occur in the naturalistic setting during a designated observation period. It is also useful when the target behavior is difficult to observe in the natural environment because of physical restraints. An additional advantage of analogue assessment is that it affords more control and standardization of salient situational or task variables than the natural environment.

Analogue observations may involve situation analogues, in which the child is assessed in simulated situations or environments such as a simulated school setting (Allyon, Smith, & Rogers, 1970) or a structured playroom (Rekers, 1975), or stimulus analogues, in which the child is assessed interacting with relevant stimulus persons or objects typically present in the natural environment, such as role playing. Matson and Ollendick (1976) used analogue assessment procedures to observe instances of low-frequency biting in children. The parents reported that biting occurred when the children did not get their own way and became frustrated. Play sessions were simulated during which parents deliberately took toys away from the children. These structured play settings were designed to increase the probability that biting would occur and therefore facilitated the observation of the otherwise low-rate behavior that was targeted for treatment.

Observational methods used in analogue situations are similar to the methods described for use in naturalistic settings and involve the recording of the occurrence of operationally defined behaviors during short time intervals. Analogue observation is also subject to sources of measurement error similar to those that occur in naturalistic observation. One major concern about analogue



assessment is its criterion-referenced validity and consequent degree of generalizability from the contrived setting to the natural environment (Bellack, Hersen, & Lamparski, 1979; Hughes & Haynes, 1978). For example, observations and ratings of children's assertive behaviors during analogue role-play situations were not found to be strongly associated with observations in naturalistic settings (Van Hasselt, Hersen, & Bellack, 1981). Conversely, Reisinger and Ora (1977) documented strong agreement between observations of mother-child interactions obtained in analogue clinic settings and those obtained in the natural home environment. Thus, although an examination of the external validity among researchers has not revealed consistent results, Foster and Cone (1980) noted that the threat to generalizability of analogue observational data does exist, and that clinicians who use analogue observations should attempt to identify and control those variables that affect generalizability. According to Nay (1979), the correspondence between analogue and naturalistic observation settings varies as a function of the similarities in their physical characteristics, in the individuals who are present, and in the obtrusiveness of the observation procedures. Therefore, a check on the validity of the analogue observations should be made initially by comparing the target behavior's occurrence in the contrived setting with its occurrence in the natural environment.

In brief, analogue observations provide several assessment options for children exhibiting behavior disorders. Relative to naturalistic observations, analogue assessment may be less costly and more efficient for the clinician interested in obtaining data relevant to specific target behaviors.

### *Participant Observation*

Another alternative to the use of naturalistic observation, in which observers trained in the use of observational coding systems conduct the observations, is to have individuals who are normally part of the child's environment (e.g., parent, teacher, or caretaker) observe and record the child's behavior. Participant observation or monitoring has frequently been used to decrease the expense of naturalistic observation and to reduce the potential reactivity to obtrusive observational procedures. For example, Wells, Griest, and Forehand (1980) successfully taught parents to monitor their own behavior as well as their children's behavior after the initial identification of two or three target behaviors of concern to them. In addition, Wells *et al.* had parents record classes of events occurring before and after the target behaviors to obtain information relative to a functional analysis of the behaviors.

As with analogue observation, participant observation has several clear advantages over naturalistic observation. It is a cost-efficient method of gathering assessment data that are useful for evaluating low-rate behaviors or behaviors that may be highly reactive to external observers. Although it may appear particularly promising for clinical assessment, participant behavioral recording is subject to several sources of error that can limit its utility. Perhaps the greatest potential sources of error are those related to observer characteristics, especially observer bias and observer inaccuracy. Wells *et al.* (1980), for example, reported

only moderate correlations (.47 to .64) between parental recorded behavior of children and independent observer ratings of the same behaviors. Haynes and Wilson (1979) attributed observer bias to several factors, including (1) the history of interaction between the observer and the child; (2) the influence of a diagnostic label placed on the child, such as autistic, retarded, or hyperactive; and (3) the anticipated use or potential impact of the observational data. Observer inaccuracy is most often attributed to insufficient or inadequate training. Although Broden, Hall, and Mitts (1971) suggested that a high degree of accuracy in participant observation (specifically, parental monitoring) may not be necessary to obtain treatment effects, it is important if the observational data are used for the assessment of psychopathology in children. Clinicians, therefore, need to focus considerable attention to the development of techniques to train participant observers when observational data are used as the primary source of assessment information. The susceptibility of participant observation to observer bias justifies its use as a supplementary rather than a primary assessment procedure.

### *Self-Observation*

Self-monitoring is another direct method of assessment that requires the child to observe his or her own behavior and then to record its occurrence. Thus, like the other observation procedures described, it involves observation and recording of clinically relevant behaviors at the time of their occurrence. Many different types of recording devices have been used with children, including diaries for narrative recordings, counters or check marks for frequency counts, and meters or timers for duration recordings (Kratochwill, 1982). Although self-monitoring procedures have been used successfully with both children and adults, Shapiro (1984) offered several considerations when using self-observation with young children. These are also particularly relevant to its use with children of all ages who exhibit behavior disorders. First, the target behaviors should be clearly defined and understood by the child. This can be achieved by providing descriptions or pictorial representations of the target behaviors that are appropriate to the child's level of comprehension, and by limiting the number of target behaviors to no more than two at a time. Successful self-monitoring is facilitated through the use of uncomplicated recording procedures for simple, well-defined behaviors. Second, children should be prompted with appropriate visual or verbal-auditory cues (e.g., tape-recorded tones) to use the self-monitoring procedure. Finally, reinforcement contingencies for accurate self-observation and self-recording increase the overall accuracy of the self-monitoring procedure.

Specific methods of self-monitoring reported in the literature have varied considerably, depending on the characteristics of the children, the dimensions of the target behavior, and aspects of the environment. Furthermore, self-monitoring has been used with a wide range of behaviors and has been applied to a variety of child populations, including retarded, emotionally disturbed, and hyperactive children. Kunselmann (1970), for example, described the use of

simple stick-figure drawings representing the target behaviors to be observed by the child. Children placed a mark next to the appropriate picture whenever the target behavior occurred. Shapiro, McGonigle, and Ollendick (1980) used a self-monitoring procedure with mentally retarded and emotionally disturbed children who observed and recorded their own on-task behavior by placing stars on assignment sheets. Children have also self-recorded the occurrence of nervous tics by putting tally marks on an index card they carried in their pockets (Ollendick, 1981).

As with the other observation procedures, there are concerns related to the reliability and the validity of self-monitoring. The most prevalent threat to the validity of self-monitoring is reactivity. Self-monitoring often results in a behavior change in the child because of the self-observation process. These reactive effects may be so influential that self-monitoring in itself is frequently used as an intervention technique (Kratochwill, 1982). Reactivity is a primary concern in assessment because it alters the resulting estimates of the target behavior, which may not accurately reflect the child's behavior when he or she is not self-monitoring. Several factors have been identified that may influence the occurrence of reactive effects. Because reactivity occurs inconsistently within children, it is important to understand and ultimately to control these factors that affect reactivity. Such factors include the valence of the target behavior (e.g., desirable behaviors increase while undesirable behaviors decrease following self-monitoring), the reinforcement contingencies associated with accurate self-monitoring, the nature of the recording device (e.g., Nelson, Lipinski, & Boykin, 1978, found greater reactivity with hand-held versus belt-worn counters), and the time between the behavior's occurrence and its recording (Hayes & Cavior, 1980; Nelson, 1981).

An additional concern with self-observation is accuracy. In general, research suggests that children can be trained to be accurate recorders of their own behavior (Shapiro, 1984). Most studies have found acceptable levels of agreement between self-recorded data and data derived from other concurrent assessment procedures (e.g., permanent products, parent-teacher reports, and direct observation). Accuracy can be enhanced by clearly defining the behaviors to be observed, by prompting the self-observation, and by providing reinforcers for accurate self-monitoring. Nonetheless, inaccuracy remains a possible threat to the reliability of self-observational data, particularly among children exhibiting behavior disorders.

In sum, self-observation, involving many different specific recording procedures, represents a direct means of assessing a wide range of child behavior problems. Although there are several issues, including reactivity and accuracy, that need to be addressed, self-monitoring is a clinically useful strategy for child psychopathology assessment and treatment evaluation.

### *Research and Clinical Applications of Observational Methods*

This section presents a sampling of observational techniques developed for the assessment of behaviors in several areas of child psychopathology. The

procedures are representative of the observational methods that have been applied in the empirical and clinical study of various categories of childhood disorders and do not constitute an exhaustive survey.

### *Anxieties and Fears*

Children's fears and anxieties are commonly conceptualized as complex, multiple-component response patterns. Each of three response components (motor, physiological, and cognitive) is typically measured by an instrument whose mode "matches" the component it is intended to assess (e.g., a self-report mode is often used to assess the cognitive component of anxiety) (Cone, 1978). Overt, motoric aspects of fear and anxiety are the most extensively examined of the three response components, particularly among children. Direct observation of the effects of anxiety on motor functioning and ongoing performance is frequently used as a method of behavioral assessment.

One common observational measure of children's fears and anxieties is an analogue method called a *behavioral avoidance test* (BAT) (Lang, & Lazovik, 1963). The procedure may involve asking the child to enter a room containing a fear-eliciting stimulus and then to approach and progressively touch, handle, and engage herself or himself with the object. The logic of the BAT is that the more intense the anxiety, the earlier in the approach sequence the child will initiate escape from or avoidance of the feared object. A passive BAT (for use when the child cannot perform the approach sequence because of physical limitations) has also been designed (Murphy & Bootzin, 1973).

Several observational coding systems have also been developed to measure behaviors presumably associated with anxiety and fear, primarily during naturalistic observations. The Observer Rating Scale of Anxiety (ORSA) (Melamed & Siegel, 1975) was developed for use with children mainly in hospital settings and uses a time-sampling procedure to record the occurrence or nonoccurrence of 29 targeted responses. The Preschool Observation Scale of Anxiety (Glennon & Weisz, 1978) is another observational coding system that notes the presence or absence of 30 behavioral indicators of separation anxiety (e.g., crying, lip licking, and nail biting) among preschool children. Another system is the Timed Behavior Checklist (TBCL; Paul, 1966), which was developed initially for use with adults to measure 20 overt, anxiety-related behaviors (e.g., stammering, pacing, and foot shuffling) during public-speaking situations. Using the TBCL, observers record the occurrence of each behavior during specific time intervals (e.g., 30 seconds). These and other direct observation systems that were designed to assess the motor components of children's fears and anxieties (e.g., Behavior Profile Rating Scale—Melamed, Hawes, Heiby, & Glick, 1975; Post-hospital Behavior Questionnaire—Vernon, Schulman, & Foley, 1966) share a number of the problems discussed earlier with observational techniques (reactivity, reliability, observer drift and bias, and practical expenses). The clinician or researcher interested in these direct observational methods must be aware of such limitations.

*Depression*

Direct observational methods have been reported in the literature for assessing three categories of behaviors commonly associated with depression: verbal behavior, motor behavior, and degree of engagement in reinforcing activities. Because the behavioral assessment literature has paid relatively little attention to depression in children, the following discussion will address observational procedures that have been used to assess depression in adults as potential devices for the behavioral assessment of depression in children.

Several clinical studies have focused on specific aspects of depressed verbal behavior, including slowed rate of speech (Robinson & Lewinsohn, 1973), negative self-references and/or absence of positive self-references (Aiken & Parker, 1965), and inappropriate verbal interactions with others (e.g., few responses, narrow range of interactions, more negative than positive reactions, and slowness in responding to others' reactions; Lewinsohn, Weinstein, & Alper, 1970; Libet & Lewinsohn, 1973). Typically, naturalistic observations are made at home or in group settings; in addition, analogue situations (e.g., structured interviews and simulated phone conversations) or videotaped segments of therapy sessions provide sources of observational data. Although a number of different verbal behaviors have been systematically observed and coded in a variety of experimental contexts, many of these coding systems are impractical for clinical use, and some have not reliably differentiated depressed from nondepressed individuals (Rehm, 1981).

Many of the verbal behavior studies cited above also included observation of nonverbal or motor behaviors (e.g., eye contact, smiling, and head nods). Using primarily observations during structured interviews, researchers have found differences between depressed and nondepressed individuals on several overt behaviors, such as head nods, posture, gestures, smiling, and overall level of motor activity (Friedman & Katz, 1974; Waxer, 1976; Williams, Barlow, & Agras, 1972).

The use of an activity schedule as a depression assessment instrument with children involves self-observation and is based on a behavioral conceptualization of childhood depression that incorporates the concept of reinforcement; the loss of response-contingent reinforcers (Lewinsohn & Graf, 1973) or the lack of reinforcer effectiveness (Costello, 1972) is viewed as the determinant of depressed behavior. The Pleasant Events Schedule (PES) (MacPhillamy & Lewinsohn, 1974) is considered one of the best developed instruments of this type (Rehm, 1981). Activity schedules like the PES are intended to assess the number of extrinsic positive reinforcers that an individual receives. Reinforcement survey schedules, reinforcement observation schedules, and daily activity logs (Mash & Terdal, 1976) are other methods of assessing reinforcer effectiveness and availability for children. Questions about whether these devices are appropriately assessing depression, as well as concerns regarding reactivity of self-recording, may limit their use as diagnostic and behavioral indices of depression.

### *Conduct Disorders*

There are several well-recognized coding systems for the observation and assessment of conduct disorders in children. These are appropriate for use in analogue or structured situations in a clinic as well as in natural settings such as the home or school.

The Behavioral Coding System (BCS) (Patterson, Ray, Shaw, & Cobb, 1969; Reid, 1978) was designed to assess family interactions primarily in home settings; however, it has been extended for use in analogue and school settings. In this system, 29 behavioral categories are observed and coded for each family member during one-hour observation periods. Wahler, House, and Stambaugh (1976) developed an observation procedure also designed to code children's interactions with other individuals in the environment. Within this system, a total of 19 child behavioral categories are observed and coded during 30-minute observation periods. Another observation system (Forehand, Griest, & Wells, 1979) is more restricted in its utility than those developed by Patterson and Wahler because it measures only one category of child behavior: compliance and noncompliance. One final coding system to be mentioned was developed by O'Leary and his colleagues (Kent & O'Leary, 1976). Designed initially for research on children with conduct disorders in classrooms, this procedure allows coding of behaviors that are considered inappropriate specifically within a school setting (e.g., out-of-seat and verbal disruption).

Each of these observation systems was developed primarily for clinical research purposes. Interobserver agreement is uniformly high (75%), and correlations between observations derived from these systems and other measures of the coded behaviors, such as parent or teacher reports, are consistently significant. The obvious disadvantage for clinical use is the costliness in terms of time for therapists or significant adults, who must receive extensive training to observe children's behavior accurately and reliably in natural settings. Nonetheless, observation systems such as these remain reliable and valid assessment procedures for evaluating conduct disorders in children.

### *Hyperactivity*

Several objective measures of children's overall activity level have been reported in the literature (Barkley, 1981). One attempt has been made to construct and validate an observation system to code systematically specific behaviors that differentiate hyperactive from normal children (Abikoff, Gittleman-Klein, & Klein, 1977). This system codes 13 behaviors commonly associated with hyperactive children. Although the Abikoff *et al.* system is methodologically complex and some researchers question whether it is a viable measure of hyperactivity (Haynes & Kerns, 1979), it does represent a noteworthy step toward developing a behavioral code specifically for hyperactivity as a distinct behavioral pattern.

O'Leary, Pelham, Rosenbaum, and Price (1976) used a three-behavior code

system for evaluating hyperactive children in classrooms. Another coding system meant primarily for classroom settings, the Hyperactive Behavior Code (Jacob, O'Leary, & Rosenblad, 1978), includes six behaviors that purportedly reflect restlessness, short attention, and low frustration tolerance. Although they are not as complex as the Abikoff *et al.* system, these measures were developed specifically for research (not clinical) purposes to assess treatment effectiveness and have not received extensive evaluation of their clinical utility.

### *Autistic Behaviors*

A diagnosis of autism is based on the child's exhibiting a majority of the behavioral characteristics typically associated with the disorder. The most salient characteristics of autism include impaired social skills, lack of communication, ritualistic and repetitive behaviors, self-stimulatory behaviors, echolalia, and deficient sensory functioning (Schreibman, Charlop, & Britten, 1983). The use of direct observation techniques, which has increased in popularity in recent years as a viable method of assessing autistic children, necessitates the precise specification of the behaviors that are the focus of assessment and treatment. In addition to the assessment of fairly specific behaviors, there are more global observation procedures for assessing the characteristics of autism collectively as a behavioral syndrome (Newsom & Rincover, 1981). For example, the Multiple-Response Recording system (Lovaas, Freitag, Gold, & Kassorla, 1965) involves the mechanical coding of five behaviors (self-stimulation, bizarre speech, appropriate speech, social nonverbal behavior, and appropriate play) during 35-minute observation sessions. Boer (1968) developed an observation system that does not require the simultaneous observation and recording of multiple behaviors. In this system, eight mutually exclusive behaviors are observed and scored separately, one behavior during each 1-second observation interval. Finally, the Total Behavior Repertoire procedure (Strain & Cooke, 1976) uses a narrative recording technique in which events and behaviors are noted during continuous 10-second observation intervals.

The observational methods described here represent a few of the techniques that have been developed for the assessment of autistic behaviors in children primarily in clinical settings. The multifaceted nature of this disorder has, thus far, prevented the development of a single set of behaviors and techniques of observing them that are applicable to all situations and to all children.

### *Social Skill Deficits*

Concurrently with the growing interest in designing treatment approaches to remediate social skill deficits in children, several assessment procedures for evaluating social skills have been developed. Two types of observation procedures have been used in this regard: naturalistic observation and role-play tests.

Several different codes have been developed for the direct and systematic observation of children's social behavior, initially for research purposes and

more recently for use by practitioners. In one of the earliest coding systems, developed by Hartup, Glazer, and Charlesworth (1967), three global categories of the child's social behavior are coded. Several discrete behaviors (e.g., non-compliance, threats, attention, and approval) are subsumed under the global categories. Another observational coding system, developed by Strain, Shores, and Kerr (1976) for classroom use, records similar social behaviors but distinguishes between children's initiations and reactions or responses and codes the person with whom the child interacted, thus allowing for a more detailed analysis of antecedent events.

Hops and Greenwood (1981) developed several observation coding systems for use primarily by school personnel for the assessment of children's social behaviors. The SAMPLE Observation System (SOS) represents a fairly simple method for counting interactions (i.e., verbal or nonverbal exchanges) among preschool children. The Consultant Social Interaction Code (CSIC) was developed for the observation and recording of social behavior among children on playgrounds.

Many social behaviors may be of low frequency or may occur only in response to specific situations, thus requiring a great deal of observation time in the natural environment to obtain a representative sample. To address this problem role-play tests have been developed for the assessment of specific social skills. Two particular role-play tests, the Behavioral Assertiveness Test for Children (BAT-C; Bornstein, Bellack, & Hersen, 1980) and the Behavioral Assertiveness Test for Boys (BAT-B; Reardon, Hersen, Bellack, & Foley, 1979), involve the presentation of situations designed to elicit positive or negative responses. Scenes are role-played between the child and a model prompt and are videotaped for the coding of a variety of verbal and nonverbal social responses. Although some researchers (e.g., Bellack *et al.*, 1979) have questioned the validity of these tests in measuring social behaviors, role-play observations represent a viable means of assessing components of social behavior in children, particularly in clinical settings or when naturalistic observations are difficult to obtain.

## SINGLE-CASE TREATMENT EVALUATION DESIGNS

### *Characteristics of Single-Case Designs*

Single-case research designs have been used to explore the efficacy of intervention programs applied to many different types of childhood disorders. More important, single-case research designs have been used widely in various applied areas of psychology and education and have been useful in assisting researchers to develop a knowledge base for the treatment of various disorders. Single-case research designs represent one of a number of *experimental* methodologies that can be helpful in elucidating aspects of child and adolescent psychopathology. Single-case research designs have several unique characteristics when examined in light of the various alternative methodologies used in studying psychopathology in children and adolescents.



### *Repeated Measurement*

Single-case designs involve the assessment or measurement of some dependent variable over multiple occasions. Usually, data are collected on a pretest or baseline series (referred to as an *A phase*). Following this phase, one or more intervention phases are implemented. These series are referred to as treatment or intervention phases and are notationally represented by a letter system other than *A* (e.g., *B*, *C*, or *D*).

Repeated measurements may occur on more than one dependent variable. The dependent variables are chosen to best represent the construct under study. Because some constructs are conceptualized by multiple measures, the researcher uses those dependent variables that best represent the construct, given the state of knowledge in a particular area of psychopathology. For example, in the evaluation of a hyperactive child, the researcher has the option of monitoring the activity level (frequency, intensity, duration, and magnitude), engaged time, and the amount of academic work completed, among other measures. In this case, the number and type of repeated measures chosen will vary as a function of practical and cost considerations.

Repeated measurement is not limited to the dependent variable. Sometimes the researcher may wish to measure the independent variable(s) over various phases of the study. This repeated assessment may be of interest when the researcher wishes to monitor the integrity or strength of the intervention and/or when there is interest in determining the covariation between the independent and dependent variables.

It is evident that the choice of a dependent variable will depend greatly on the ability of the researcher to measure it over time. The methodological and conceptual issues surrounding the choice of dependent variables were discussed in more detail in an earlier section of the chapter.

### *Monitoring Variability*

Repeated assessment of the dependent variable over time allows the researcher a unique opportunity to monitor the variability of the data over time. This situation often contrasts dramatically with many group designs in which variance is examined in the context of group data at one or a few points in time. As the dependent variable is monitored over time in single-case designs, fluctuations in the data are usually apparent. Such characteristics of the data as trend, level, and score overlap can be obtained and used in the analysis of the data. The analysis usually takes into account the differences in these characteristics across phases. Specific issues surrounding data analysis are discussed in various books on single-case methodology (Kazdin, 1982).

In addition to observing various characteristics of the data in the time series, the researcher may be able to specify the various conditions surrounding the study. These conditions include, but are not limited to, the features of the independent variable, the settings, and subject and experimenter characteristics.

In some instances, the researcher can systematically vary these conditions to evaluate their influence on the dependent measures. For example, in psychotherapy studies, the researcher may be interested in determining the influence of therapist characteristics such as empathy or reinforcing qualities on certain therapy outcomes. Each of these characteristics may have a bearing on the effectiveness of a certain therapeutic procedure or technique.

### *Design Flexibility*

One of the unique features of a single-case design is the option available to the researcher to change the design during the investigation. Although this option is available to researchers using other experimental and nonexperimental methods, it is a distinct feature and even a major advantage of single-case strategies. In this regard, the researcher using a single-case design has two options available. First, the researcher may plan the design before conducting the study. (For example, an ABAB design may be planned.) The design is developed in the context of the experimental question and of previous research in the area. Another option is to create a segment of the design (e.g., AB), with the remaining components of the design to be determined once the baseline and/or the first intervention phase is implemented. Depending on the pattern of the data that is observed, the researcher may either proceed with a strategy to test the interventions further (e.g., ABAB) or revise the intervention (e.g., ABC . . .). In either case, repeated assessment across the series allows the researcher to be responsive to data as they appear in the series.

### *Replication*

In order to address various threats to internal validity, the single-subject researcher must use some method of replication in the experiment to maximize its inference for a treatment effect. Internal validity is primarily, but not exclusively, addressed through the type of design structure that is imposed on the study. In single-case designs, three basic design options are available: within-series, between-series, and combined-series. Each of these design types is discussed in more detail below, along with examples of its application in psychotherapy research. In each design component, the researcher depends on replication of the intervention to establish a causal relation and to eliminate various threats to internal validity. However, the degree to which internal validity threats are addressed extends beyond the replication procedures used.

### *Single-Case Research Design Types*

A number of single-case research designs have been used in applied and clinical settings with a wide variety of childhood disorders. It is beyond the scope of this chapter to review the intricacies of all designs and their applications. The interested reader is referred to some major books on methodology for

this review (e.g., Barlow & Hersen, 1984; Kazdin, 1982; Kratochwill, 1978). As noted above, most single-case research designs can be conceptualized in terms of three basic components or options: within-series, between-series, and combined-series elements (see Barlow, Hayes, & Nelson, 1984, for a detailed overview of these design options). In the within-series design, elements that the investigator evaluates change in client measures *within* various phases of the investigation. The traditional ABAB design represents the most common procedure in the within-series domain. Within-series designs can be examined with simple phase changes, as would be the case with the ABAB design, or in more complex changes, wherein the researcher manipulates two or more variables separately or in combination. For example, an A/B+C/A/B+C design involves examining two component treatment conditions but still maintains the within-series comparisons.

The between-series designs allow the investigator to compare two or more interventions across time. Typically, the comparisons are made between different interventions on the dependent variables, with the various shifts in the data series taken into account as the intervention is applied over time. The most common design types in the between-series strategy include the alternating treatment design and the simultaneous treatment design.

In the combined-series single-case designs, the researcher combines the elements of both the within- and between-series features. The multiple-baseline design across individuals (subjects), behaviors, or settings represents the most common application of the combined-series-elements design.

## *Single-Case Design Applications in Childhood Psychopathology*

### *Example 1*

Single-case research designs have been used in a number of investigations of childhood anxiety disorders (Morris & Kratochwill, 1983). For example, Van Hasselt, Hersen, Bellack, Rosenblum, and Lamparski (1979) assessed an 11-year-old multiphobic child using motoric (i.e., ladder climb and blood), cognitive (Target Complaint Scale, BAT, and test-taking task), and physiological measures to examine the effects of a relaxation and desensitization treatment. The authors used a combined-series, single-case design to examine the effects of the treatment program on the three measures. The outcome of the study is reported in Figure 1. On the physiological measures, the investigators measured the child's pulse rate 5 minutes after arrival for a probe and again immediately before the child ascended a ladder. The authors calculated a change score by subtracting the second reading from the first. Heart rate and finger pulse volume were monitored throughout the BAT and the test-taking task. The authors found that there was a decrease in heart rate in the ladder climb task during the relaxation treatment, followed by a further decrease with the implementation of the desensitization treatment. Nevertheless, no change occurred on finger pulse volume or heart rate measures for the BAT and the test-taking task.

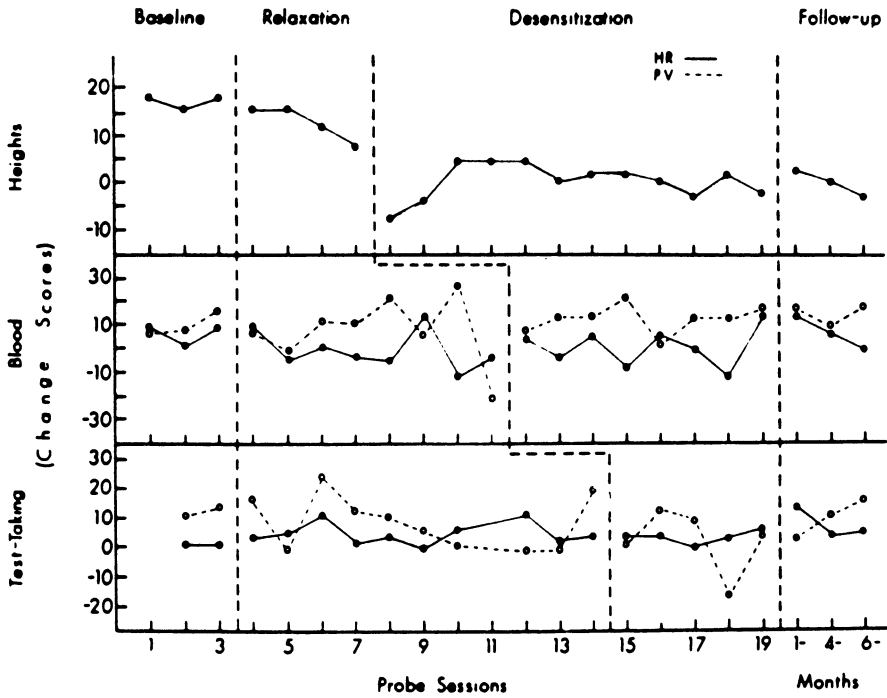


FIGURE 1. Physiological responses (HR = heart rate; PV = pulse volume) in probe sessions during baseline, relaxation training, systematic desensitization, and follow-up. A multiple-baseline analysis of treatment for phobias of heights, blood, and test taking. (Source: V. B. Van Hasselt, M. Hersen, A. Bellack, N. D. Rosenblum, & D. Lamparski. [1979]. Tripartite Assessment of the Effects of Systematic Desensitization in a Multi-Phobic Child: An Experimental Analysis. *Journal of Behavior Therapy and Experimental Psychiatry*, 10, 51-55. Reproduced by permission.)

Example 2

Another example of the use of single-subject research in the treatment of childhood psychopathology is evident in the study by Wells, Conners, Imber, and Delamater (1981) of an attention-deficit-disordered child (with hyperactivity). The study is interesting because it illustrates the use of single-subject methodology in making a decision about which treatment or combination of treatments is most appropriate for a given individual. The authors used an A/B/A/C/C+D/A+D/C+D design to examine the relative effectiveness of dextroamphetamine (Dexedrine) (B), methylphenidate (Ritalin) (C), behavioral self-control (D), and their combinations to evaluate the treatment of the child. Assessment occurred across behavioral (see Figure 2) and physiological (see Figure 3) systems. Although the authors concluded that the combination of methylphenidate and behavioral self-control procedures was the most effective, it should be noted that a replication of the first C phase (i.e., ACA) should have been scheduled. Also, the conclusion must be interpreted within the context of the order of administering treatments; that is, the C+D condition was preceded by the B and C treatments.

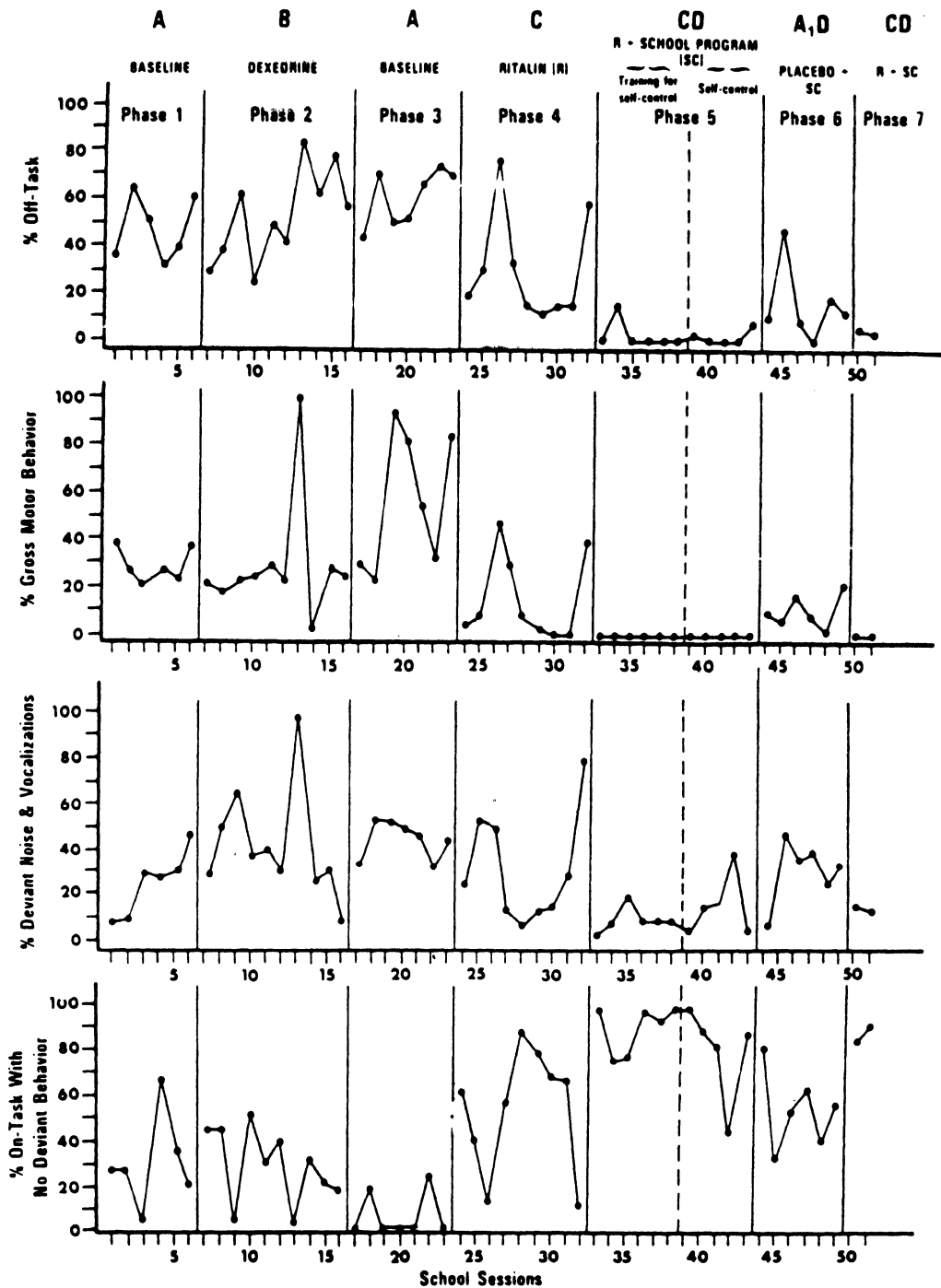


FIGURE 2. Percentage occurrence in the classroom of off-task behavior, gross motor behavior, deviant noise and vocalizations, and on-task behavior with no other deviant behavior recorded, measured across baseline, and placebo phases. (Source: K. C. Wells, C. K. Conners, L. Imber, & A. Delamater. [1981]. Use of Single-Subject Methodology in Clinical Decision-Making with a Hyperactive Child on the Psychiatric Inpatient Unit. *Behavioral Assessment*, 3, 359-369. Reproduced by permission.)

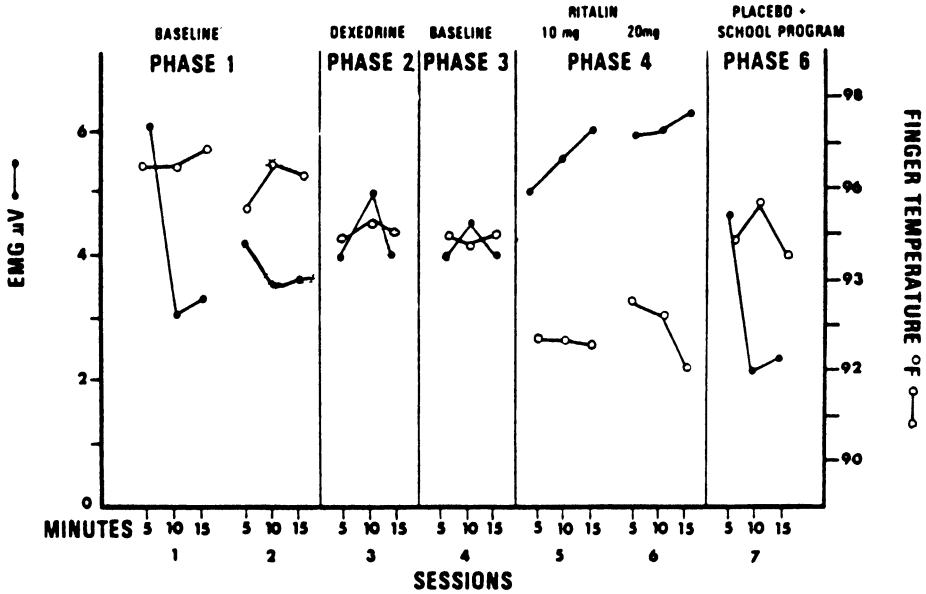


FIGURE 3. Levels of electromyographic activity (solid circles) and of finger temperature (open circles) measured in 15-minute sessions across baseline, medication, and placebo phases. (Source: K. C. Wells, C. K. Connors, L. Imber, & A. Delamater. [1981]. Use of Single-Subject Methodology in Clinical Decision-Making with a Hyperactive Child on the Psychiatric Inpatient Unit. *Behavioral Assessment*, 3, 359-369. Reproduced by permission.)

### FUTURE DIRECTIONS FOR BEHAVIORAL ASSESSMENT IN CHILD PSYCHOPATHOLOGY

Ollendick and Hersen (1984) described child behavioral assessment as an “exploratory, hypothesis-testing process in which a range of specific procedures are used . . . to understand a given child . . . and to formulate and evaluate specific intervention strategies” (p. 6). Although the focus of this chapter has been on direct assessment techniques, more recent advances have broadened the scope of child behavioral assessment to encompass not only discrete target behaviors and their environmental determinants, but also covert behaviors such as affective responses, cognitions, and physiological reactions. This broadening of scope has resulted in the use of a wide range of assessment strategies, many of which have been described in this and other chapters on methods of assessment, including interviews, questionnaires, standardized instruments, checklists, and physiological methods, as well as direct observation. Although the importance of the systematic observation of child behaviors should not be minimized, the increased focus on a multimethod approach in behavioral assessment represents a strength as well as a potential problem in behavioral assessment that warrants further research and development.

The comprehensive nature of a multimethod approach is perhaps its most salient characteristic. Typically, any single procedure, including the direct obser-

vation methods discussed here, will not provide the most complete diagnostic perspective of the child. An integrated, functional analysis of the child's behavior problems is made possible through the use of multiple assessment procedures. As noted by Mash and Terdal (1981), however, a potential problem with a multimethod approach that incorporates diverse assessment methods is that different methods may yield discrepant or at least varied information. Thus, as with a traditional test-battery approach, data from multiple sources do not necessarily lead to a clearer understanding of the child or to the development of more effective interventions.

One way to circumvent this potential problem and to maximize the efficiency of a multimethod approach is to validate the assessment strategies being used, independently and in combination. Thus, the development of empirically validated procedures represents an additional area for further research efforts. Although several factors guide the selection of assessment techniques (e.g., referral problem, child characteristics, and assessment setting and purpose), psychometric qualities, including reliability, validity, clinical utility, and sensitivity—and, where appropriate, standardization—should be primary considerations in choosing assessment procedures. These psychometric dimensions are particularly important for behavioral assessment in child psychopathology because of its impact on classification and on the development and evaluation of treatment. Conclusions derived from the use of inadequately developed or evaluated instruments must be viewed cautiously because of the potentially invalid information obtained.

A number of authors (e.g., Coates & Thoresen, 1978; Cone & Hawkins, 1977) contend that it is difficult to apply conventional psychometric concepts and standards to child behavioral assessment that is based on incompatible theoretical assumptions such as situational specificity and temporal inconsistency of behavior. Nonetheless, some degree of consistency can be expected among procedures assessing similar behaviors across similar situations. Therefore, certain psychometric procedures do seem relevant to behavioral assessment techniques. Perhaps the most important dimension for evaluating methods of assessment is validity. Criterion-referenced validity is the extent to which information from one assessment method (e.g., direct observation of on-task behavior in a teaching situation) correlates with information from another assessment method for the same behavior (e.g., self-monitoring or teacher reports of on-task behavior). Internal validity is related to the accuracy of assessment information (typically evaluated through interobserver agreement), whereas external validity is the generalizability of assessment information beyond the specific assessment setting or situation. Behavioral assessment methods should also be expected to predict subsequent behaviors with some degree of accuracy (predictive validity). Additional dimensions on which assessment methods can be evaluated include their sensitivity (the degree to which they reflect changes in the behavior), their utility (the extent to which the methods are applicable to a variety of children, problem behaviors, and assessment situations), and their acceptability (to the child or to significant adults).

Just as greater attention should be focused on the psychometric qualities of behavioral assessment procedures, attention to developmental factors in chil-

dren and the sensitivity of assessment methods to these factors are also important. Given that developmental change is distinctively characteristic of children, normative comparisons should be made as often as possible in assessment to ensure the appropriate diagnosis and selection of target behaviors and to ascertain that behavior change is linked to treatment, rather than to normal developmental change. Furthermore, the age and the level of cognitive or social development of the child can clearly influence the appropriateness of specific assessment procedures. For example, reactivity to naturalistic observation or self-observation may be age-related. Ability to respond to analogue settings may also be tied to age-related verbal or cognitive variables. Thus, there are several potential age-related constraints on the use of behavioral assessment strategies with children exhibiting behavior disorders. These and the other areas discussed are in need of further exploration to facilitate the application of behavioral assessment strategies in child psychopathology.

## SUMMARY

Behavioral assessment in general has expanded rapidly since the mid-1970s, with the most recent advances occurring specifically in the development and application of assessment strategies for children exhibiting behavior disorders. The underlying assumption of a behavioral approach (i.e., that children's behavior is a function of situational factors rather than a reflection of personality traits) has led to the development of various behavioral diagnostic and classification systems for use with children; these were discussed in an initial section of this chapter, where it was noted that such systems are not used widely. Although the methods of behavioral assessment with children are diverse and include both direct and indirect measures, the focus of the subsequent section was on direct assessment techniques, including observation, analogue assessment, participant monitoring, and self-monitoring. Behavioral assessment in child psychopathology is clearly a developing methodology. Therefore, the final sections also addressed a number of recent developments within it, including research and evaluation designs, the increased application of psychometric concepts to assessment methods, the broadening scope of behavioral assessment, and the growing emphasis on a multimethod approach. Although areas for further research and development remain, behavioral methodology remains a viable approach for both assessment and treatment evaluation in child psychopathology.

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# 8 *Interviewing and Report Writing*

BARRY A. EDELSTEIN AND ELLEN S. BERLER

## INTRODUCTION

The interview is probably the most widely used assessment procedure, regardless of one's theoretical orientation (Haynes, 1978; Linehan, 1977; Morganstern, 1976; Swan & MacDonald, 1978), and it is typically the first contact one has with clients and the significant individuals in their environment (Atkeson & Forehand, 1981). The content and standardization of questions, the general style of inquiry, and the way in which one interprets the obtained information frequently vary with the theoretical orientation of the interviewer. Regardless of the orientation of the interviewer, the interview influences the client's behavior and the consequent analysis and intervention that is based on the information obtained by the interviewer (Haynes, 1978). In short, the interview is the first critical link in the therapeutic process.

Unfortunately, systematic evaluations of the clinical interview are limited, and the result is interview practices of questionable reliability (cf. Hay, Hay, Angle, & Nelson, 1979) and validity. The effectiveness of the various methods used is, for the most part, unknown (Edelstein, Brasted, Detrich, DiLorenzo, Knight, Rapp, Scott, & Sims, 1982; Haynes, 1978; Weins, 1976). We have little empirical basis for our interviewing practices even though the clinical interview is the most frequently used assessment procedure. With that caveat stated, we will proceed with our discussion of the initial interview and the resulting report, including a review of some of the available literature on the validity and reliability of several structured interviews that have been recently developed for diagnostic purposes.

## INTERVIEW PROCESS

Each client comes to the interview situation with a unique history of interactions with health and mental health professionals, as well as with a history of

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being questioned about her or his behavior by teachers, physicians, and parents. Each has her or his own expectations of what will transpire in the interview and what the outcome will be. No client is certain of what the interviewer would like to know, and no interviewer is completely knowledgeable about the client's history. The initial interview involves a subtle shaping of each individual's behavior through a learning process. The interview is typically a dyadic interaction that is subject to many of the same rules and contingencies that guide interactants in general social interactions. For instance, the same principles of conditioning apply in which the verbal behavior of the client and the interviewer is reinforced by the behavior of each interactant (cf. Ferster, 1972, 1979, 1981; Krasner, 1958; Skinner, 1957; Truax, 1966; Williams, 1981). The interview may also be approached from an information-processing perspective by characterizing the interview process as a cybernetic model (e.g., Miller, Galanter, & Pribram, 1960; Wiener, 1948). The interviewer and the interviewee may be viewed as testing or examining the interpersonal environment (the behavior of the other individual), as operating on this environment (through verbal and nonverbal behaviors), as again testing to determine the effects of the previous behavior, and then as exiting to another aspect of the interaction if the desirable or expected results are obtained. The interviewer is a problem solver whose task is to obtain the information necessary for analyzing the data presented by the client.

The early portion of the interview typically involves the development of trust and rapport. Each interactant examines the behavior of the other through questions, answers, and nonverbal responses. The interviewer attempts to educate the client with respect to what the interviewer needs to know, what form the information should be presented in, and how this information will be used. As trust is established, the child and the parent learn that they can report potentially unacceptable behaviors without being judged and verbally punished. Over the course of the interview(s), various interviewer and interviewee behaviors may come to follow predictable sequences (e.g., Edelstein *et al.*, 1982). Careful attention to one's own behavior in relation to that of the client permits one to adjust one's behavior for maximal effectiveness. This vigilance, for example, may reveal early instances of client resistance or countercontrol. The important point to remember is that the interview is an active learning process in which both interactants are influenced through selective reinforcement and punishment of verbal behavior.

## FUNCTIONS OF THE INTERVIEW

The interview may serve several functions, depending on the goals of the interviewer. Ollendick and Cerny (1981) identified four major objectives of the initial child and family interview:

- (1) to clarify presenting complaints;
- (2) to obtain a developmental and social history;
- (3) to assess family interaction patterns that might be related to the target behaviors; and
- (4) to determine resources within the family that might be utilized in treatment programming. (p. 31)

The initial interview is also used frequently for screening and diagnosis (Haynes & Jensen, 1979), for obtaining the information necessary for target behavior identification (Ciminero, 1977; Haynes, 1978), and for the performance of a functional analysis of these target behaviors or presenting problems (Ciminero, 1977).

The functions identified by Ollendick and Cerny (1981) and by Ciminero (1977) are more likely to be approached in a less structured and standardized fashion, whereas the trend in screening and diagnosis is toward more structured, standardized interviews. Interviews designed for these different purposes are reviewed below.

## SCREENING AND DIAGNOSTIC STRUCTURED INTERVIEWS

The recent trend toward more structured interviews for screening and diagnostic purposes is largely due to the need for greater diagnostic reliability than is found in unstructured interviews and to the development of more explicit diagnostic criteria for childhood disorders. The latter requires the collection of detailed information that may not be consistently available from unstructured interviews (Edelbrock & Costello, 1984).

Structured interviews can vary in several dimensions, one of which is the degree of structure. Semistructured interviews provide general guidelines and permit interviewers to use some clinical judgment in the conduct of the interview and in the recording and coding of responses. Highly structured interviews contain specific rules about the rating of responses and specify the wording and sequencing of questions. The greater flexibility of semistructured interviews allows more spontaneous and conversational interviews. Advocates of less structured interviews argue that interviewers must be willing to adjust their language to variations in the client's behavior and the situation so that responses occur in a more natural context (Yarrow, 1960). Highly structured interviews offer greater objectivity and result in more quantifiable data, though they may appear more stilted. It is not yet known whether the degree of structure affects the validity or reliability of interviews (Edelbrock & Costello, 1984).

An interview may contain several parts that vary in degree of structure. For example, the Kiddie SADS (Puig-Antich & Chambers, 1978) begins with a semistructured interview, during which rapport is established and information is obtained about the presenting problem and its history. The second part of the interview is a more structured examination of the child's symptoms. The Kiddie SADS also includes a "skip" structure, in which questions in a section can be skipped if responses to an initial screening question indicate that a particular symptom is not present. This approach can help shorten the length of the interview considerably.

Structured interviews vary on many dimensions other than degree of structure. Each of these variables should be considered by clinicians and researchers when they select a particular instrument, taking into account the purpose of the

TABLE 1. Characteristics of Diagnostic Structured Interviews

	Kiddie SADS	DICA <sup>a</sup>	CAS <sup>b</sup>	DISC <sup>c</sup>
No. of items	About 100	About 200	About 135	Child: 264 Parent: 302
Time period assessed	Ongoing episode and past week	Lifetime	Mostly current	Lifetime
Age assessed (years)	6-17	9-17	7-12	6-18
Completion time	1½ hours	1½ hours	45-60 min.	1 hour
Degree of structure				
Structured	Part II	X	—	X
Semistructured	Part I	—	X	—
Informant				
Child	X	X	X	X
Parent	X	X	—	X
Clinical expertise needed	Yes	Yes	Yes	No
Diagnostic criteria	RDC, <sup>d</sup> DSM-III	DSM-III and other	DSM-III	DSM-III

<sup>a</sup>Diagnostic Interview for Children and Adolescents (Herjanic *et al.*, 1975).

<sup>b</sup>The Child Assessment Schedule (Hodges, Kline *et al.*, 1982).

<sup>c</sup>The Diagnostic Interview Schedule for Children (Edelbrock *et al.*, 1985).

<sup>d</sup>Research Diagnostic Criteria (Feighner *et al.*, 1972).

interview, the population being assessed, and the available time and resources. These dimensions include the content areas and symptoms, the breadth of diagnostic categories (some focus on one area of pathology, such as depression, whereas others include a wide range of diagnostic categories), the age range covered by the interview, the degree of expertise and training needed by interviewers to administer and score the interview, whether or not a particular classification system (e.g., DSM-III; American Psychiatric Association, 1980) is used in the derivation of the interview, the duration of the interview, the time frame of the interview (e.g., symptoms occurring during the past month), and whether both parent and child versions of the interview are available. Table 1 provides information on some of these variables for several diagnostic interviews that are reviewed below.

One of the major determinants in the selection of an interview should be its psychometric properties. Most of the more recently published structured interviews are still in the process of being developed and evaluated, so that the reliability and validity of these instruments have not yet been fully established. Nevertheless, many of them appear promising, and a brief overview of the current status of several general diagnostic interviews is given below. Interviews designed for diagnosing a specific problem area (e.g., depression or hyperactivity) are not included. Furthermore, an in-depth analysis of each of the reviewed instruments is not possible in the present chapter. For more detailed coverage, the reader is referred to an excellent review of screening and diagnostic structured interviews by Edelbrock and Costello (1984) and to a discussion of current issues in the area by Herjanic (1984).



## *The Kiddie SADS*

The Kiddie SADS (Puig-Antich & Chambers, 1978) is based on the Schedule for Affective Disorders and Schizophrenia, a structured interview for adults (Endicott & Spitzer, 1978). It uses the Research Diagnostic Criteria (RDC; Feighner, Robins, Guze, Woodruff, Winoker, & Munoz, 1972) and DSM-III diagnostic criteria for diagnoses such as major depression (including subtypes), mania, schizophrenia, conduct disorder, separation anxiety, phobias, obsessive-compulsive disorder, and generalized anxiety disorder.

Reliability and validity data on the Kiddie SADS are limited. It has content validity because of its use of the diagnostic criteria (Edelbrock & Costello, 1984). Other evidence of its validity is based primarily on studies with small numbers of prepubertal children identified by the Kiddie SADS as having a major depressive disorder. These studies have provided preliminary evidence suggesting that children identified as fitting RDC criteria for a major depressive disorder are often clinical responders to imipramine treatment (Puig-Antich, Blau, Marx, Greenhill, & Chambers, 1978; Puig-Antich, Perel, Lupatkin, Chambers, Shea, Tabrizi, & Stiller, 1979) and show cortisol hypersecretion, which is believed to be an indicator of depression in adults (Puig-Antich, Chambers, Halpern, Hanlon, & Sachar, 1979). Again, these data should be viewed tentatively in light of the small sample sizes, the lack of controls, and the questionable value of cortisol hypersecretion as a valid indicator of depression (Edelbrock & Costello, 1984).

Ratings of the Kiddie SADS reflect each symptom at its worst during the ongoing episode; ratings are also usually obtained for the week before the assessment. An epidemiological version has recently been developed (Kiddie-SADS-E) for children and adolescents aged 6–17, which assesses both past and current episodes of psychopathology in the same population (Orvaschel, Puig-Antich, Chambers, Tabrizi, & Johnson, 1982). The focus is on the presence or absence of symptomatology rather than on severity; the instrument is therefore not intended to be used to evaluate treatment effectiveness. Symptoms relevant to DSM-III criteria are included for a wider range of diagnostic categories (e.g., autism, anorexia nervosa, attention deficit disorder, and alcohol and drug abuse) than is found in the original Kiddie SADS. Validity was assessed by Orvaschel *et al.* (1982) by comparing Kiddie-SADS-E diagnoses with diagnoses made on the Kiddie SADS 6 months to 2 years earlier for 17 children who had participated in a previous study. All but one subject received a comparable diagnosis on both interviews. Moderate mother–child agreement was obtained for both interviews, with most kappa coefficients above .60. However, poor mother–child agreement was obtained on some items, leading the authors to suggest that both mothers and children need to be interviewed.

## *Diagnostic Interview for Children and Adolescents (DICA)*

The DICA (Herjanic, Herjanic, Brown, & Wheatt, 1975) is a highly structured diagnostic interview for children and adolescents that can be administered

to parents and children. The interview is primarily designed to allow yes or no answers to a broad range of questions that cover relationships and behavior at home and at school, learning problems, and psychiatric symptoms (e.g., phobias, anxieties, depression, somatic complaints, ideas of reference and hallucinations and delusions).

The validity of the DICA has been supported in a study by Herjanic and Campbell (1977), in which children being evaluated at an outpatient psychiatric clinic significantly differed from children attending a pediatric outpatient clinic on the basis of the number of symptoms recorded from DICA interviews with parents and children. The number of symptoms required to distinguish between the groups varied according to the age of the child and the area of questioning.

Mother-child agreement on the DICA has been examined in several studies. Average agreement on individual items was found to be 80% (Herjanic *et al.*, 1975), but that figure may be inflated because of the low prevalence of many symptoms (Edelbrock & Costello, 1984). Using the kappa coefficient to correct for chance levels of agreement, and evaluating only items pertaining to psychiatric symptoms, Herjanic and Reich (1982) found that 73% of the kappas were below .30. The authors noted that items with high kappas referred to observable, concrete, severe, and unambiguous behaviors that would be brought to the mother's attention. Items with low kappas tended to require a greater degree of judgment and could be easily misunderstood or misinterpreted. Reich, Herjanic, Welner, and Gandhi (1982) compared diagnoses resulting from interviews with mothers and children and found a fairly high level of disagreement, with most kappas below .40.

Limited evaluations of agreement between independent raters have yielded average percentages in the mid-80s (Herjanic *et al.*, 1975; Herjanic & Reich, 1982) and average stability coefficients across 2- to 3-month intervals of .89.

### *The Child Assessment Schedule (CAS)*

The CAS was developed for diagnostic purposes and to aid in treatment planning (Hodges, Kline, Stern, Cytryn, & McKnew, 1982; Hodges, McKnew, Cytryn, Stern, & Kline, 1982). Clinical judgment is used in the administration and scoring of the interview. The first part is a semistructured interview that was designed to enhance rapport with the child by grouping items in a way that leads the child to experience the interview as an informal discussion. The questions cover such topics as school, friends, family, fears, mood, somatic concerns, and thought disorder symptomatology. The examiner's observations of the child's insight, motor coordination, activity level, cognitive ability, quality of emotional expression, and interpersonal interactions, among other areas, are recorded in the second part of the CAS. The instrument yields a total score, scores for content areas, and scores for symptom complexes that are analogous to DSM-III diagnoses.

Interrater reliability coefficients for a sample of 53 inpatient, outpatient, and normal control children averaged .90 for the total score; progressively lower average coefficients were found for content areas, symptom complexes, and

individual items. The CAS was revised on the basis of these results, and reliability coefficients for content areas and symptom complexes were found to be higher (all  $r$ 's  $\geq .86$ ) for a sample of children of affectively disturbed and normal mothers. Additional evaluations of interrater reliability are needed with larger samples.

The CAS has significantly discriminated between inpatient, outpatient, and normal control groups. Discriminant analyses compared favorably with the Child Behavior Checklist (both measures were moderately correlated), although the best discriminant function occurred when the CAS and the Child Behavior Checklist (Achenbach, 1978) were both used. The latter finding suggests an approach to diagnosis in which interviews are supplemented by information collected by other means, such as behavior checklists (Hodges *et al.*, 1982). The CAS was also shown to be moderately correlated with the State-Trait Anxiety Inventory for Children (Speilberger, 1973) and a self-report measure of depression (Child Depression Inventory; Kovacs, 1978), indicating adequate concurrent validity.

### *The Diagnostic Interview Schedule for Children (DISC)*

The newest of the diagnostic interviews is a highly structured instrument that includes a parent and child version and covers symptoms relevant to a very broad range of DSM-III diagnoses (cf. Edelbrock & Costello, 1984). A unique feature of the DISC is the authors' sensitivity to developmental differences in children within the target age range (6–18 years old). The interview incorporates certain features (e.g., short questions) that increase the likelihood that the questions will be suitable for and understandable by both younger and older children. In addition, the instrument was designed to be administered and scored by trained lay interviewers. It is therefore highly structured and well suited to its major purpose as a large-scale epidemiological research instrument. Other interviews generally rely on administration and scoring by highly trained clinicians. An exception is the CAS, which requires training but not necessarily clinical expertise for scoring purposes.

Psychometric evaluations of the DISC are being conducted and are beginning to appear in the literature (Edelbrock, Costello, Dulcan, Kalas, & Conover, 1985). Reliability for symptom scores across a median interval of 9 days averaged .62 for the child interviews, with somewhat higher reliability for behavior and conduct symptoms than for affective and neurotic symptoms. In general, reliability was higher for children aged 14–18 than for those aged 10–13, which in turn, was higher than the reliability for 6- to 9-year-old children.

Parent interviews yielded average test-retest reliability coefficients of .75 for symptom scores. Paralleling the findings with the child interviews, scales tapping behavior and conduct problems were somewhat more reliable than affective and neurotic symptom scales. Reliabilities tended to be slightly higher for parents of younger children, a finding that contrasted with the findings on the child interviews. A comparison of the reliabilities of parent and child interviews showed that parent reports of child symptoms were more reliable than

children's reports for the 6- to 9-year-olds and less reliable for the 10- to 13-year-olds. No significant differences were found for the oldest group.

### *Summary*

The research on structured diagnostic interviews is promising, but the reliability and validity of these instruments are not yet well established. Consistent with the existing literature on classification systems, the reliability of the structured interviews is best for global indices of functioning and is weak for specific behaviors, particularly for covert behaviors such as fears and anxieties. Test-retest reliability and interrater agreement have not been assessed for many of the recently developed instruments. Where reliability information is available, the data are often based on small subject samples, on few raters, or on videotaped interviews. Most validation is based on discriminant or face validity; concurrent validity is rarely assessed (Edelbrock & Costello, 1984).

Several tentative conclusions can be drawn from the research on diagnostic interviews, though confirmation through additional empirical work is needed. Interviews should be conducted with both parents and children when possible, in light of the low to moderate agreement between informants. Agreement is likely to be highest for overt, unambiguous behaviors and lowest for more subjective and covert symptoms. Thus, the child's perspective is needed for a more complete understanding of the child's behavioral and emotional functioning. Limited evidence (Edelbrock *et al.*, 1985) suggests that children under 10 may not provide reliable information, though an interview with these children can serve other purposes, such as establishing rapport and allowing the interviewer to observe the child's interpersonal behaviors. A more comprehensive assessment of the child may also result from a multimethod approach in which checklists, direct observation, and other sources of information are used.

## BEHAVIORAL INTERVIEWS FOR THE DEVELOPMENT OF TREATMENT PLANS

Initial interviews are frequently used to obtain information that can aid in the development of treatment programs. Though typically not used as the sole assessment method, behavioral interviews are designed to identify target behaviors and the functional relationships underlying the development and maintenance of presenting problems so that effective treatment strategies can be implemented (Ciminero, 1977). Behavioral interviews are typically unstructured and are guided by the goals of behavioral assessment, for example, to operationalize deviant and desirable behaviors and to determine the frequency, intensity, and duration of the target behaviors, the environmental variables that set the occasion for the behaviors, the consequences of the behaviors, and potential positive reinforcers and punishers. Numerous papers have been published that incorporate these elements into their descriptions of the process and content of behavioral interviewing and assessment (e.g., Ciminero & Drabman, 1977; Evans &

Nelson, 1977; Gross, 1984; Holland, 1970; Kanfer & Saslow, 1969; Linehan, 1977; Meyer, Liddell, & Lyons, 1977; Morganstern & Tevlin, 1981; Wahler & Cormier, 1970). All share these commonalities, regardless of whether they focus on children. However, assessment guidelines often differ in terms of the amount and breadth of information viewed as being necessary for a complete functional analysis. These areas include the exploration of past history relevant to the target behaviors and to other topics (e.g., developmental history, family history, and interpersonal relationships), cognitions, imagery, affect, and physiological variables, as well as differences in the degree to which information about desirable behaviors and client assets is collected.

The unstructured behavioral interview permits a large degree of flexibility in the wording, content, and sequencing of questions. This approach is consistent with an idiographic approach and with Stuart's emphasis on parsimony (1970) as a guiding factor in behavioral assessment. However, a potential disadvantage of such an unstructured approach is a reduction in the reliability and validity of the behavioral interview. Unfortunately, minimal research in this area has been conducted. Studies evaluating interassessor agreement on problem areas (Hay *et al.*, 1979), hypothesized controlling variables, and treatment plans (Felton & Nelson, 1984) based on interviews with adults have reported average reliability coefficients of less than .55. Agreement did not improve when questionnaires and role playing were used in addition to the interview (Felton & Nelson, 1984). In the study by Felton and Nelson, the interviewers were inconsistent in the questions they asked, and this inconsistency may have contributed to the low level of agreement. Whether increasing the degree of structure and therefore the consistency of questions used in behavioral interviews improves reliability awaits empirical testing. Imposing structure on behavioral interviews may prove difficult, particularly if assessment is to remain idiographic. Additional research in this area is clearly needed. A relevant question to be addressed concerns the importance of obtaining agreement on target behaviors, controlling variables, and treatment plans. The necessity of applying psychometric evaluations to behavioral interviews will be supported only if a positive relationship is found between adequate levels of reliability and treatment effectiveness (Felton & Nelson, 1984).

## DEVELOPMENTAL CONSIDERATIONS

Children are not merely small adults. Many a vacant hour has been spent by interviewers attempting to question children as they would an adult. Familiarity with the unique characteristics of children at various developmental stages or ages is important if an effective interview is to occur. Developmental factors may come into play when one is considering how and when to interview and what questions are to be asked, including whether a question is more effective than a less directive approach to the interview (e.g., puppet play). Limited space precludes a thorough discussion of the many developmental issues that should probably be considered when interviewing children. We will address a few of

the more important considerations. The reader is referred to an excellent paper by Bierman and Schwartz (1986) for a more extensive treatment of cognitive developmental variables that are likely to influence the interview process and outcome.

The cognitive and language skills of young children are limited in ways that may influence their response to questions about significant others. For example, children under the age of 6 are more likely to use concrete, simple terms in describing aspects of their personal and "impersonal" environment. They tend to describe other individuals in terms of their physical characteristics and overt behavior and to base their inferences on situational cues (Bierman, 1983; Livesley & Bromley, 1973; Watt, 1944). They also tend to use few constructs in describing their environment and to offer brief descriptions that include few pieces of related material (Bierman, 1983; Haynes, 1978; Livesley & Bromley, 1973). Preschool children also typically use few abstractions and categorize their world into "goods" and "bads." They have difficulty dealing with more than one concrete concept or dimension of their environment at a time. Thus, one cannot necessarily expect preschoolers to be able to integrate and relate characteristics of their environment. Young children are also unable to take the perspective of other individuals "because they cannot mentally compare what they are thinking with information about other persons and deduce how other's thinking may differ from their own" (Bierman, 1983, p. 220).

Beyond the age of about 7, children begin to entertain multiple pieces of information, feelings, characteristics of others and to integrate them into more abstract conceptualizations. They can begin to take alternative perspectives on their own behavior as well as on that of others.

In light of the rather concrete, unidimensional cognitive abilities of young children, one can often be most effective by asking simple, concrete questions with concrete examples. Even the answer requested can be simplified (Bierman, 1983). For very young children, one might use concrete objects (e.g., toys and pictures) as foundations for questions that relate to these objects. Bierman (1983) suggested that children can be asked to draw pictures of themselves. They can then be asked questions about what they do and do not like to do, what they like and dislike about their families, and so on. Another approach is to have them draw "happy," "sad," and "mad" faces and point to them when attempting to describe their feelings and behaviors as well as those of others. Much the same thing can be accomplished with the use of dolls with different expressions and in different roles.

With all the limitations imposed by the abilities of young children, one might ask just how far down the developmental or age scale one can go in applying interviewing procedures. Yarrow (1960) argued that the interview can be used effectively with 4-year-olds. Even younger children can be interviewed if one is willing to adapt one's methods to limitations in cognitive and linguistic abilities such as those previously mentioned. As we have noted above, for example, even if a child is poorly skilled in verbal expression, drawings and play objects can be used by the interviewer as well as the child for formulating questions and replies. They can also be useful in developing rapport, even if the

information obtained is of questionable validity and reliability (Edelbrock *et al.*, 1985).

Developmental factors are important when one is determining what childhood behaviors are "typical" or "normal." Developmental considerations usually involve normative comparisons between the behavior of the child in question and some performance average or norm that is generally accepted by society or professionals. Even though some more behaviorally oriented interviewers may argue for a greater emphasis on intraindividual comparisons, the social validity (cf. Kazdin, 1977) is sometimes ignored when addressing the behavior of individual children in isolation.

Hartmann, Roper, and Bradford (1979) identified some possible advantages of making normative comparisons. Normative comparisons may enable one to identify unusually low or high rates of a behavior as causing a problem. Certain types of childhood problems that are particularly common in various age groups and/or those that are transient can also be identified by making normative comparisons. Fear of strangers may be considered relatively normal for very young children but may be considered a clinical problem in older children (Ollendick & Cerny, 1981). Normative information about situations, rather than the child's behavior, may be helpful in identifying those situational variables that place the child at risk for the development of problems in the future (Mash & Terdal, 1981). The nature and quality of classroom instruction and the manner in which the teacher interacts with and strengthens certain behaviors can affect the likelihood of future behavior problems. The same kinds of situational norms for the home environment (e.g., variables concerning child abuse, alcoholism, and social class) can be useful in evaluating a child's behavior disorder and in anticipating future problems. The identification of critical variables and the establishment of norms could help guide the content of our interviews with parents, children, and teachers.

Mash and Terdal (1981) argued that we must begin to develop norms for the contextual variables that set the occasion for children's behaviors; we must have social and physical norms. They might include normative rates of parental commands (Cunningham & Barkley, 1979), the amount of teacher approval and disapproval in the classroom (Van Houten, 1978; White, 1975), and the amount of time spent interacting with siblings (Leitenberg, Burchard, Burchard, Fuller, & Lysaght, 1977).

Additional contextual information that may be predictive of future problems includes information about the mother's pregnancy, the child's delivery and development, significant illnesses, accidents (including head trauma), hospitalizations, operations, medications, allergies, diet, family, and any other related family factors. Not only is this an opportunity to obtain possibly relevant information, but it is also an opportunity to dispell feelings of guilt or confusion, about or responsibility for problems of the child for which the parents have taken responsibility (Herskowitz & Rosman, 1982). For example, Herskowitz and Rosman reported the case of a woman who feared that she had caused the lesions on her child's skin by spilling coffee on herself during pregnancy.

Rapid and uneven developmental change is a major consideration when

interviewing and assessing children (Ciminero & Drabman, 1977; Evans & Nelson, 1977; Mash & Terdal, 1981). Unfortunately, very few data exist that describe age trends for child behavior that are based on reliable and valid observations of children at different ages. Mash and Terdal (1981) noted that the available data are typically based on parents' global reports regarding the frequency of problem behaviors at different ages:

Developmental deviation has been defined empirically in relation to a deviation from some observed behavior norm (Achenbach & Edelbrock, 1979) and/or theoretically in terms of a deviation from some expected behavioral patterns characteristic of particular stages of cognitive or psychosexual development (Santostefano, 1971). (p. 26)

In summary, developmental factors that can affect the interview process and outcome abound. The efficiency, and perhaps the validity, of one's interview rests on how well one is able to incorporate this information into the interview process.

## GENERAL INTERVIEWING STRATEGIES AND ISSUES: POTENTIAL PROBLEMS AND FACILITATING FACTORS

We will note some of the potential problems that one may encounter while interviewing children, parents, and teachers and will suggest approaches for dealing with them.

### *Interviewing Children*

The interview situation is frequently anxiety-arousing for a child. Some of this anxiety can be alleviated by explaining what the interview is, what its purpose is, how the interviewer will proceed, how the interviewer expects the client to behave, and what the client may expect from the interviewer. In brief, it is important to explain the roles of the interviewer and the client (cf. Goldstein, Heller, & Sechrest, 1966; Lennard & Bernstein, 1960; Rotter, 1954).

One may also want to consider displaying objects that are familiar to the young child in an effort to disinhibit the child in a novel interview situation. Parents can be encouraged to bring familiar play objects, as well as some of the child's creative products. Play materials may reduce the child's apprehension because of their pleasant associations (Yarrow, 1960). The play materials should be sufficiently challenging to maintain the child's attention but not so interesting that the interviewer must pry the child loose from the play material. Yarrow (1960) suggested that the materials be inherently time-limited, so that the child can be engaged in the interview process after a brief interaction with the materials. The creative products (e.g., drawings and puzzles) can be admired by the interviewer, and the child's skills can be praised. The child can then be questioned about the products and other facets of his or her behavior as rapport is established.

The sex of the interviewer may pose a problem, depending on the age of the



child and the age and sex of the interviewer. Older male children may feel more inhibited in the presence of female interviewers, and older female children may feel more inhibited in the presence of male interviewers (Yarrow, 1960). However, no data are available to support or refute such observations.

The suggestibility of young children may pose a problem for the interviewer who has resorted to questions that suggest a response or that require only a yes or no response. The content and the tone of questioning can easily suggest a "correct" or "appropriate" answer to a question. Open-ended questions can be used frequently to avoid the simple yes and no responses. Yarrow (1960) advocated the use of a countersuggestion: several questions on the same topic are slanted in different directions to deal with the possible bias resulting from the content and/or tone of the questions.

Any unnecessary objects in the interview room may serve as distractors for the child. In general, the room should be quiet and free of any visual and auditory distractors.

The length of the interview must be considered in light of the child's age. Children may emit an easy response if they have become tired during a lengthy interview. Sometimes small breaks during a lengthy interview help to rejuvenate the child. These can turn into brief play sessions that can reinforce appropriate disclosing by the child during the interview.

Additional tips for interviewing children have been offered by Goodman (1972). He suggested that the interviewer speak slowly and in simple sentences, avoid repeated questioning by disguising questions, use the subjunctive as an invitation for the child to participate, speak quietly but audibly, not alter his or her grammar or vocabulary to approximate the child's, have questions proceed from the innocuous to the searching, and ask questions in such a manner that the answer is not implied.

In general, knowledge of child development enables one to circumvent many problems that could be encountered when interviewing children. The interviewer has a problem to solve when he or she is faced with a reluctant or distractible child. This problem may have to be the first one addressed before proceeding with the presenting problem. Resistance, for example, becomes the first problem to overcome before additional problem-solving and assessment can proceed. A reasonable knowledge of child development and good analytical skills usually enable one to conduct a profitable interview.

### *Interviewing Parents*

The parents are often the major source of information about the child's behavior. It is often the parents, rather than the child, who decide that the child has a problem and who initiate the evaluation and intervention process. Frequently, the "problem" either may be viewed differently by the child or may even not exist from his or her perspective, so that the parents are frequently distressed as much as, if not more than, the child. Thus, one really has several clients. Issues generally revolve around the child's behavior and distress, the parents' distress resulting from the child's behavior or the parents' own prob-

lems (e.g., marital conflict or depression), and the parents' unrealistic expectations of their child. The situation surrounding the ostensibly problem behavior of the child is frequently complex and very often involves multiple individuals in the family and school systems.

In addition to the distress expressed about the presenting problem(s), parents may also be distressed by the fact that their child is not perfect and may somehow feel cheated (Kaplan, 1971). They may have been frustrated by their previous encounters with health or mental health professionals and may be hostile to the interviewer because they have been unsuccessful in their attempts to deal with the child's behavior (Sattler, 1982). One should attempt to have both parents present when interviewing, so that both perspectives on the child's behavior may be obtained and so that both parents may share the responsibility for the child's care (Sattler, 1982). One can acknowledge that the parents have encountered problems and frustration and can attempt to engage the parents by asking them to speak freely as active participants in the interview assessment process and in future evaluations and/or interventions.

The establishment of rapport with the parents is an important aspect of the interview process. In many cases, the parents are called on for assistance once problem behaviors have been identified. Their cooperation is essential for the success of any intervention. The building of cooperation and rapport can begin during the first interview.

Allowing the child and the parents to interact during the initial interview permits one to observe their style of interaction. Even though the external validity of these interactions may be questionable, one can frequently form hypotheses that can be tested later via parental reports and direct observation at home and at school. It is important in ending the interview to be very cautious about one's optimism in determining the nature of the problem and the needed services. Many a parent has been frustrated by professionals' failing to deliver promised consequences or has been shocked by inaccurate diagnoses.

### *Interviewing Teachers*

The school is one of two major settings where problem behaviors are identified. Even when the school is not the setting for these behaviors, the teacher may be enlisted in the assessment of the child's behaviors by corroborating parental reports of a child's behavior. The teacher is also an excellent source of information regarding a child's potentially problem behavior (Ciminero & Drabman, 1977; Gross, 1984; Keefe, Kopel, & Gordon, 1978). Interpersonal skills, for example, may be ascertained by asking teachers about the child's peers, the nature and frequency of their interactions, the number of the child's friends, the inclusion of the child in group activities, and so on. Academic performance problems may be discovered by asking the teacher whether the child completes his or her assignments and whether they are completed on time. The child's performance can also be compared to that of other children in the class regarding remaining on-task, performance in various content areas, and the time needed to complete tasks. The child's behavior at school can often provide clues regard-

ing the controlling conditions for a child's behavior both in school and in other settings. Thus, the teacher is a valuable source of information and an essential ally if a program is to be implemented by him or her.

In meeting with the teacher for the interview, one can frequently relieve the teacher's anxiety about any responsibility for the child's problem behaviors without assigning responsibility to anyone. One can work with the teacher in defining problem areas and behaviors by pooling information obtained from parents, the teacher, and the child. One may also explore the resources of other school personnel, as well as the teacher, for possible later interventions. Finally, it is important that one not leave the teacher with the expectation that immediate results will be forthcoming (Handler, Gerston, & Handler, 1965).

## REPORT WRITING: CONSOLIDATING INTERVIEW INFORMATION

A report typically includes information that has resulted from the analysis and synthesis of multiple sources of information and, usually, multiple methods (e.g., interview, direct observation, psychological testing, and teacher reports). Because this chapter deals explicitly with the interview, we will address the report that results from the interview only. In many cases, this would be termed the *intake interview* or the *initial assessment*. For an excellent discussion of report writing using multiple sources of information, see Sattler (1982) and Tallent (1976).

### *Report Outline*

The outline of the report will undoubtedly vary according to the purposes of the interview and the agency or individuals who are to receive the report. One might consider the following generic outline, which can be expanded and elaborated as needed:

- Name:
- Date of birth:
- Chronological age:
- Date of examination or interview:
- Date of report:
- Grade:
- Reason for referral:
- General observations:
- Description of problems and analyses:
  1. Problem behavior(s)
  2. Historical antecedents of problem behavior(s)
  3. Current antecedents of problem behavior(s)
  4. Consequences of problem behavior(s)
  5. Functional analysis of problem behavior(s)
- Recommendations
- Summary

### *Reason for Referral*

This section contains a brief description of the presenting problem and the source of the referral (e.g., the name and affiliation of a physician). The reason for referral is usually the problem that will be addressed during intervention, unless other problems identified during the assessment subsequently supersede it.

### *General Observations*

The word *general* belies the importance of these observations, as well as the level of observational analysis that should occur in the interview. The interview offers the opportunity to observe significant samples of behavior of the child, interactions between the interviewer and the child, and interactions between the child, the parents, and possibly other family members. It is the next best thing the interviewer has to being with the child as he or she behaves over the course of the day in a variety of settings. Even though the interview situation differs from situations encountered by the child in a typical day, strong behavior patterns are frequently observed in such an atypical situation. Interactions between the child and significant others may take a form similar to that found in other settings. Interviewers have the opportunity to obtain considerable information and to formulate hypotheses about the child's behavior in other settings that can be tested by direct observations in these settings as well as by the verbal reports of parents and teachers.

Space does not permit us to address all the possible aspects of a child's behavior during an interview. Some of the major areas include the child's appearance, his or her cooperation with the interviewer, and general appraisal of his or her own abilities; his or her speech, vocabulary, ability to express himself or herself, general mood, interpersonal style, attention skills, and any other behavior that is relevant by virtue of the presenting problem(s); and atypical behavior patterns first noted in the interview situation.

### *Description of Problems and Analyses*

The selection of the problem or the target behavior influences the clinician's diagnosis, assessment, intervention implementation, and monitoring for evaluation (Kratochwill, 1985). Conceptual criteria for the selection of target behaviors may include the danger of the client to herself or himself or to others, the possibility that the behaviors will be maintained by significant others, the importance of the development of other behaviors that are hierarchically associated with the target behaviors, one's potential effectiveness in altering the contingencies of the environment to affect the target behavior, and the availability of systems that will promote the maintenance of the appropriate behaviors (Kratochwill, 1985).

From a behavioral perspective, the description of the problem includes information on the cognitive, motoric, and physiological domains. Depending

on the behaviorist's conceptual views, the emphasis on each of these domains may vary. The description may begin with a specific statement of the problem behavior; for example, the child is noncompliant in response to teacher and parental requests. Even though this would appear to be a simple description of behavior, it already has elements of a functional analysis. We have noted the class of behaviors of interest: the child engages in behavior that teachers and parents deem inappropriate to their requests. Notice that this problem behavior is stated positively; we have not noted that the child did not comply with requests because that is not a behavior. Stating problems in terms of what a child does not do can increase the difficulty of analyzing the problem and of developing an intervention program. The child is always behaving, and that behavior is being influenced by contingencies that one may have to influence.

Not only have we noted the class of behaviors of interest (those that follow requests), but we have also generally stated the conditions under which they occur. The inappropriate behaviors occur following requests and in the presence of teachers and parents.

The specification of problem behaviors and the targeting of behaviors for intervention are not simple tasks. We can rarely take the presenting problem as stated by the parent or teacher and begin an intervention. One could devote several chapters to just the selection of target behaviors; however, space does not permit us that luxury. An excellent treatment of the topic can be found in Hawkins (1985).

The remainder of the analysis is a more elaborate and complex specification of the many things that occur before and after the problem behavior that are apparently maintaining that behavior. Excellent discussions on the identification of the antecedents and consequences of a problem behavior and on the formulation of hypotheses through a functional analysis of possible maintaining variables can be found in many articles and textbooks on behavioral assessment and behavior modification (e.g., Gelfand & Hartmann, 1975; Kanfer & Saslow, 1969; Mash & Terdal, 1981).

The task of the interviewer is much like that of a detective who is faced with incomplete information and various clues. The initial interview occasionally provides the needed information; however, additional information from the child, the parents, and significant others, gleaned from interviews and direct observation, is frequently necessary.

### *Recommendations*

The recommendations should be supported by the description of problems and the analysis and synthesis of these data. The nature of the recommendations will depend on the function of the interview (e.g., screening, diagnosis, clarification of complaints, or targeting of behavior problems). Thus, recommendations may focus on the need for further examination and testing, the suggestion of particular forms of intervention, and predictions about future behavior. This section should be written so that the writer's confidence in his or her observations is very clear. Each recommendation should be accompanied by the

interview data that led to the recommendation. Because we are addressing the initial clinical interview, the recommendations will frequently be tentative. It should be clear to the reader what is a description of behavior and what is being inferred from the interview material. The recommendations should also take into consideration the reason for referral, noting any discrepancies between the presenting problem and what may have evolved as a superordinate problem as the interview progressed.

### *Summary*

The summary should be considered optional, particularly if it only repeats the recommendations. The report in its entirety should ideally be a summary (Sattler, 1982). One should keep in mind that some professionals, on receiving the report, read only the summary. That could be reason enough to avoid such a section.

As summarized by Sattler (1982), Applebaum (1970) noted seven important elements of report writing. These include the ability

(a) to balance between data and abstraction, (b) to use modulation, (c) to be assertive or modest when necessary, (d) to keep the interest of the reader, (e) to use illustrations wisely, (f) to discuss systematically the individual parts of the report, and (g) to facilitate the decision making process. (p. 491)

Sattler (1982) presented several additional prescriptions that were adapted from Moore (1969), who apparently obtained them from Strunk and White (1959). Regardless of their origins, many of these prescriptions are worth noting again:

1. Use definite, specific concrete language. Prefer the specific to the general, the definite to the vague, the concrete to the abstract.
2. Do not take shortcuts at the cost of clarity.
3. Avoid fancy words.
4. Omit needless words. Make every word tell.
5. Express coordinate ideas in similar form. The content, not the style, should protect the report from monotony.
6. Do not overstate.
7. Avoid the use of qualifiers. Rather, very, little, pretty . . . these are the leeches that infest the pond of prose, sucking the blood of words.
8. Put statements in positive form. Make definite assertions. Avoid tame, colorless, hesitating noncommittal language. (p. 492–493)

In summary, the report should adhere to the data obtained in the interview. Little is to be gained from making strong inferences, particularly following the first interview.

## CONCLUSIONS

We have attempted to address many of the issues we thought would be of interest to the practitioner, as well as to the researcher who is looking for fertile

ground in an area that is in embarrassing need of research. Interviewing children and significant others can be thoroughly enjoyable, particularly when one notes the similarities between the interviewer and the detective. Both are faced with incomplete information, with different parties indicating that someone else is at fault, and with various clues that initially do not seem to fit together. There are no substitutes for a thorough understanding of one's own behavior and how it influences and is influenced by the behavior of others. Armed with this knowledge and a knowledge of child development, one is prepared to confront the most difficult case. Clinical interviewing is an art only to the extent that researchers have not provided empirical support for our practices. We are all guided by our successes and failures in interviewing and can learn from shared experiences. We have attempted to share the fruits of some of our experiences and research, as well as those of noted clinicians and researchers.

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# III      Assessment of Specific    Disorders

# 9 *Developmental Learning Disorders*

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## INTRODUCTION

Comparative discussions of mental retardation and learning disabilities yield a surprising number of varied opinions regarding both definitions and the relationship of each disorder to the other. In an informal survey conducted by Tylanda (1983), college freshmen were asked to define mental retardation and learning disabilities at the outset of an educational psychology course. Some students stated that mental retardation and learning disabilities were the same type of disorder (i.e., slowness in the learning process) and merely existed at different points on a continuum. Others stated that they were mutually exclusive disorders related to cognitive functioning. However, the vast majority of the students sampled stated that learning disabilities had to do with deficits in one's ability to read or write, whereas mental retardation was a type of mental illness. Strongly influenced by the majority's ill-defined concept of mental retardation as a mental health issue, the results of the survey were attributed to naïveté.

In retrospect, this decision may have been short-sighted. It would appear that the beliefs of these freshman students were a surprisingly accurate portrayal of the divergent perspectives currently plaguing the learning disorders field. Paramount is the problem of definition. Educators and medical personnel, for example, use different working definitions for both mental retardation and learning disabilities. Medical references generally separate mental retardation and learning disabilities as mutually exclusive categories, whereas educational sources espouse the idea that such disorders may coexist for an individual. Although the definitional issue can be resolved on theoretical grounds, one is left questioning the clinical utility of concurrently diagnosing an individual as both mentally retarded and learning disabled.

In this chapter, the differential diagnosis of mild mental retardation and learning disabilities is examined. To create the context for this discussion, histor-

ical overviews on mental retardation and learning disabilities are provided. Current definitions and assessment procedures are also discussed. Following these sections, theoretical and contemporary clinical issues in the differential diagnosis of learning disorders are addressed. The chapter concludes with a summary of the relationships between mild mental retardation and learning disabilities, along with recommendations for additional clinical research having direct bearing on the differential diagnosis of learning disorders.

## MENTAL RETARDATION

### *Historical Overview*

References to mentally retarded persons can be traced to early history, and numerous accounts are found in the Bible, the Koran, and the Talmud. Historical reviews of ancient Greek and Roman literature indicate that mentally retarded individuals, along with physically handicapped individuals, were typically abandoned, killed, or exploited in a dehumanizing manner. In ancient Rome, for example, it was not uncommon for parents to drown their mentally retarded children, and the wives of the most affluent Greeks and Romans used mentally retarded individuals to entertain guests (Poling & Breuning, 1982). All such activities, completely devoid of humanity, were carried out under the Greek and Roman philosophy that mental retardation, like physical anomalies, was contrary to the concept of the "total man."

With the emergence of Christianity and the teachings of "compassion" and "brotherly love," the fate of mentally retarded and other disabled persons was better, and increasing numbers of handicapped individuals were cared for by private families. However, each age's unique interpretation of Christian doctrine resulted in constantly changing attitudes toward and treatment of the mentally retarded. For example, early in the Middle Ages, some viewed the mentally retarded as "infants of God" and regarded their garbled speech as divine revelation (Poling & Breuning, 1982). Thus, they were free to wander undisturbed. Yet, by 1150 A.D., the notion of mental retardation as a reflection of parental sin was commonly accepted. As a result, once again, restrictions and harsh treatment became common practice. Later, during the Renaissance and Reformation periods, these individuals were regarded as demoniacally possessed. Exorcisms and purgings were carried out on mentally retarded individuals, and some probably were burned as witches. This age of so-called Enlightenment was followed by a period of compassion and protection for these individuals. Religious orders established institutions to care for mentally retarded as well as physically deformed and handicapped individuals. Under religious direction, they received food, clothing, shelter, and protection from abuse and physical harm. By the middle of the seventeenth century, numerous public facilities were in place throughout western Europe. However, with time, conditions became crowded and unsanitary, and lay personnel were uncaring and, often, brutal in their treatment.

During the latter half of the eighteenth century, the ideas of Locke, Rousseau, Pestalozzi, Froebel, and Pereira influenced new directions in special education and resulted in the establishment of successful educational programs for deaf and blind persons. Though these programs did not serve mentally retarded individuals directly, their philosophies and methods provided a basic model for subsequent treatment approaches for the mentally retarded.

Systematic attempts to teach and habilitate the mentally retarded began in the early nineteenth century, when Itard, the French physician, attempted to educate Victor, the inarticulate 11-year-old boy who was discovered by hunters in the forest of Aveyron. Using techniques similar in theory to current behavior modification methods, Itard aided Victor in developing adequate self-care, social, and receptive language skills over a five-year period. Though he considered his techniques a failure because Victor did not develop speech, Itard's methods suggested that mentally retarded individuals could acquire and refine a variety of adaptive behaviors through systematic training. Sequin, a student of Itard, continued developing his mentor's techniques and, by the mid-nineteenth century, had established educational programs for the mentally retarded that greatly accelerated interest in this population throughout Europe.

Strongly influenced by Sequin's work, educational and habilitative institutions were established throughout western Europe and the United States. By 1875, more than 25 institutions were operating in the United States with approximately 15,000 mentally retarded individuals in residence (Maloney & Ward, 1979). By 1900, institutions in the United States had expanded in number and size and served a multiply handicapped population as well as normal epileptics. Although these institutions were originally established to educate and habilitate, by the late 1930s they were functioning solely as holding facilities, where minimal custodial care was provided.

This enormous reversal in patient care resulted from a variety of circumstances. First, government funds were being diverted to other sources as a result of World War I and the Great Depression of the 1930s. Second, although the goal of residential facilities was to aid individuals in securing successful placement in the community, few mentally retarded individuals were adapting adequately, and the result was high rates of recidivism. Third, state institutions enjoyed marginal success in teaching basic classroom skills to this population, so more families were placing their mentally retarded offspring in such residences. Finally, the eugenics movement (a scientific discipline geared to "improving" inherent racial qualities) of the late 1800s and the early 1900s had a significant impact on society's view of the mentally retarded. Because eugenics *allegedly* provided proof that mental retardation was inherited and fixed, as well as evidence that those afflicted were dangers to society, much pressure was placed on families to send their mentally retarded offspring away from the community, to place them in institutions, and to have them sterilized. By the late 1930s, institutions were overcrowded and provided pathetic care for their residents. The commitment to educate and habilitate mentally retarded individuals that had led to the original formation of residential facilities had been lost.

New and significant advances came with the end of World War II. The

country entered a period of financial prosperity. Money was reinvested in old government programs, and community services were emphasized and expanded. However, institutional conditions in many facilities continued to deteriorate, and institutional reform was actively sought by both parents and professionals. In 1950, parents of mentally retarded individuals banded together and founded the National Association for Retarded Children (now the National Association for Retarded Citizens), and in 1953, institutional standards were developed by the American Association on Mental Deficiency. Special educational provisions expanded throughout the United States, with a growing concern for the young student, the adolescent, and vocational training. At the same time, the medical and scientific community accelerated research in areas bearing on mental retardation, with particular emphasis on heredity, neuroanatomy, neurophysiology, and brain-behavior relationships. In 1961, President John F. Kennedy provided a national incentive to meet the needs of the mentally retarded and the mentally ill and appointed a special President's Panel on Mental Retardation. The panel published a report in 1962 that established goals and guidelines for future development. This document has served as a base for the continued commitment to improving the quality of life for mentally retarded citizens.

### *Etiological Trends*

Historically, there has been a tendency to view mental retardation as dichotomous rather than as homogeneous (Hooper & Boyd, 1986). Within this framework, the etiology is considered nonorganic for the majority of mentally retarded individuals (75%–80%), and the condition is referred to as *cultural-familial retardation*. Generally, this group of mentally retarded individuals has been described as biologically intact with abnormalities resulting from a normally distributed polygenetic controlled set of attributes and/or from impoverished surroundings and a lack of cultural opportunities. In contrast, the second group (comprising the remaining 20%–25%) has been identified as having clear, though varied, forms of brain damage.

Within recent years, this dichotomous etiologically perspective on mental retardation has been challenged (Baumeister & MacLean, 1979; Masland, 1958; Tredgold & Soddy, 1963), and contemporary researchers advocate that mental retardation be conceptualized as existing along a continuum of neurological impairment (Baumeister & MacLean, 1979). In support of this contention, Luria (1963) noted that no distinction should be made between mentally retarded individuals having known organic impairment and the larger group whose mental retardation is of unknown etiology. Consistent with this position, recent studies have repeatedly documented neuropathology in mentally retarded individuals not diagnosed as having brain dysfunction (Crome, 1960; Gonatas, Evangelista, & Walsh, 1967; Huttenlocher, 1974, 1975; Purpura, 1974; Sylvester, 1983), with a tendency for the less severe cases of mental retardation to exhibit milder brain anomalies (Freytag & Lindenberg, 1967; Jellinger, 1972; Malamud, 1964).

To date, mental retardation may be attributed to over 200 known causes (Cleland, 1983), with medical classification grouped into three major categories: (1) genetic factors (e.g., transmission through dominant or recessive genes; chromosomal, metabolic, and structural brain defects); (2) high-risk physical factors occurring after conception (e.g., teratogenesis, toxins, infections, trauma, anoxia, malnutrition); and (3) social factors (e.g., poverty, poor cognitive or language stimulation, inadequate schooling). Current work also suggests that brain pathology is pervasive throughout the range of mental retardation (Baumeister & MacLean, 1979).

### *Definition*

Arriving at a consensual agreement among professionals on a working definition of mental retardation has been an arduous task, and revisions have been numerous. The repeated updating of the definition has resulted partially from the need to have a single definition that can be applied to children, adolescents, and adults, as well as from the need to eliminate the definitional inconsistency existing between professional organizations. Amid these revisions, the American Association on Mental Deficiency (AAMD) has consistently provided the most widely used definition. Since 1973, the AAMD has defined mental retardation on the basis of three diagnostic criteria: (1) significantly subaverage general intellectual functioning; (2) concurrent deficits or impairments in adaptive behavior; and (3) onset during the developmental period. All three components of this definition must be met in order for an individual to be considered mentally retarded. As quoted from the AAMD's 1977 revision of *Classification in Mental Retardation* (Grossman, 1977):

GENERAL INTELLECTUAL FUNCTIONING is defined as the results obtained by assessment with one or more of the individually administered general intelligence tests developed for the purpose of assessing intellectual functioning.

SIGNIFICANTLY SUBAVERAGE INTELLECTUAL FUNCTIONING is defined as two or more standard deviations (SD) below the mean on standardized tests of intelligence.

ADAPTIVE BEHAVIOR is defined as the effectiveness or degree with which individuals meet the standards of personal independence and social responsibility expected for age and cultural group.

DEVELOPMENTAL PERIOD is defined as the period of time between birth and the 18th birthday. (p. 1)

The American Psychiatric Association (1980) in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) adopted the AAMD definition with minor variation. The DSM-III differs from the 1977 AAMD manual in that it defines "significantly subaverage intellectual functioning" as "an intelligence quotient (IQ) of 70 or below on an individually administered IQ test" (p. 36).

In 1983, the AAMD again revised its definition of mental retardation in an attempt to reflect worldwide consistency (i.e., with the ninth edition of the *International Classification of Diseases* [ICD-9] of the World Health Organization and with the American Psychiatric Association's DSM-III). The change was limited to the definition of "significantly subaverage intellectual functioning" and



moved from the wording "two or more standard deviations (SD) below the mean" (Grossman, 1977, p. 1) to "approximately an IQ of 70 or below" (Grossman, 1983, p. 1).

It would appear that the AAMD's agreement to change its definition from the standard deviation method to an approximately defined IQ score was based on the fact that the majority of the frequently used standardized intelligence tests (e.g., the Wechsler scales) have a mean of 100 and a standard deviation of 15. Thus, on these standardized intelligence tests, an IQ two standard deviations below the mean equals an IQ of 70. However, such a revision in definition is an issue of concern for users of intelligence tests that do not have a standard deviation of 15 IQ points, such as the Stanford-Binet, Form L-M (Terman & Merrill, 1960), the McCarthy Scales (McCarthy, 1972), the Pictorial Test of Intelligence (French, 1964), the third edition of the Columbia Mental Maturity Scale (Burgemeister, Blum, & Lorge, 1972), and the Bayley Scales of Infant Development (Bayley, 1969). For example, according to former AAMD (Grossman, 1973, 1977) definitions, "significantly subaverage intellectual functioning" was classified as an IQ of 68 or below on the Stanford-Binet Intelligence Scale but as an IQ of 70 or below on the Wechsler scales. In the new AAMD (Grossman, 1983) definition, a person obtaining an IQ of 70 on the Stanford-Binet may be considered mentally retarded (assuming the other two criteria are met) when, in fact, the obtained score does not deviate from the grand mean score in the same manner as a cohort's IQ of 70 would on a Wechsler test. Although it may appear that we are haggling merely over a few points, we are really questioning the efficacy of precisely defined statistical parameters when they ignore the fundamentals of psychometrics and standardized test construction. The earlier AAMD definition appears to have been more representative of test measurement and statistical comparison because it took into account the fact that each standardized intelligence test has a different standard deviation from the mean IQ of 100, and that the use of the standard deviation permits the *precise* interpretation of individual scores within a distribution.

Although debate over the more appropriate definition of "significantly subaverage intellectual functioning" goes beyond the scope of this chapter, the objective in pointing to this issue is to alert professionals to the recent change in definition, as this change potentially impacts rather significantly on the classification scheme for subaverage intelligence. It appears that the AAMD has anticipated the difficulties that will accompany its most recent revision in definition by choosing to include the word *approximately* when defining "significantly subaverage intellectual functioning," though the DSM-III does not. By adopting a compromise position, the AAMD indirectly adheres to its previous definition and seeks to avoid statistical debate while maintaining interagency consistency.

### *Mental Retardation Subtypes*

With regard to the classification of mental retardation (see Table 1), the latest AAMD manual and the DSM-III both list four levels of mental retardation: mild, moderate, severe, and profound. These four subclassifications have been

TABLE 1. Comparative Classification Methods of Mental Retardation

Current	Terminology		Standard deviation range	AAMD (1977)		DSM-III (1980)	AAMD (1983)
	Historical	Educational		IQ range by SD			
				SD = 16	SD = 15		
Mild MR	Moron	Educable	-2.01 to -3.00	68-52	69-55	50-70	50-55 to approx. 70
Moderate MR	Imbecile	Trainable	-3.01 to -4.00	51-36	54-40	35-49	35-40 to 50-55
Severe MR	Idiot	Trainable (Dependent)	-4.01 to -5.00	35-30	39-25	20-34	20-25 to 35-40
Profound MR	Idiot	Custodial (Life Support)	below -5.01	19 and below	24 and below	Below 20	Below 20 or 25

used for some time, with mild mental retardation being roughly equivalent to the education term *educable*, moderate mental retardation being equated with the education term *trainable*, and severe and profound mental retardation being equated with the education terms *trainable (dependent)* and *custodial (life support)*, respectively. As in the 1973 and 1977 AAMD revisions, the category of borderline intellectual functioning continues to be eliminated as a classification subgroup of mental retardation.

A major difference between the AAMD's 1977 and 1983 classification criteria is the elimination of standard deviation bands as the basis for current grouping, a modification consistent with the recent change in definition. However, it is particularly noteworthy that this revision by the AAMD did not result in complete conformity with the DSM-III. In fact, it has led to a major difference between each agency's criteria for determining levels of mental retardation. Whereas the DSM-III uses distinct IQ "cutoff" points, the AAMD has replaced its standard deviation band with a range of scores at each end of each level in accordance with the belief "that there is some error of measurement in all tests, that tests differ somewhat in standard deviations and thus meaning of the obtained IQ, and the importance of using very sound clinical judgment in deciding on level of retardation" (Grossman, 1983, p. 126). Thus, rather than leading to consensual agreement and simplification for the clinician, these recent revisions have put increased responsibility on clinicians and educational personnel for the appropriate diagnostic placement of individuals within a category.

### *Assessment Issues and Prevalence Estimates*

The definition of mental retardation indicates that, in addition to age, two criteria must be evaluated in making classifications: level of intelligence and level of adaptive behavior. Classifying an individual as mentally retarded is appropriate only when the person being assessed falls into the mentally retarded category for both intellectual *and* adaptive behavior functioning. Assessment of the first criterion requires completion of a standardized, individually administered intelligence test. Assessment of adaptive behavior is less clear and may take the form of a variety of objective scales, such as the AAMD Adaptive Behavior Scale (Nihira, Foster, Shellhaas, & Leland, 1975), the Adaptive Behavior Inventory for Children (Mercer & Lewis, 1978), or the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 1984), or it may rest solely on clinical judgment.

Both methods of assessing adaptive behavior have shortcomings. Though a number of objective scales for assessing adaptive behavior are currently available, no clear criteria exist for establishing whether an individual's behavior is adaptive or fails to meet expected levels of functioning regarding chronological age. For example, on Part I of the AAMD Adaptive Behavior Scale (Nihira *et al.*, 1975), 10 behavior domains considered important to the development of personal independence in daily living are rated. However, no overall criterion score has been set. Does the individual need to fall into the significant range (>sixtieth percentile score) on 6 of the 10 categories, 8 of the 10 categories, or on all 10 categories? Further, "norming" of this scale was conducted solely on a develop-

mentally disabled population. Consequently, scores in the "significantly elevated range" are only in comparison to scores of other developmentally disabled individuals. Thus, very little is learned about those individuals who score in the "normal range" of this scale. The adaptive behaviors of this group also may be significantly inferior when compared to those of a developmentally nondisabled population. The accompanying manual for the AAMD Adaptive Behavior Scale (Fogelman, 1975) attempts to address its inherent weakness with the following caveat:

The AAMD Adaptive Behavior Scale must not be used, in and of itself, to determine an individual's level of adaptive behavior. . . . It is one of the assessment devices and techniques which, in conjunction with others, can be used to help determine an individual's adaptive behavior level. (p. 8)

However, without objective, psychometrically derived criteria, clinical judgment will persist as the foremost determinant of adaptive behavior. Other objective scales reduce to similar situations, despite efforts to the contrary. For example the newly revised Vineland Adaptive Behavior Scales (Sparrow *et al.*, 1984), which provide an adaptive behavior composite score with a mean of 100 and a standard deviation of 16, repeatedly require the rater to make clinical judgments throughout the interviewing process. Thus, with regard to the assessment of adaptive behavior, it appears that the clinician may make repeated use of "objective scales" as encouraged, but that clinical judgment will continue as the final determinant of whether an individual is adequately meeting the personal responsibility and social demands of daily living.

Considering the methods available to assess adaptive behavior, it is not surprising that clinicians' compliance with this two-dimensional system for classifying mental retardation has been more apparent than real. Adams (1973), Junkala (1977), and Roszkowski and Spreat (1981) found that even if adaptive behavior measures were available, many professionals would still be inclined to base their diagnosis primarily on IQ. This practice is unfortunate, given the growing evidence that IQ alone underestimates an individual's overall adaptive skills (Mastenbrook, 1978; Roszkowski & Spreat, 1981). Further, investigators (e.g., Silverstein, 1973; Tarjan, 1970) have reported that the proper application of diagnostic criteria results in a lowering of the prevalence rates for mental retardation. According to Tarjan (1970), by IQ standards alone, about 3% of the U.S. population is mentally retarded. Yet, if both IQ and adaptive behavior are entered in the diagnostic equation, a reduction in prevalence to approximately 1% is reported, the discrepancy being due to "disharmony between the IQ score and reasonable success in adaptation" (p. 749). Thus, rather than ignoring current adaptive behavior measures (cf. Coulter & Morrow, 1978) and eliminating them from among the diagnostic criteria, it is preferred that a quantitative definition of adaptive behavior be included in the definition of mental retardation and that psychometric instrumentation for assessing adaptive behavior be introduced. Until this occurs, there appears to be much too much room for individual clinician differences in the diagnosis and the subtype classification of mental retardation to expect accuracy.

## LEARNING DISABILITIES

### *Historical Overview*

Trends in the area of mental retardation have contributed significantly to the evolution and development of the concept of learning disabilities (Hallahan & Cruickshank, 1973), particularly as regards evolving etiological (McCandless, 1965; Strauss & Lehtinen, 1947), definitional (Kirk, 1976), and treatment (Kirk & Kirk, 1971) perspectives. Given the growing concern about a better understanding of learning problems, Larsen (1976) has suggested that learning disabilities represent one of the largest, and perhaps most controversial, categories in special education.

Historically, it has been nearly 100 years since specific learning problems were described in children. Using a case study format, Hinshelwood (1895), Morgan (1896), and Bastian (1898) each described learning problems in children, particularly reading difficulties, that resembled those deficits typically found in adults with known brain damage. Following these case reports, Hinshelwood (1900, 1902, 1909) presented a series of cases that suggested a familial relationship in the disorder that was termed *congenital word blindness*. Thus, by the early 1900s, the foundation for the study of learning disabilities was firmly established (Hooper, Boyd, & Hynd, 1986). Of particular importance in this historical context was the assumption that the deficiency in learning was related to neurodevelopmental deficits in the left cerebral hemisphere. Although other areas of the brain have been implicated in learning disabilities (e.g., Rourke, Bakker, Fisk, & Strang, 1983), it should be noted that it has taken nearly seven decades of research to establish the validity of these earlier findings.

The study of learning disabilities has been promoted by the convergence of two basic lines of research (Hooper *et al.*, 1986). The first line of research had its beginnings with Samuel Orton (1928), who observed that many children with severe learning difficulties had problems applying hemispherically lateralized cognitive processes in their learning. These children typically evinced letter and word reversals in their reading, and they manifested lateralized motor deficits. Orton hypothesized that these children had failed to develop normal cerebral dominance for visual-perceptual and linguistic processing. Although recent reviews of the cerebral dominance literature (e.g., Kinsbourne & Hiscock, 1981) have dispelled much of Orton's original paradigm, the importance of his thinking cannot be overemphasized in that it attracted investigators from the fields of medicine, education, and psychology and thus further advanced the field of learning disabilities.

The second line of research, which contributed to conceptualizing learning problems from a neurobiological base, related to the localization of function in the brain. The early work of Broca (1861), Wernicke (1874), and Jackson (1876) has contributed significantly to the understanding of brain-behavior relationships in learning difficulties. These early investigators reported that specific neuroanatomical deficits were related to specific functional behaviors (e.g.,

motor functions and expressive and receptive speech). Generally, localization theory assumed that complex mental activity could be narrowly localized to discrete areas of the brain. Although this thinking was directly opposed by proponents of equipotential theory (Conrad, 1948; Goldstein, 1948; Lashley, 1938), who viewed the execution of all complex functions as depending on the equal participation of all areas of the brain, there has been a recent revival of localization theory (Heilman & Valenstein, 1979). This reawakening has been due largely to the growing body of literature regarding specific brain-behavior relationships (Geschwind, 1974; Penfield, 1959; Sperry, 1973) and functional systems (Luria, 1963), to the progress of technology in providing better methods of observing neuroanatomical changes in the central nervous system and their behavioral manifestations (e.g., computerized axial tomography, magnetic resonance imaging, and positron emission tomography), and to neuropathological and cytoarchitectonic evidence about the structural basis of neurodevelopmental learning disorders (Drake, 1968; Galaburda & Eidelberg, 1982; Galaburda & Kemper, 1979; Galaburda, Sherman, Rosen, Aboitiz, & Geschwind, 1985).

### *Etiological Trends*

The convergence of these two lines of research not only provided the neurological foundation for learning disabilities (Rosen, Sherman, & Galaburda, 1986) but also contributed to thinking regarding the etiology of learning disabilities. Although no known etiology exists for these neurodevelopmental learning disorders in general, there is some speculation that they may result from chance variation during sensitive periods of neuroanatomical development, from congenital factors, from autoimmune disease (Rosen & Galaburda, 1984; Sherman, Galaburda, & Geschwind, 1983), or from cytomegalovirus infection (Bray, Bale, Anderson, & Kern, 1981). Clinically, however, there is firm evidence implicating neurobiological processes, though not necessarily brain damage *per se*, with learning disability. To date, the major factors involved in contributing to a learning disability appear to be (1) neurobiological (i.e., neurological, genetic, and malnutrition); (2) psychological and psychiatric; and (3) sociological or environmental (Gaddes, 1985; Wong, 1979).

### *Definitional Issues*

To date, a clear definition of learning disabilities has not been put forth. In fact, a myriad of terminology and poor definitions has plagued clinicians and researchers interested in the child with a learning disability. Perhaps no other single diagnosis provides the expansiveness of conditions that can be subsumed under its heading. Over the years, this disorder has been called *dyslexia*, *perceptual handicap*, *neurological impairment*, *minimal brain dysfunction*, and *cerebral dysrhythmia*, to name only a few labels (Spears & Weber, 1974).

Although the conceptualization of childhood learning disorders has spanned nearly a century, dating back to Morgan's case (1896) of congenital

word blindness, it was not until 1962 that the term *learning disability* emerged (Kirk & Bateman, 1962), defined as follows:

*A learning disability refers to a retardation, disorder, or delayed development in one or more of the processes of speech, language, reading, writing, arithmetic, or other school subjects resulting from a psychological handicap caused by a possible cerebral dysfunction and/or emotional or behavioral disturbances. It is not the result of mental retardation, sensory deprivation, or cultural or instructional factors. (p. 73)*

As can be seen from this definition, the term *learning disability* was not limited to learning difficulties due solely to neurobiological factors, but it did exclude learning problems due to sociological and cultural factors. The Kirk and Bateman (1962) definition represented the first attempt at bringing cohesiveness to this rapidly growing field.

Five years later, the National Advisory Committee on Handicapped Children (NACHC, 1968) developed a definition of learning disabilities that sought to improve on the initial attempt by Kirk and Bateman (1962). In 1975, this definition was incorporated into the Education for All Handicapped Children Act, better known as P.L. 94-142 (*Federal Register*, 1976). A learning disability was defined as

a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, or environmental, cultural, or economic disadvantage. (*Federal Register*, 1976, p. 46977)

This definition was adopted by most state education departments and, being a legal mandate, required due-process guidelines for identifying and providing services to the learning-disabled individual. Although this definition alludes to a neurobiological basis for learning disabilities, the specific details are left open for interpretation. Although generally considered an improvement over the initial attempt, the definition continued to lack an operational component on which researchers and clinicians could function.

McCarthy (1975) attempted to operationalize the NACHC (1968) definition by stating that (1) the learning disabled youngster does not learn despite average intellectual potential (usually IQs greater than 85) and adequate opportunities; (2) a significant discrepancy exists between the child's demonstrated academic aptitude and her or his academic achievement; and (3) this discrepancy is significant enough to require specialized intervention. Other attempts at operationalizing this definition, such as expectancy formulas for determining a significant discrepancy between ability and achievement, deviations from grade level, regression analysis, and standard score comparisons, have met with limited success (Cone & Wilson, 1981; Forness, Sinclair, & Guthrie, 1983; Shepard & Smith, 1983).

Although the discrepancy issue postulated by McCarthy (1975) is central to distinguishing learning disabilities from other neurodevelopmental disorders, it

has been a problematic concern (Algozzine, Ysseldyke, & Shinn, 1982b). Algozzine and Ysseldyke (1983) went as far as to question the entire concept of learning disability, preferring instead to focus on the low achievement of this population as the primary defining feature. However, recent evidence has provided support for learning disability as a valid concept (Wilson, 1985).

The concept of learning disability has also surfaced within the psychiatric domain. The *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III; American Psychiatric Association, 1980) describes at least six specific developmental disorders, including disorders of reading, arithmetic, language (expressive and receptive type), articulation, and a mixed specific developmental disorder, which is a combination of the other disorders. These disorders are usually mutually exclusive from pervasive learning disorders (e.g., mental retardation), are related to both biological and nonbiological etiological factors, and do not reflect characteristics of individuals experiencing a temporary developmental delay in a particular area. However, inconsistencies exist within the DSM-III diagnostic framework, as evidenced by the statement that mental retardation may coexist with the specific developmental disorders of reading (American Psychiatric Association, 1980, p. 94) and arithmetic (American Psychiatric Association, 1980, p. 94) and arithmetic (American Psychiatric Association, 1980, p. 95); the result is further confusion regarding the diagnosis of learning disabilities. Although a significant improvement over the DSM-II criteria (American Psychiatric Association, 1968), which provided only a single diagnostic category (i.e., specific learning disturbance), DSM-III descriptions of specific developmental disorders provide little in the way of clarification for the field of learning disabilities.

In an effort to generate a more acceptable definition for learning disability, representatives of six organizations formed the National Joint Committee for Learning Disabilities (NJCLD). The organizations comprising the NJCLD included the Association for Children and Adults with Learning Disabilities, the American Speech-Language-Hearing Association, the Council for Learning Disabilities, the Division for Children with Communication Disorders, the International Reading Association, and the Orton Dyslexia Society (Hammill, Leigh, McNutt, & Larsen, 1981). This committee recommended the following definition for learning disabilities:

Learning disability is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction. Even though a learning disability may occur concomitantly with other handicapping conditions (e.g., sensory impairment, mental retardation, social and emotional disturbance) or environmental influences (e.g., cultural differences, insufficient/inappropriate instruction, psychogenic factors), it is not the direct result of those conditions or influences. (Hammill *et al.*, 1981, p. 336)

This definition represents an improvement over previous attempts on at least three accounts. First, the proposed definition specifically recognizes the heterogeneous nature of learning disabilities and formally provides the conceptual foundation for subtype analysis of this group of disorders. Second, the defini-



tion better acknowledges the neurobiological basis hypothesized for this disorder and thus formally recognizes its historical development within a neurological framework. Finally, the definition allows for a learning disability to exist concurrently with other handicapping conditions. Such improvements are noteworthy, particularly as they relate to formally establishing the learning disability concept within a neurological framework and to acknowledging the heterogeneity of the disorder; however, this definition, like its predecessors, continues to suffer from a lack of specificity that will haunt the clinician and researcher working with this population. Efforts to improve this aspect of the definition continue (Boyan, 1985; Tittmore, Lawson, & Inglis, 1985).

### *Learning Disability Subtypes*

Given the NJCLD (Hammill *et al.*, 1981) definition, it would appear to benefit both researchers and clinicians alike to search for more homogeneous subtypes of learning disabilities. Much of the earlier work with children experiencing learning problems attempted to identify the single deficient process that was contributing to the learning difficulties. As might be expected, these investigations resulted in a multitude of single-factor theories ranging from deficits in cerebral dominance (e.g., Orton, 1928) and deficiencies in various perceptual processes (e.g., Lyle & Goyen, 1975) to perceptual-motor abilities (e.g., Kephart, 1964) and poor cross-modal integration (e.g., Birch & Belmont, 1965), to name but a few. These single-factor theories contributed to conceptualizing learning disabilities as a heterogeneous group of disorders and provided the catalyst for subtype analysis.

Learning-disability subtype analysis has produced numerous models to date. Given the apparent high frequency of reading problems in school-aged children, many of the models have concentrated on identifying subtypes of reading disability. Generally, there appear to be at least three subtypes of reading disability. One subgroup tends to evidence auditory-linguistic deficits while maintaining adequate visual-spatial skills, a second subgroup demonstrates the reverse pattern, and the third subgroup manifests deficits within both processing domains (e.g., Bateman, 1968; Boder, 1970; Kinsbourne & Warrington, 1963; Mattis, French, & Rapin, 1975; Pirozzolo, 1979). Other models have attempted to include motor and sensory deficits in their subtypologies as well (Fisk & Rourke, 1979; Lyon & Watson, 1981; Mattis *et al.*, 1975). In addition to reading disability subtypes, other investigators have identified subtypes of disabled spellers (Nelson & Warrington, 1974; Sweeney & Rourke, 1978), as well as arithmetic disability subtypes (Rourke & Finlayson, 1978; Rourke & Strang, 1978). Table 2 provides a summary of the studies completed to date exploring learning disabilities from a subtyping perspective.

Although we are just at the beginning, it seems that the potential number of learning disability subtypes may be limited only by the sophistication of the assessment measures used (Hynd, Obrzut, Hayes, & Becker, 1986). The search for a heuristic, yet clinically valid, model for learning disability subtypes will hinge on appropriate assessment strategies (Hynd *et al.*, 1986), etiological and

TABLE 2. Studies Investigating Subtypes of Learning Disabilities

Date	Investigator(s)	Description of subtype(s)
1963	Kinsbourne and Warrington	Verbally deficient readers Spatially deficient readers
1964	Quiros	Auditory dyslexia Visual dyslexia
1966	Bannatyne	Neurological dyslexia Genetic dyslexia
1967	Johnson and Myklebust	Audiophonic dyslexia Visuospatial dyslexia
1968	Bateman	Auditory memory subgroup Visual memory subgroup Combined subgroup
1970	Boder	Dysphonetic dyslexia Dyseidetic dyslexia Alexic dyslexia
1970	Ingram, Mason, and Blackburn	Audiophonetic subtype Visual-spatial subtype Combined subtype
1971	Rourke, Young, and Flewelling	Performance IQ > Verbal IQ Performance IQ < Verbal IQ Performance IQ ≈ Verbal IQ
1972	Naidoo	Reading and spelling deficits Spelling deficits only
1974	Nelson and Warrington	Reading and spelling deficits Spelling deficits only
1975	Mattis, French, and Rapin	Language disordered Articulatory and graphomotor dyscoordination Visual-perceptual deficits
1977	Doehring and Hoshko	Linguistic deficits Phonological deficits Intersensory integration deficits Visual-perceptual deficits
1977	Smith, Coleman, Dokecki, and Davis	High IQ group Low IQ group
1978	Sweeney and Rourke	Reading and spelling deficits Spelling deficits
1978	Rourke and Finlayson	Reading, spelling, and arithmetic deficits Reading- and spelling-deficient group Arithmetic-deficient group
1978	Omenn and Weber	Auditory deficits Visual deficits Mixed subtype
1978	Mattis, Erenberg, and French	Phonemic sequencing deficits Language deficits Articulatory-graphomotor deficits Visual-perceptual deficits Subtypes with two of the above
1979	Petrauskas and Rourke	Left temporal lobe deficits Posterior left hemisphere deficits
1979	Fisk and Rourke	Auditory-verbal-processing, visual-sequencing, and finger-localization deficits

(continued)

TABLE 2 (Continued)

Date	Investigator(s)	Description of subtype(s)
1979	Vernon	Auditory-verbal-processing and motor deficits Word-blending, memory, and fingertip-number-writing deficits Deficits in analyzing visual shapes Deficits in analyzing whole words into phonemes Deficits in the acquisition of grapheme-phoneme associations Deficits in grasping irregularities in grapheme and phoneme associations and complex orthography Deficits in grouping single words into phrases and sentences
1979	Pirozzolo	Auditory-linguistic subtype Visual-spatial subtype
1979	Doehring, Hoshko, and Bryans	Linguistic deficits Phonological deficits Intersensory integration deficits Visual-perceptual deficits
1980	Coltheart, Patterson, and Marshall	Deep dyslexia
1981	Doehring, Trites, Patel, and Fiedorowicz	Type O (oral reading disability) Type A (associative reading disability) Type S (sequential reading disability)
1981	Satz and Morris	Global language subtype Specific language subtype Visual-perceptual subtype Mixed subtype
1981	Lyon and Watson	Normal pattern with low reading achievement Language-comprehension, auditory-and-visual-memory, sound-blending, and visual-spatial deficits Language-comprehension, auditory-memory, and visual-motor-integration deficits Aphasic subtype
1982	Thompson	Expressive and receptive language deficits Visuoperceptive deficits Normal pattern with low reading achievement Auditory-linguistic deficits Visuospatial deficits Mixed deficits
1982	Deloche and Andreewsky	Surface dyslexia
1983	Sevush	Surface dyslexia Deep dyslexia Phonological dyslexia
1983	Watson, Goldgar, and Ryschon	Language-disordered subtype Visual-processing subtype Minimal deficits subtype
1984	McKinney	Sequential and spacial deficits; deficiencies in independence and task orientation; mildly impaired in math and reading recognition Lower VIQ than PIQ; severely impaired in all academic and behavioral areas

(continued)

TABLE 2 (Continued)

Date	Investigator(s)	Description of subtype(s)
1984	Meacham and Fisher	High conceptual skills; mildly impaired academics; less considerate and hostile Sequential and spacial deficits; impaired in all academic areas; no behavioral disorder Reading-disabled Language-disabled
1985	Speece, McKinney, and Applebaum	Deficits in task orientation and independence Normal behavioral pattern, with high considerateness and introversion Normal behavioral pattern, with low considerateness and high hostility Mild attention deficits, with high distractibility and hostility and low considerateness Withdrawn and overly dependent Mild global behavioral disorder Impaired in all classroom behaviors
1985	Snow and Hynd	Expressive and receptive language deficits with impaired reading, spelling, and arithmetic Reading and spelling deficits Expressive-and-receptive-language and tactile-perceptual deficits

treatment validation (Lyon, 1985), and an integration of this already burgeoning body of literature. This will enable the clinician and researcher to begin to appropriately apply relevant findings to further refine subtype analysis.

### *Assessment Issues*

Children experiencing specific learning difficulties are administered various educational and psychological tests for two major purposes, each purpose having a unique frame of reference. First, the tests are used to identify those individuals experiencing significant learning problems who will require special-education involvement. Second, tests are administered to gather information pertinent to an individual's particular pattern of strengths and weaknesses with the hope of designing appropriate remedial strategies and instructional objectives (Wallace & Larsen, 1978). Schlieper (1982) noted that the former reason for testing typically involves a normative approach, in which an individual is compared to a reference group, and that it is useful for diagnosis. However, this approach becomes less useful when applied to the prescriptive aspect of assessment (Kratochwill, 1977; Ozer, 1980; Ross, 1976), and it is here that the second type of testing becomes important. It is this type of testing, identifying patterns of relative strength and weakness, that provides qualitative information with respect to how a child problem-solves; performs reading, spelling, and math; uses situational cues; and functions in social interaction settings. Whereas the first frame of reference typically includes standardized, norm-based instru-

ments, the second frame of reference includes formal and informal assessment techniques across a wide variety of settings. To adequately achieve these diagnostic and prescriptive goals, a multidisciplinary team approach is typically used. This team can consist of, but is not limited to, a physician, a nurse, a psychologist, a speech pathologist, an educational specialist, a social worker, and occupational and physical therapists.

Assessment programs in most schools and clinics recognize the importance of acquiring information about an individual's medical, psychological, educational, and social characteristics, and this information is more efficiently obtained in a multidisciplinary arrangement. However, the efficiency of this process has been questioned in terms of the amount of information obtained and that used for making a diagnostic or treatment decision. Algozzine, Ysseldyke, and Hill (1982) found that decisions to classify a student as learning disabled, emotionally disturbed, or mentally retarded were unaffected by the number of scores used to make the decisions. Ysseldyke, Algozzine, Richey, and Graden (1982) studied multidisciplinary placement team meetings and found that 83% of the statements made were considered irrelevant to the decision ultimately made. Further, they noted little relationship existed between the nature and type of information presented and the final decision reached. These findings cast doubt on the cost-benefit ratio of using a multidisciplinary approach, given its current manner of functioning. Further, in designing an appropriate assessment strategy, Ysseldyke, Algozzine, Regan, Potter, Richey, and Thurlow (1980) noted that professionals used from 1 to 11 tests in arriving at decisions, and that, after the third instrument selected, the psychometric properties of the selected instruments tended to be inadequate.

Two other approaches to the assessment of learning disabilities merit comment, one being a modification of the traditional comprehensive approach, and the other being subsumed under the psychological evaluation component. The first approach is the System of Multicultural Pluralistic Assessment (SOMPA), which provides a comprehensive method for assessing and interpreting various characteristics typically seen as important for school success (Mercer & Lewis, 1978). The SOMPA is a system of tests developed primarily to assess children from culturally different backgrounds. Thus, it attempts to provide a culturally fair normative base for children with different cultural experiences. Children are examined with tests purporting to represent three models, including the medical model, a social system model, and a pluralistic model (i.e., having multiple normative groups for comparison purposes). This provides the advantage of studying a particular child from three distinct vantage points. Information collected from the eight SOMPA measures comes from the child and the parents; however, additional information, such as educational testing, is necessary to complete the evaluation. A child's performance is compared only with that of others from the same sociocultural background and scores are translated into an "estimated learning potential" (ELP), which is similar to a traditional IQ score. Although the SOMPA has been extensively criticized (Brown, 1979; Goodman, 1979; Oakland, 1979), it has provided the foundation for conceptualizing assessment strategies from a multidimensional perspective.

The second approach worthy of mention was once formally connected to the study of learning disabilities by the term *psychoneurology* (Johnson & Myklebust, 1967). Recently, however, this term has been changed to *neuropsychology*, which refers to the study of brain-behavior relationships. It is suggested that the neuropsychological examination is more complete and definitive in differentiating learning problems that are due to central nervous system dysfunction than separate neurological or traditional psychological evaluations (Hynd & Cohen, 1983). In the neuropsychological examination, neurological and psychological information are integrated to form a complete picture of the functioning of the neurological system as it relates to learning disorders (Hynd & Snow, 1986). A typical neuropsychological examination would look at the quantitative and qualitative features of an individual's performance across a wide variety of cognitive functions, including motor, sensation, perception, memory, symbolization, conceptualization, and organizational abilities (Obrzut, 1981).

Like other assessment approaches, the neuropsychological approach is not without problems surrounding the clinical utility, reliability, and validity of the available tools (particularly for children), as well as interpretive concerns for the younger child. However, such an approach is consistent with the hypothesized neurobiological basis of learning disabilities, and it has potential for contributing to the subtype analysis of this group of disorders (Rourke, 1985), especially as it relates to diagnosing the subtype, assisting in the early identification of learning disabilities, and providing the impetus for well-founded treatment interventions.

### *Prevalence Estimates*

Given the plethora of confusing terms and definitions, and varied assessment procedures, it is not surprising that prevalence estimates remain unclear. Based on survey data, Myklebust and Boshes (1969) estimated that approximately 15% of students in the public schools are underachievers. Of this 15%, about half appear to have learning deficits associated with neurobiological factors. More conservative prevalence estimates of learning disabilities have ranged from 1% to 3% (National Advisory Committee on Handicapped Children, 1968; Silverman & Metz, 1973; U.S. Office of Education, 1972) but have been based largely on the number of school-aged children receiving special services. Duane (1979) estimated that the population of children experiencing learning disabilities, particularly those with reading deficits, exceeds the combined populations of children who have seizure disorders, cerebral palsy, and severe mental retardation. Clinically, this estimate translates into an expected incidence rate of approximately 20–30 children in every 1,000 (Hynd, Obrzut, Hayes, & Becker, 1986). Thus, this an extremely important area for the educator, the physician, and the child psychologist.

As previously noted, the definitional issues that surround the concept of learning disability make any attempt at estimating its prevalence speculative, at best. However, meaningful attempts to estimate the prevalence of other disorders, such as specific reading and spelling retardation, have been generated.

Berger, Yule, and Rutter (1975) found that specific reading retardation is much more common in boys than in girls, with a ratio of about 3.5 to 1. Further, Rutter and Yule (1975) asserted that prevalence is increased in older children, primarily because reading-retarded children make less progress in reading than normal children and may also be affected by secondary emotional problems. Reports of specific reading retardation prevalence range from about 4% of Isle of Wight 10-year-olds to about 10% of London 10-year-olds (Berger *et al.*, 1975). Benton (1975) observed that dyslexia may be related to the neurolinguistic nature of the language, so that it appears more commonly in Scandinavia, the United States, and the British Isles and is less common in Italy, Spain, and Japan. Rutter (1978) cautioned, however, that these estimates are based on noncomparable data, and that no valid inferences are possible with respect to cultural variations at the present time.

Accurate prevalence and incidence rates also are currently difficult to derive because of problems related to the definition of learning disabilities. In addition, these estimates are more difficult to obtain for the learning-disabled population than for mental retardation because these children are less readily identifiable and less likely to be receiving special services (Oakland & Goldwater, 1979). However, arriving at accurate estimates remains important in determining the need for intervention services, training-school personnel, funding, policy formation, and legislation, and the establishment of adequate prevalence and incidence rates is critically wedded to the development of a widely accepted definition of learning disabilities.

## DIFFERENTIAL DIAGNOSIS OF MENTAL RETARDATION AND LEARNING DISABILITY

Historically, the concept of mental retardation laid the foundation for viewing all learning disorders. In particular, thinking regarding mental retardation contributed to evolving etiological, definitional, and treatment perspectives for learning disabilities. With recent advances in the fields of neuroanatomy, neurophysiology, and neuropsychology, support for conceptualizing these disorders from a neurological basis has emerged, and a neurological continuum of pathology between mental retardation and the varied specific learning disabilities has been proposed (Baumeister & MacLean, 1979). In addition, similarities between these two disorders can be found when reviewing respective etiological agents and presenting symptoms.

For example, both groups manifest deficiencies in academic achievement, information-processing problems, attentional deficits, uneven patterns of learning performance, and difficulties in social relationships. Further, both groups have a fairly high incidence of hyperactivity, an inability to modulate the motor behavior appropriate to a given situation (Grossman, 1983). However, whereas the hyperactivity of mentally retarded children usually takes the form of aggressive, destructive, unpredictable, and impulsive behavior (perhaps reflecting

their more extensive central nervous system pathology), learning-disabled children exhibit additional forms, such as aimless and clumsy, but placid, behavior and highly verbal, talkative, and somewhat immature behavior (Grossman, 1983). Based on these traits, as well as the other previously described behaviors, learning-disabled populations are not readily distinguishable from mentally retarded populations, particularly from the mildly retarded individual.

At this point, it is appropriate that we return to the question that Tylenda (1983) put to her undergraduate students and ask, "What differentiates mild mental retardation from a specific learning disability?" Stated in clinical terms the question is "How is a differential diagnosis made when mild mental retardation and learning disabilities are the variables under consideration?" Theoretically, the differences are not completely clear, but they can be resolved to some degree. Clinically, discrimination between these two groups of learning disorders are clear-cut at the extreme ends of the neurological continuum; however, as one moves toward the center of the continuum, diagnosis becomes less clear. It is this type of case, the one that demonstrates characteristics of both mental retardation and learning disability, that the clinician must consider on an individual basis for diagnosis.

Conceptually, three possibilities are under consideration when a differential of this type is proposed: (1) the individual is mentally retarded and not learning-disabled; (2) the individual is learning-disabled and not mentally retarded; and (3) the individual is mentally retarded *and* learning-disabled. Traditionally, the most discriminating characteristic between mental retardation and learning disability has been level of measured intelligence. If one considers the definition developed by the National Advisory Committee on Handicapped Children in 1968 and adopted by most state education departments (*Federal Register*, 1976), the term *learning disability* specifically excludes mental retardation and presumably includes children near, at, or above average intelligence (McCarthy, 1975). Therefore, by the customary interpretation of this definition of learning disability, if an individual is diagnosed as learning-disabled, he or she cannot be mentally retarded. However, the converse is possible. The definition of mental retardation (Grossman, 1977, 1983) does not have any comparable exclusionary features. Thus, by definition, a mentally retarded child or adolescent may be learning-disabled. Theoretically, it would appear that, on one hand, an individual cannot be simultaneously diagnosed as learning-disabled and mentally retarded, whereas, on the other hand, this is a viable possibility.

How does one make sense of such seemingly contradictory material? Considering these two definitions in conjunction, one can infer that if an individual were to be simultaneously diagnosed as mentally retarded and learning disabled, the two disorders would need to be addressed in terms of primary and secondary diagnoses. Logically, and consistent with the respective definitions, if mental retardation were the primary diagnosis, a specific learning disability could be secondary to it. If an individual carried a primary diagnosis of learning disability, in all probability he or she would not be mentally retarded as well. Interestingly, although no direct mention is made in any major textbooks regarding this interpretation, the DSM-III (American Psychiatric Association,



1980) supports this position in an explanation of a differential diagnosis under "Specific Developmental Disorders, Developmental Reading Disorder":

In Mental Retardation, reading difficulty is due to a general impairment in intellectual functioning. However, in some cases of Mild Mental Retardation, the reading level is significantly below the expected level, given the individual's schooling and level of retardation. In such cases the additional diagnosis of Developmental Reading Disorder should be made, since treatment of the reading difficulties can greatly increase occupational potential. (p. 94)

Further, the updated definition of learning disability offered by the National Joint Committee for Learning Disabilities (Hammill *et al.*, 1981) makes direct allowance for a learning disability to exist concurrently with mental retardation, although it fails to address issues of primary and secondary diagnostic considerations.

Overall, it appears that difficulties persist with the current definitions of mental retardation and learning disability (e.g., vagueness, ambiguity, exclusionary features, and apparent contradictions between and within major sources). Theoretically, however, a diagnostic perspective can be derived from the current definitions, and some cohesiveness can be abstracted, in that diagnoses of mental retardation and learning disability may coexist, but only when mental retardation is the primary diagnosis and only for individuals falling in the mild to moderate range of mental retardation.

What, then, is the clinical utility of a dual diagnosis of this type? First, from the perspective of a child's strengths and weaknesses, it would seem that a dual diagnosis would contribute to greater specificity in educational programming and instructional interventions. For example, a child with a specific language disorder and sufficient adaptive behavior, as compared to a child with general developmental delays in both language and adaptive behavior domains, would fit this diagnosis. Second, knowledge of a child's specific pattern of strengths and weaknesses could lead to differentiating vocational alternatives for a particular child. For example, a child with a specific academic or language disorder may have motor and nonverbal strengths that could be used in a particular vocational setting where verbal skills and reasoning are secondary to performance. Third, the dual diagnosis would lay the foundation for clinicians and other interventionists (e.g., teachers) to recognize this child as possibly more disordered than a child who is generally delayed across functional domains. The benefits of a dual diagnosis do not necessarily provide a distinct advantage to a thorough evaluation of a child leading to the sole diagnosis of mental retardation, and a dual diagnosis may lend itself to further stigmatizing the child by further involving him or her in the labeling process. However, from an ethical perspective, providing a dual diagnosis may contribute to generating thorough and higher quality special interventions than if the child is given the sole diagnosis of mental retardation. These questions still remain open to debate and empirical review.

In terms of the assessment of individuals suspected of having one or both of these learning disorders, there are no formal models. Nonetheless, by concep-

TABLE 3. A Comprehensive Structure for the Evaluation of Learning Disorders

- 
- I. Historical information
    - A. Medical
    - B. Developmental
    - C. Family
    - D. Academic
    - E. Social
  - II. Physical examination
    - A. General
    - B. Neurological
      - 1. Electroencephalographic technique (e.g., evoked potentials)
      - 2. Neuroimaging technique (e.g., magnetic resonance imaging)
    - C. Genetic analysis
    - D. Ophthalmological
    - E. Audiological
    - F. Laboratory tests
      - 1. Serological
      - 2. Urinalysis
      - 3. Hematological
    - G. Psychiatric
  - III. Psychological evaluation
    - A. Neuropsychological
    - B. Intellectual
    - C. Personality
    - D. Adaptive behaviors
  - IV. Language evaluation
    - A. Expressive (including articulation and voice examinations)
    - B. Receptive
    - C. Pragmatics
  - V. Educational evaluation
    - A. Formal measures (e.g., psychoeducational tests)
    - B. Informal measures
- 

tualizing these disorders on a neurological continuum, observed behaviors can be separated by *degree* of impairment. This conceptualization would support finding selected deficits, such as in the academic domain, in the learning-disabled individual and more generalized deficits, such as in cognitive functioning and adaptive behaviors, in the mentally retarded individual. A neurological continuum approach does not preclude the possibility of a severely learning-disabled individual's having more generalized dysfunction or a mentally retarded individual's having additional specific deficits; however, it does suggest that a thorough evaluation of all functional areas is warranted in arriving at a differential diagnosis. Table 3 presents a comprehensive structure for the evaluation of all learning disorders. It is recognized that all of these assessment domains are not necessary, nor will they always be clinically feasible in arriving at a differential diagnosis between mental retardation and learning disability. Nonetheless, each of them should be considered in planning an assessment strategy, particularly when one is faced with an individual manifesting behaviors charac-

terizing both groups of learning disorders. The astute clinician will thoroughly evaluate an individual's behavior and will arrive at a profile of strengths and weaknesses that will implicate etiological, diagnostic, and treatment factors.

## SUMMARY

This chapter has reviewed the differential aspects of two major categories of learning disorders: mild mental retardation and specific learning disability. Historical overviews of both diagnoses have been provided, as well as information on etiology, prevalence, and guidelines for assessment. A major emphasis within the chapter is placed on definitional issues related to each disorder and on addressing the clinical utility of concurrent diagnoses (i.e., mild mental retardation with concomitant learning disability).

It is noted that the concept of mental retardation has a long, if not always distinguished, history as a diagnostic entity and has served as the principal force behind the study of learning disability. A great deal of similarity is observed to exist between conceptualizations of each disorder. Whereas, both mental retardation and specific learning disability were once thought of as largely cultural-familial in origin, current etiological perspectives advance the notion of neuropathology as pervasive within both diagnostic categories. At present, all mental retardation is viewed as existing along a continuum of neurological impairment (cf. Baumeister & McLean, 1979), with both essential impairment (i.e., brain damage) and degree of impairment (i.e., level of intellectual handicap) dictated by a three-factor transactional model of genetic factors, intrauterine and neonatal physical risks, and social influences. Over 200 known causes of mental retardation exist (Cleland, 1983) and may be explained by this model. Learning disability is similarly viewed as determined through a combination of genetic, physical, and environmental events (Wong, 1979); however, the resultant neurodevelopmental disorder is substantially different from mental retardation in that it presents with a circumscribed and focused pattern of impairment and lacks any identifiable etiological mechanism.

Differential determinations of mild mental retardation and specific learning disability are, of course, directly related to the establishing of pertinent diagnostic criteria, which, in turn, serve to define each disorder as a distinct entity. Issues regarding definition abound in discussions of both categories. However, it appears that the long history of study related to mental retardation has resulted in the advantage of a stable definition of the general disorder, as well as in a classification of subtypes within the disorder. Although several revisions of the mental retardation definition have occurred since the early 1970s (Grossman, 1973, 1977, 1983), such revisions have been aimed at further diagnostic precision through using psychometrically derived criteria and attaining consistency across agencies (e.g., the American Association on Mental Deficiency, the American Psychiatric Association, and the World Health Organization) serving the mentally retarded population. The basic definition of mental retardation (signifi-

cantly subaverage intellectual functioning, concurrent deficits in adaptive behavior, and age of onset before 18 years) has not been affected by revision.

By contrast, the basic definition of learning disability has been far less stable. A half-dozen or more diagnostic labels have been offered to describe it (Spears & Weber, 1974), and a dozen separate definitions have sought to operationalize its content (e.g., Algozzine & Ysseldyke, 1983; American Psychiatric Association, 1968, 1980; Hamill *et al.*, 1981; Kirk & Bateman, 1962; McCarthy, 1975; NACHC, 1968). It has, at once, been regarded as mutually exclusive with a diagnosis of mental retardation and as possibly existing concomitantly with mental retardation. To date, no clear definition of specific learning disability has emerged, and the delineation of subtype classification has been limited only by the sophistication of the assessment measures employed (Hynd, Obrzut, Hayes, & Becker, 1986).

Prevalence data and assessment methodology are additional areas in which the long history of study related to mental retardation has allowed an advantage to accrue in gaining a more thorough understanding of the disorder relative to what is known about specific learning disability. Whereas for mental retardation prevalence estimates have been consistently reported at 1% (e.g., American Psychiatric Association 1980; Tarjan, 1970) and guidelines for assessment have been well standardized through the use of individually administered intelligence tests and adaptive behavior inventories, prevalence estimates of specific learning disability fluctuate between 1% and 7% because of the lack of an authoritative definition, and the development of a standardized assessment battery is yet to be achieved.

Despite difficulties in establishing etiological mechanisms, definitions, prevalence patterns, and guidelines for the standardized assessment of specific learning disability, a clinically valid diagnosis different from mild mental retardation appears possible. Three possibilities must be considered when a differential of this type is proposed: (1) the individual is mentally retarded and not learning-disabled; (2) the individual is learning-disabled and not mentally retarded; and (3) the individual is both mentally retarded and learning-disabled.

In the first two cases, the differential is likely to be clear-cut. In the first case, the individual meets criteria for mental retardation with all deficits in learning and development adequately explained by type and degree of intellectual, physical, and sensorial handicap. In the second case, the individual does not meet the criteria for mental retardation and presents with specific deficits in learning and development that, in the absence of physical and sensorial handicap, are not adequately explained by general intellectual ability. In the third case, where the individual is determined to be both mentally retarded and learning disabled, the differential is less clear, and the possibility of concurrent diagnoses must be entertained. In such cases, the individual meets the criteria for mental retardation and therefore is primarily diagnosed as such. However, if a specific learning or developmental disorder is observed to exceed that which may be adequately explained by the type and the degree of intellectual, physical, and sensorial handicap, a concomitant or secondary diagnosis in the area of the specific learning disability should be made.

In conclusion, it was noted that diagnostic classification in the area of mental retardation would appear to benefit from the development and application of psychometrically derived criteria for the assessment of adaptive behavior. Research within the field of specific learning disability should focus on the development and acceptance of a consensual definition of the disorder and its many subtypes. Additionally, the need to further refine existing neuropsychological evaluation techniques is evident.

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# 10      *Severe Developmental Disabilities*

HELEN EVANS AND ELIEZER SCHWARTZ

## INTRODUCTION

In his "Presidential Address of 1984," presented to the readers of the journal *Mental Retardation*, H. J. Grossman stated:

Mental Retardation is a clinical term used to describe certain clinical manifestations which can be assessed clinically. Developmental disabilities, on the other hand, is not a clinical term. It includes individuals who have a variety of physical and clinical disorders, each with different implications for clinical care, education, and program planning. (p. 3)

The developmentally disabled children considered in this chapter constitute not only a heterogeneous clinical population (with a multiplicity of clinical and physical disorders), but also a group of children with poverty of prognosis for future independent survival. The only common denominator for this group of children is the early onset of a severe developmental lag in most cognitive and functional areas.

Severely developmentally disabled children usually suffer from multiple deficiencies (physical, neurological, and emotional). Diagnostically, these children are labeled as severely or profoundly mentally retarded and/or severely multiply handicapped. Characteristically, the older severely disabled child is so limited in the capacity to communicate needs and to interact socially, that a formal assessment of intelligence is usually not possible (Ellis, *et al.*, 1982; Morganstern, 1983). In addition, the majority of these children suffer from a very early onset of a number of physical or adaptive deficits that contaminate differential diagnostic efforts to determine etiological factors and the prognosis for developmental gains.

The most profoundly disabled child requires and will require constant assistance for and surveillance of both his or her medical problems and his or her daily survival capabilities. When not bedridden, and when without debilitating physical and perceptual handicaps, severely mentally retarded children can be

trained for limited mastery and independence of basic adaptive behaviors (toileting, dressing, feeding, helping with household chores, and communicating basic needs). Later in life, they are capable of living in sheltered residential facilities and are trainable for participating in sheltered daily programs offering social and vocational tasks (Irvin, Gersten, & Heiry, 1984).

## DEFINITION AND CLASSIFICATION

According to the American Association of Mental Deficiency (AAMD; Grossman, 1973), *mental retardation* is a descriptive term that refers to significantly below-average intellectual functioning, existing along with major deficits in adaptive behavior occurring during the developmental period. Intellectual functioning is defined by performance on standardized tests such as the Stanford-Binet Intelligence Scale or the Wechsler Intelligence Scale for Children (Wechsler, 1967, 1974). Adaptive behavior consists of the degree to which an individual has a level of personal independence and social responsibility appropriate for his or her age and cultural group. Usually, adaptive behavior is assessed with a scale such as the AAMD Adaptive Behavior Scale, along with behavioral observations. The definition of mental retardation specifies that the below-average intellectual and adaptive behavior functioning occur during the developmental period (i.e., before age 18) in order to distinguish mental retardation from other disorders occurring in the adult years and affecting intellectual functioning and adaptive behavior.

The criteria for the AAMD classification of severe mental retardation includes being 4–5 standard deviations below the mean score on an intelligence test and having a correspondingly low adaptive behavior level. The adaptive behavior at the preschool level is likely to include limited motoric development, minimal speech, and a lack of self-care skills, such as toilet training. During the school-age period, if the child is trained, her or his adaptive behavior may increase to consist of some speech and other communication methods, some self-care skills, simple health habits, and very simple leisure skills (Sattler, 1982). Most profoundly mentally retarded preschool children's adaptive behavior is impaired in the areas of sensorimotor functioning and communication. During the school years, these children may develop some minimal communication and motoric skills. With intensive training, they may learn a few self-care skills. However, these individuals usually require a great deal of care and supervision in a very structured living arrangement.

The third edition of the *Diagnostic and Statistical Manual (DSM-III)* of the American Psychiatric Association (1980) defines severe and profound mental retardation in a manner similar to that of the AAMD. Intellectual functioning as measured on intelligence tests is respectively defined as severe and profound mental retardation with IQ levels of 20–34 and below 20. Adaptive behavior levels are similar to the AAMD levels.

## FIRST INDICATORS OF DISABILITY: PRELIMINARY SCREENING

The multiplicity of etiological factors in developmental disabilities (prenatal, perinatal, and postnatal) has been well documented by a number of writers (e.g., Baroff, 1974; Koch & Dobson, 1976; Robinson & Robinson, 1976). In some conditions (e.g., hypothyroidism), early diagnosis can help to reverse the condition. In other conditions (e.g., hydrocephaly), surgical corrections can help. Early diagnosis is crucial to differentiation between high- and low-risk children (Kavaggia, Durkin, Pendleton, & Ortiz, 1973) after allowing for the prevention of death or future serious disabilities.

There is no known medical treatment for some genetically induced defects (e.g., Down's syndrome). However, many untreatable conditions have implications for the family. Consideration of hereditary transmission (e.g., neurofibromatosis) and nonhereditary transmission (e.g., congenital syphilis) is extremely important. In addition, the implications for the child include the early onset of remedial efforts to lessen the severity of developmental lags, as well as early psychological intervention and training of family members to cope with a severely disabled child.

Therefore, early and accurate diagnosis is essential, not only for long-term treatment of the child, but also for the prevention of severe medical and psychological consequences to the child or to family members.

### *Prenatal Indicators*

The prenatal causes of mental retardation and other handicapping conditions include genetic and nongenetic insults to the fetus *in utero*: chromosomal abnormalities, metabolic diseases, infections, intoxications, physical trauma, and unknown influences. There is a growing body of knowledge and sophistication of technology in describing and following fetal conditions and thus an increased capacity to identify pathological conditions of and risk factors for the fetus.

Embryologists already speculate in terms of "fetal competence" in their pursuit of and research on prenatal influences on the adaptive capacity of the newborn (Barrett, 1982). Consequently, documented information on maternal health during pregnancy, fetal distress, and laboratory results (e.g., amniocentesis and X rays) are valuable resources that indicate possible retardation or handicapping conditions.

### *Perinatal Indicators*

Maternal toxemia, maternal health status, physical trauma and hypoxia related to the process of birth, and other obstetrical complications are significant medical information. Their early identification is crucial in the assessment of risk factors and possible future developmental disabilities. Results from neonatal medical and neurological examinations (e.g., premature birth, weight at birth,

Apgar scores, EEG, and CAT-scan studies) become more and more reliable and valid predictors of future complications (Prechtl, 1982).

### *Postnatal Indicators*

Early onset of mental retardation and developmental delays can result from postnatal injuries and complications. Traumas, intoxications, infections, new growth, metabolic disorders, malnutrition, and psychological damage are all recognized as etiological factors (Chaney & Eyman, 1982). Therefore, in addition to medical and neurological data, observations of the child and the child's interaction with the environment can provide valuable diagnostic material on the developmental and adaptive capacity of the child.

### *Preliminary Screening*

The initial clinical attempt to diagnose the possibility of a severe developmentally disabling condition is based on an appreciation of multisourced information.

### *Interviews with Parents and Other Family Members*

In most cases, parents and family members have some knowledge (mostly from physicians) of some risk factor for or insult to the child. A thorough interview, however, can help the clinician to identify the basis for parental concerns about suspected pathological development of the child. The capacity of the interviewer to differentiate between a parental reaction to medical-neurological diagnoses and parental concerns based on their own observations is crucial. The differentiation will dictate to the interviewer the necessary following steps to be taken in the screening process.

### *Review of Medical-Neurological Information*

Documented prenatal, perinatal, and postnatal information from physicians provides the clinician with the background knowledge needed to assess the prognostic value of the following variables:

1. The medical prognosis for future rate in development, and expectations of possible physical complications. The degree of clarity and the confidence of the physicians in their diagnosis has ramifications for continuous medical efforts toward diagnosis, prevention, and/or treatment.

2. The degree of the parents' comprehension and the trust of the parents in the information provided by physicians, allowing the clinician to assess the emotional reaction and adjustment capacity of the parents to the birth of a disabled child. High levels of parental insight, motivation, and coping skills are crucial to an appreciation of the multiplicity of services to be considered in attempts to answer both the needs of the child and the needs of the family.

Blacher (1984a) reviewed and critiqued a large body of literature on parental reaction and adjustment capacity to the birth of a mentally retarded child. She concluded her overview by pointing out the heuristic value to the understanding of parental adjustment of "practical programming and placement decisions" for the handicapped child.

3. Finally, the number and the complexity of identified physical complications alert the clinician to the multidisciplinary nature of future diagnostic and intervention efforts with the child and the family (medicine, psychology, speech pathology, physical therapy, occupational therapy, and other social services).

### *Observations of Parent-Child Interactions*

For the last several years, those who publish child development literature have aggressively promoted the hypothesis that emotional attachment (bonding) between parent and child is a necessary precondition of future healthy adjustment in life. Research on this phenomenon had often focused on the child's attachment reactions to the mother (Ainsworth, 1973). However, there is a growing opinion that attachment is a mutually adaptive behavior system in the service of both the child's and the parent's needs (Bowlby, 1980; Srouffe & Waters, 1977). Consequently, this behavioral reciprocity can be observed and measured in its developmental unfolding. The involved parent reacts both to the child and to the child's recognition of this reaction. The expected cues from the child reinforce parents' further interventions (Hinde, 1982).

The severely disabled child, who fails to provide the expected cues of attachment (e.g., smile, turning of the head, looks, and body movements), forces the parent to make compensatory efforts to "arouse" the child (e.g., raising the voice, shaking the child, and exaggerating tonal changes). These compensatory efforts (Fraiberg, 1974; Jones, 1979; Wedell-Monnig & Lumley, 1980) are observable reactions and suggest the possibility of developing systematized behavioral observations to detect developmental delays.

### *Observations of the Child*

By definition, a preliminary screening excludes the use of standardized assessment procedures. In addition, a preliminary screening indicates the need for a relatively informal and quick process of impressionistic conceptualization of a diagnostic question. Observations of a severely developmentally disabled child can provide the clinician with sufficient information to allow for an educated diagnostic impression of possible developmental and adaptive deficiencies. These preliminary observations can be done in one of two ways:

*Informal Interaction and Observations of Child's Free Play.* Knowledge of developmentally age-appropriate tasks and skills, as well as experience working with and evaluating children, can provide the clinician with the necessary sensitivity and acuity of observation to detect deviant reactions of a child to toys, strangers, or attempts at sound interaction. Observations of the child's physique, mobility,

level of activity, communication capacity, and reactions to a range of stimuli are compared with age-appropriate expectations, leading toward diagnostic impressions.

Many experienced clinicians working with handicapped and young children develop their own "informal kit" of toys (e.g., strings, beads, small plastic containers, crayons, and paper) to facilitate an interaction with or reactions from the child. Such a preliminary investigation can be based on the systematic use of a few selected items or tasks from formalized assessment procedures such as the Bayley Scales of Infant Development.

*Structured Reflex Testing.* In many instances, developmental disabilities are the result of or are accompanied by a variety of neurological dysfunctions. The current knowledge on the maturation of the central nervous system (CNS) indicates that normal and abnormal reflex responses during the first year of life are not only a manifestation of motor development, but also a partial manifestation of the maturation and integrity of the systemic function of the CNS. The research and clinical work of Bobath (1971) and Bobath and Bobath (1975) provided a rationale and a methodology for the diagnosis and treatment of physically handicapped children and adults. This methodology is, in particular, sensitive to disabilities involving a variety of movement and posture deficits.

Normal motoric maturation follows a pattern of progressive inhibition of primitive reflexes by higher and more integrated patterns of motoric reactions. The prone or supine infant is dominated by *primitive reflexes* mediated by the spinal cord and the brain stem. Later, the child can turn over, crawl, or sit, the result of *righting reactions*, a group of movement patterns mediated at the mid-brain level. The child's capacity to elevate the body to a bipedal level (standing and walking) is brought by *equilibrium reactions*, which are mediated by the synergetic interaction of the cortex with the basal ganglia and cerebellum. This sequential development, and its expected chronology in the first years of life, allows for a structured and systematic evaluation of prerequisites for motoric capabilities and partial inferences on neurological integrity (Fiorentino, 1963, 1972).

Reflex testing methods were used widely and for many years, by physical, occupational, and speech therapists. Recently, child neuropsychologists added these methods to their diagnostic and screening techniques. A few examples of reflexes will be presented to illustrate the methodology involved in reflex testing (Fiorentino, 1963, 1972). The presence or absence of a reflex is determined by bodily responses of the child to a particular position and/or stimulation determined by the examiner. The reflexes are expected to be normal within certain age limits, and considered to be abnormal beyond these limits. The examiner is expected to appreciate that normal development is variable from one child to another, and *age levels* are understood as *approximate*.

Example A: *Flexor withdrawal*, a spinal reflex

Position: Child is supine, with head in a midposition and legs extended.

Stimulus: Examiner stimulates sole of foot.

Positive reaction: Stimulated leg reacts with an uncontrolled flexion.



- Negative reaction: Stimulated leg maintains a controlled extension, or withdraws volitionally from the irritating or tickling stimulus.
- Notes: Spinal reflexes dominate completely the prone and supine-lying child. During the first 2 months of life, their presence *or* absence is normal. Their presence beyond the age of 2 months *may* indicate delayed maturation.
- Example B: *Associated reactions*, a brain stem reflex
- Position: Supine, head in midposition, limbs extended.
- Stimulus: Child squeezes object.
- Positive reaction: Opposite hand mirrors the squeezing, and/or there is an increase in muscle tone in other parts of the body.
- Negative reaction: No reaction or minimal contralateral increase in muscle tone.
- Notes: Brain stem reflexes dominate completely the prone and supine child and are related to muscle tonicity throughout the body. During the first 4–6 months of life, their presence *or* absence is normal. Persistence of these reflexes beyond the age of 6 months *may* indicate delayed maturation.
- Example C: *Neck righting*, a righting (midbrain) reaction
- Position: Supine, head in midposition, limbs extended.
- Stimulus: Gentle active rotation of head to one side.
- Positive reaction: Entire body rotates as a whole in the same direction in which the head was rotated.
- Negative reaction: Body does not rotate.
- Notes: Righting reactions dominate the normal relationship to space in the quadrupedal child (rolls over, sits up, and crawls on all fours). Positive neck righting reaction is normal from birth to 6 months of age. Its presence after this age *may* indicate delayed maturation.
- Example D: *Dorsiflexion*, an equilibrium reaction
- Position: Child in standing position.
- Stimulus: Examiner holds child under the arms and tilts him or her backward.
- Positive reaction: Head and thorax right themselves, and feet dorsiflex (toes go up, and child is on the heels).
- Negative reaction: No righting of head and thorax and no dorsiflexion of feet.
- Notes: Equilibrium reactions dominate the bipedal human. They follow normalized muscle tone and allow body to adapt in reaction to changes in the center of gravity of the body. Their onset can be observed from

the age of 6 months and continue throughout life. Dorsiflexion observed at 15–18 months of age is expected. Negative reaction after the age of 18 months *may* indicate delayed reflexive maturation.

Testing for reflexes can be a valuable addition to the screening process because of its simplicity (no need for special instruments or assessment tools) and its capacity to provide much information in a short time. In addition, the results of such an assessment are easily communicated to parents and other professionals. Evaluators adopting reflex-testing techniques are cautioned not to translate the possible delay of reflexive maturation in terms of cognitive-intellectual deficiencies. In addition, evaluators should develop their skills under supervision so that they are well enough trained to avoid possible harm to or infliction of pain on the child while positioning and stimulating the body.

## INTELLECTUAL ASSESSMENT

One of the major factors in the diagnosis of mental retardation is intellectual functioning according to the DSM-III (1980) and the AAMD (Grossman, 1973) definitions of mental retardation. Thus, intelligence tests are frequently the major tool used to classify children for special training programs (Berkson & Landesman-Dwyer, 1977). Most assessments for special vocational and educational purposes require an in-depth evaluation with one of the individually administered intelligence tests. However, the passage of Public Law 94-142 in 1975 has resulted in the more frequent use of more brief screening devices as an initial step in the evaluation or as a reevaluation.

### *Slosson Intelligence Test*

One of the more frequently used screening devices is the Slosson Intelligence Test (Slosson, 1963). The Slosson Intelligence Test may be administered to a child by a trained educator or psychologist. This test has an age range of .5–27 years. There are several items at the different age levels. Some items are adapted from the Stanford-Binet Intelligence Scale and the Gesell Institute of Child Development Behavioral Inventory (Sattler, 1982).

The Slosson test items are administered without time limits. As this is a brief test, the range of skills and items is limited. After age 2, the items focus on evaluating verbal more than nonverbal skills. All the items beyond age 4 require the child to be verbal. The scoring of the Slosson Intelligence Test yields a ratio IQ with varying standard deviations at different ages. The manual does not provide adequate information regarding the standardization group. Slosson (1963) found a test–retest reliability of .97 for persons aged 4–50 years when retesting occurs within two months. Rotatori and Epstein (1978) reported test–retest reliabilities ranging from .91 to .96 for a group of severely and profoundly mentally retarded children who were retested by trained educators. Although the Slosson Intelligence Test seems reliable with severely and profoundly men-

tally retarded children, its validity as an intelligence test is somewhat questionable.

Comparisons of mentally retarded persons' Stanford-Binet and Slosson scores have resulted in correlations ranging from .60 to .91 (Carlisle, Shinedling, & Weaver, 1970; Rotatori, Sedlak, Freagon, 1979; Stewart & Meyers, 1974). Rotatori, Sedlak, and Freagon (1979) evaluated the relationship between Stanford-Binet and Slosson scores of only severely and profoundly mentally retarded children. Most of these children obtained higher IQs on the Slosson. However, the Slosson and Stanford-Binet raw scores correlated .90. Yet, these authors cautioned against viewing the Slosson Intelligence Test as an adequate instrument for assessing intellectual functioning because of the skewness of their distribution and the similarity of test items. The Slosson Intelligence Test seems most valid for screening purposes.

### *The Stanford-Binet and Wechsler Intelligence Scales*

The individually administered intelligence tests (Terman & Merrill, 1960; Wechsler, 1967, 1974) are often part of an in-depth evaluation of the severely and profoundly mentally retarded person. Although they are valuable in identifying deficits, these tests are limited as a method of assessing the existing cognitive functions of children with these more severe disorders. Many individuals are untestable with the standard intelligence-test procedures (Ellis *et al.*, 1982; Morganstern, 1983). Ellis *et al.* (1982) provided evidence on severely and profoundly mentally retarded adults that suggests that there may be wide variations in learning and retention on simple discrimination tasks by persons performing within the more severe ranges of intellectual functioning on individually administered intelligence tests. This research distinguished a high (IQ = 12.1,  $SD = 4.3$ ) and a low (IQ = 8.0,  $SD = 3.1$ ) profoundly mentally retarded group. One subject within the low profound group seemed to grasp the task as well as the moderately mentally retarded group. A few subjects performing within the severe and moderate mental retardation range on the intellectual tests failed to learn the discrimination task. However, in general, a greater percentage learned the task in the moderately and severely mentally retarded groups than in the profoundly mentally retarded group. Even though there is variation in learning within the severely and profoundly mentally retarded groups, the individually administered intelligence tests are effective as one of the factors in making some evaluation of learning and retention abilities.

The Stanford-Binet Intelligence Scale, Form L-M, revised (Thorndike, 1973) is an individually administered intelligence test that usually allows one to identify a mental age and an intellectual quotient at a level that fits within the AAMD criteria (Grossman, 1973) for severe and profound mental retardation. The Stanford-Binet measures general intelligence by having the examiner administer items that assess the areas of language, memory, conceptual thinking, reasoning, visual-motor skills, and social intelligence (Sattler, 1982). At the younger ages (below 5 years), the items are mainly ones requiring visual-motor skills rather than verbal and abstract reasoning (Morganstern, 1983). This emphasis on

visual-motor skills often allows the examiner to establish an IQ for severely and profoundly mentally retarded children. In addition, the assessment provides some information on the degree of the visual-motor, memory, and social-intelligence abilities available to the severely disordered child for learning simple academic and adaptive tasks. The Stanford-Binet should be viewed as an initial screening method, as it is unlikely to provide as much relevant information concerning the child's abilities as the developmental and adaptive behavior scales.

Few studies have focused on the reliability and validity of the Stanford-Binet scales in their use with severely and profoundly mentally retarded children. The information available in the manual (Thorndike, 1973) indicates test-retest reliability coefficients of .90 for the Stanford-Binet Intelligence Scale, Form L-M. Earlier reliability coefficients indicated that there was greater reliability on the two forms of the test at the lower than the higher levels of IQ (McNemar, 1942). The 1960 revisions of the Stanford-Binet (Terman & Merrill, 1960) combined items from these two forms, and the reliability of the revised scale was based on high levels of biserial correlations of the subtests. The norms of the Stanford-Binet Form L-M were revised in 1972. This sample included more lower-functioning children.

In addition to having norms for low IQs, the Stanford-Binet Intelligence Scale has been shown to correlate with the learning rate (Ellis *et al.*, 1982) and the receptive language abilities (Wells & Pedrini, 1967) of the severely and profoundly mentally retarded. Unfortunately, Ellis *et al.* (1982) did not specify how much the Stanford-Binet correlates statistically with the learning of a discrimination task. The Stanford-Binet scale is only one of several tests used in this study to classify subjects as severely and profoundly mentally retarded.

### *Leiter International Performance Scale*

Often, the assessment of the severely and profoundly mentally retarded may be expanded by including some individually administered tests that rely less on verbal instructions to and verbal responses of the child. The Leiter International Performance Scale (Leiter, 1969) is an evaluation tool for assessing general intellectual functioning where the examiner gives instructions with gestures and pantomime. The child is required to select a wooden block with a picture or symbol on it that fits with the design on a cardboard strip presented by the examiner. Most of the items are untimed. The Leiter includes tasks of matching colors and shades, reconstructing block designs, and arranging items in logical sequences. The tasks seem to emphasize perceptual organization and discrimination skills (Sattler, 1982). The Leiter International Performance Scale has tests for ages 2-18. As in the Stanford-Binet scales, there are several tests at each age level.

In the administration of the Leiter International Performance Scale, it is necessary to establish basal and ceiling levels. The ceiling level is defined as the point where all tests at two consecutive age levels are failed. The original standardization of the Leiter was done with a small population of Hawaiian children

of Japanese and Chinese origin and a group of children from the other states of the United States (Leiter, 1948). A difference in mean IQs was found in the two groups. The 1969 revision of the Leiter was an attempt to increase the normative population. However, the manual does not adequately describe the standardization sample and the reliability data. Unlike other intelligence scales, the Leiter yields a mental age and a ratio IQ. Research on the Leiter has shown satisfactory test-retest reliabilities (Sattler, 1982). In terms of validity, the Leiter has been shown to correlate fairly well with the Stanford-Binet and with the Wechsler Intelligence Scale for Children (WISC). It correlates more closely with the WISC Performance than with the Verbal scale. Occasionally, researchers have found large differences between the Leiter and the Stanford-Binet or the WISC Performance Scale IQs (Bonham, 1974; Sattler, 1982). Despite the standardization, reliability, and validity problems, the Leiter International Performance Scale is helpful when assessing a multiply handicapped severely or profoundly mentally retarded child. The nonverbal, hearing-impaired, and motorically handicapped child should be able to respond to the Leiter. Also, the test may help to differentiate the severely mentally retarded from the hearing-impaired and the physically impaired, as only the mentally retarded child would be expected to perform at least 3 standard deviations below the mean in IQ.

### *Peabody Picture Vocabulary Scale*

The revised Peabody Picture Vocabulary Test (PPVT-R) is a useful adjunct to the more generalized intelligence tests when evaluating children with severe mental retardation disorders (Dunn & Dunn, 1981). From the PPVT-R, one is able to get an assessment of the child's receptive language and visual comprehension (Sattler, 1982). The PPVT-R consists of four pictures on each of 175 plates. There are two forms of the PPVT-R, referred to as *L* and *M*. The examiner pronounces a word, and the child is asked to indicate the picture that best fits the word. When children have a motoric handicap, the examiner may point to each picture and have the child indicate the correct one by some prearranged method. The PPVT-R assesses ages 2½ years through adulthood. The scoring yields a standard score; the range of scores is 40–160, with a mean of 100 and a standard deviation of 15.

The available reliability data vary with age groups (Dunn & Dunn, 1981). On Form *L*, the PPVT-R's median split-half reliability is  $r = .80$  for ages 2½–18 years. On Form *M*, the PPVT-R's median split-half reliability is  $r = .81$ . Previous studies with the PPVT indicated high stability of scores for the mentally retarded (Dunn & Dunn, 1981; Sattler, 1982). A validity study of the PPVT showed a correlation of  $r = .72$  with the Stanford-Binet scale in a population that included the severely mentally retarded (IQs ranged from 24 to 69 on the Stanford-Binet; Wells & Pedrini, 1967).

Some severely and profoundly mentally retarded children may not score within the standard score range on the PPVT-R. However, the information from the assessment may have utility when planning education and rehabilitation training. Also, it may serve as a screening device to differentiate the physically

handicapped and nonverbal child from the mentally retarded or multiply handicapped mentally retarded child.

When attempting to assess the intellectual functioning of a severely or profoundly mentally retarded child, the evaluator is often faced with a situation that yields no test results under standard administration procedures (Berkson & Landesman-Dwyer, 1977). In these situations, it seems logical to consider modifying the testing procedures in order to get some information concerning the child's intellectual functioning (Morganstern, 1983). These modifications may include getting the child to cooperate by using rewards and providing extra time to complete tasks. The psychologist may gain information by creating methods to provide extra cues to answers. Clinically useful information is obtained from testing the limits of a child's learning. These methods may produce information for planning training programs for the child.

## DEVELOPMENTAL SCALES AND ASSESSMENT OF ADAPTIVE BEHAVIORS

The inability of intellectual assessment tools to provide adequate data on the programmatic needs of severely disabled children, as well as the growing need to assess and predict the adaptive capacity of these children, has demanded the application of diagnostic procedures that focus on developmental lags. In addition, the value of direct observations of behavioral deficiencies reinforces the use of developmental scales.

Traditional psychometric tests and the available developmental scales allow for a comparison of disabled children with a healthy, normative population (e.g., Bayley, 1969; Cattell, 1940). Piagetian-based scales (e.g., Uzgiris & Hunt, 1975) and assessment of adaptive behaviors (e.g., Fogelman, 1975) provide a more in-depth analysis of clusters and categories of behavioral skills, the primary focus of intervention with severely disabled children. Research and clinical experience with these diagnostic processes has stimulated the development of new scales, sensitive to the intervention needs of disabled children.

### *Traditional Developmental Scales*

In assessing the infant's and the young child's development, the Bayley Scales of Infant Development (Bayley, 1969) can provide information concerning the child's development of cognitive, sensorimotor, and social skills. The Bayley is a scale that is administered directly to the child. It provides more information for rehabilitation planning by professionals working with the severely or profoundly mentally retarded young child or infant than do intellectual assessments (Goldman, L'Engle-Stein, & Guerry, 1983).

The Bayley Scales of Infant Development are designed for use with children from 2 to 30 months old (Bayley, 1969). There are three sections to the Bayley (Mental Scale, Motor Scale, and Infant Behavior Record). The Mental Scale contains 163 items concerning activities and mental processes such as attention,

shape discrimination, imitation, vocalization, memory, acquisition of object constancy, problem solving, and naming objects (Goldman *et al.*, 1983; Sattler, 1982). The Motor Scale includes 81 items related to fine and gross motor activities, such as reaching, grasping, walking, hopping, and sitting. The Motor and Mental Scales contain items that are directly administered to the child. The Infant Behavior Report is completed after the child is evaluated because it is a systematic way of summarizing behavioral observations of the infant's social orientation, cooperativeness, fearfulness, tension, general emotional tone, goal directs, attention span, and activity level during the testing session. Because of the way in which items are arranged on the Bayley, it initially requires considerable practice to become proficient in its administration.

The Bayley scales were standardized on a sample representative of the U.S. population of infants 2–30 months at the time of the test's construction. The normative group did not include a representative sample of mentally retarded persons. The Mental Scale yielded a mental index that is a standard score, with a mean of 100 and a standard deviation of 16. The Motor Scale is also designed to result in a similar type of standard score.

On the Bayley Mental Scale (Bayley, 1969), the split-half reliability coefficients range from .81 to .93, with a median of .88. On the Motor Scale, the split-half reliabilities range from .68 to .92, with a median of .84. Reliabilities tend to be lower on the Motor Scale for the ages 2–5 months.

In terms of validity, the Bayley manual reports correlations between the Mental Development Index and the Stanford-Binet IQ ranging from .47 to .64. Vanderveer and Schwied (1974) found that 73% of a group of infants diagnosed as moderately to profoundly mentally retarded at 30 months or less (mean = 29.2 months) were still performing within the same range of mental retardation when reevaluated 12 months or more later (mean test–retest interval = 21 months; range = 12–39 months). About half the retests were with the Bayley Scale, and the others were evaluated with the 1960 revision of the Stanford-Binet Intelligence Scale (Terman & Merrill, 1960). These data suggest some predictive validity for the Bayley scales. The authors suggested that the stability of scores within the lower levels of mental retardation may mean that these children's mental conditions are resistive to change by social and educational interventions. Despite the results of Vanderveer and Schweid (1974), the primary purpose of the Bayley scales is to describe the child's present development and to identify areas of developmental lags (Bayley, 1969). These developmental lags usually become the focal points of a rehabilitation plan.

There are several other individually administered scales that may be useful in assessing the assets and deficits of a developmentally delayed child. *Cattell's Infant Intelligence Scale* (Cattell, 1940), which is similar to the Bayley scales, contains 96 items and 30 alternative items to assess infants from 2 to 39 months of age. The lack of inclusion of motor behaviors makes Cattell's Infant Intelligence Scale less valuable for assessing severely and profoundly mentally retarded children because, at younger ages, their delays in motor development may be a critical factor in showing their level of mental retardation and the areas potentially needing rehabilitation. Items on the Cattell are rated, similarly to Bayley scale

items, at a higher age range. Thus, the Cattell may give an inflated estimate of the child's cognitive functioning. The norms for the Cattell are somewhat limited for use with severely mentally retarded children because they were based on a small sample ( $N = 274$ ) of children who were born by normal delivery, whose fathers were employed, and who came from northern European stock. The split-half reliability of the Cattell varies considerably with age level (e.g.,  $r = .56$  at 3 months, and  $r = .90$  at 18 months). In general, Cattell's Infant Intelligence Scale compares favorably with the Bayley scale in terms of reliability. However, the Cattell, unlike the Bayley scale, does not provide as clear a profile of the infant's development.

Several infant and preschool scales have been developed as initial screening devices (Burgess, Asher, Doucet, Reardon, & Daste, 1984). The Denver Developmental Screening Test (DDST) is one of the most frequently used screening devices. It is designed so that health professionals, educators, and others may learn to administer it without extensive training. The DDST may serve to alert professionals of the need to further evaluate signs of possible developmental lags. For the severely mentally retarded child, the DDST may serve as the initial method of validating parental interview information. Therefore, the DDST may provide realistic information when a parent is unable to accurately describe the child's development. The scale is designed to evaluate the functioning of children from birth to 6 years old.

The DDST is designed to assess a child's functioning in the areas of social behavior, self-help skills, eye-hand coordination, receptive and expressive language, and gross-motor skills (such as sitting up and walking). The ability to see and hear is also evaluated. The examiner is expected to choose, from among the 105 items, the ones that are appropriate for the child's age. The test requires materials such as a box of raisins, a rattle, and a tennis ball. These materials are used to directly assess the child's development. A few questions are to be answered by the parent. The scoring of the DDST is designed to identify as delays any failure to make a response that 90% of a younger normative group would make. Thus, the DDST may be somewhat limited as an evaluation for severely and profoundly mentally retarded children because it does not provide much detailed information on social and cognitive functioning. Frequently, the delays of severely and profoundly mentally retarded children are clearly identifiable without the use of the DDST or other initial screening scales.

The DDST was standardized on a sample of children from Denver, Colorado (Frankenburg, Dodd, & Fandal, Kazuk, & Cohran 1975). Although representative of the Denver population, the DDST norms do not reflect the racial and socioeconomic levels of the country. The test-retest reliability of the DDST has ranged from .66 to .93 for the various age groupings of the DDST (Sattler, 1982). However, examiner agreement was high (90%) among the four examiners of children for the normative data. In terms of validity, a study comparing mentally retarded and nonretarded children indicated that the DDST correlated with the Stanford-Binet and Bayley scales at high levels (.84 to .95) (Frankenburg, Camp, & Van Watta, 1971). The DDST has been shown to correlate with shorter screening devices (e.g., the Pre-screening Developmental Questionnaire) that are based on the DDST (Burgess *et al.*, 1984).



The developmental screening scales and the more in-depth developmental scales are useful as methods of identifying areas where the severely or profoundly mentally retarded child may benefit from rehabilitation. These scales allow the psychologist and other professionals to devise a rehabilitation plan for the child at a preschool age. The information obtained also helps to differentiate the mentally retarded child from the child who has a developmental delay that is the result of a visual, auditory, or other physical handicap.

### *Piagetian-Based Scales of Infant Development*

Dunst (1982) discussed the differences between traditional psychometric tests of infant development and Piagetian scales. Three significant differences were noted, both theoretically and conceptually:

1. The basis of traditional infant development tests is a unitary conceptualization of intelligence. Piagetian scales are based on the understanding that cognitive performance early in life is a composite of "relatively discrete abilities or traits."

2. Traditional tests assume an additive conception of development, with no significant attention to possible interrelationships among test items. Piagetian scales are based on a sequential and ordinal progression of items. Successively higher levels of ability indicate that different types of sensorimotor skills have developed in a hierarchical fashion (from simple forms to more complex forms of behavior).

3. Unlike the traditional conception of a fixed rate of development, Piagetian-based scales assess the rate of development as affected by a variety of experiences and environmental influences.

Piaget (1951, 1952, 1954) described the sensorimotor period of life in a developmental sequence of six stages. During this period (from birth to approximately 2 years), sensorimotor cognitive capacity emerges through eight interrelated areas: problem solving, object permanence, spatial relationships, causality, time, vocal imitation, gestural imitation, and play. Intelligence, or cognitive adaptation, emerges from behavioral schemes available from birth. These schemes react to and interact with internal and external stimuli. Toward the end of the sensorimotor period, the child is able to use representational and symbolic behaviors. Piaget's theoretical ideas, as well as his observations of the unfolding competencies during the sensorimotor period, have been used to develop new assessment procedures.

The Casati-Lezine Scales (1968) represent one of these Piagetian measures and use four scales to assess sensorimotor development. These scales address four areas: exploration of objects, visual pursuit and search for hidden objects, use of intermediaries, and combination of objects. The Escalona-Corman Scales (1966) measure the sensorimotor development of object permanence and space. The Uzgiris-Hunt Scales (1975), the best of the Piagetian-based scales, measure the development of sensorimotor skills in seven structurally related areas:

1. Scale I      Visual Pursuit and the Permanence of Objects

2. Scale II Means for Obtaining Desired Environmental Events (problem solving)
3. Scale IIIA Development of Vocal Imitation
4. Scale IIIB Development of Gestural Imitation
5. Scale IV Development of Operational Causality
6. Scale V Construction of Object Relations in Space
7. Scale VI Development of Schemes for Relating to Objects (play)

Scale items vary from 7 (Scale IV) to 14 (Scale I). The items are designed to elicit in the child a range of behaviors. These behaviors, or "critical actions," are the basis of inferences about the child's achievement on a specific scale (functional domain).

Several studies have examined the reliability and the validity of Piagetian-based scales (Dunst, 1980; Dunst & Rheingrover, 1981; Uzgiris, 1983). Interobserver reliability was found to be high ( $r = .85$  to  $.96$ ), with solid short-term test-retest reliability ( $r = .88$  to  $.96$ ). Low long-term stability was found as expected, indicating variability of development for different infants. Comparisons of two different scales measuring the same construct (e.g., space) provided high alternate-forms reliability ( $r = .85$  to  $.95$ ). Construct validity of these scales was also researched (Dunst, 1978; Dunst & Rheingrover, 1981). Findings from a study of mentally retarded infants and toddlers (Dunst, Brassell, & Rheingrover, 1981) indicated at least three factors or clusters at any one age level of development. Similar findings were reported by Wachs and Hubert (1981) on normal infants, indicating multifactors at all three age levels studied. These studies support the Piagetian conceptualization that sensorimotor cognitive capacity is comprised of a number of relatively independent factors and is not a unitary construct.

The clinical use of Piagetian scales can be derived from both quantitative and qualitative descriptions of the child tested. The quantification of sensorimotor behaviors uses estimated developmental ages (EDAs), assigned to landmarks on the scales. Dunst (1980) assigned EDAs to the Uzgiris-Hunt scales. In a later study, the concurrent validity of these EDAs was studied with mental age performances on the Bayley and Griffiths scales (Dunst, Rheingrover, & Kistler, 1983). The average of the separate EDAs on the Uzgiris-Hunt scales was used as an estimate of the child's sensorimotor age (SA). The SAs correlated above  $.80$  with the mental age performances on the Bayley and Griffiths scales.

The use of EDAs and SAs allows for communication among professionals, but without much information that leads toward an in-depth understanding of the particular behavioral profile of the child. This needed information is mostly provided by the qualitative description of the child. Dunst (1982) reported on the use of qualitative descriptions of sensorimotor achievements. Such descriptions can provide the necessary information on the child's highest level of functioning (per scale), the particular configuration or the unique profile (strengths and weaknesses) of the child, and item-by-item descriptions of specific behaviors. The sensorimotor achievement profile can also aid in differentiating among children with specific developmental disabilities. So far, pathological patterns of development have not been sufficiently researched. However, Dunst (1982) re-

ported preliminary data indicating that developmentally disabled children show patterns of performance different from the patterns of normally developing children.

### *Sewall Early Education Developmental (SEED) Profiles*

The SEED Profiles have been developed by a number of specialists (speech and language, occupational and physical therapy, child development, and special education) in reaction to the inability of known standardized tests to assess fairly the abilities of handicapped children (Herst, Wolfe, Jorgensen, & Pallan, 1976). SEED evaluation tools were based on a variety of available standardized tools in an attempt to consolidate tasks and to form structured procedures to give a more "realistic and complete picture of the child's abilities" (Herst *et al.*, 1976).

SEED Profiles are not the product of a specific theoretical position on child development, but the result of a pragmatic accumulation of experience in working with handicapped children. Therefore, the profiles adapt a more eclectic use of ideas from a number of assessment procedures.

The traditional view of test development for intelligence and adaptive skills is based on the aggregation of simultaneously occurring behavioral achievement at a particular chronological age. This view is represented in the SEED Profiles via the use of age (in weeks and months) as a measure for the normality or pathology (the presence or absence) of a behavior.

The Piagetian position, favoring ordinal scales, advocates a hierarchy progression of achievements, when higher levels of achievement are derived and include or modify lower levels of achievement. This position also advocates a developmental process with several relatively independent abilities (and not a unitary ability). This position is represented in the SEED Profiles by the use of eight separate developmental topics (profiles), giving the examiner the choice of using all the profiles or selected ones. A complete diagnosis of the child's developmental status requires the use of the entire set of profiles.

#### *The Profile*

Development is assessed by eight profiles, each addressing a specific developmental dimension: (1) Social-Emotional; (2) Gross Motor; (3) Fine Motor; (4) Adaptive-Reasoning; (5) Receptive Language; (6) Expressive Language; (7) Feeding; and (8) Dressing and Simple Hygiene. Each developmental profile is further broken down into specific developmental categories (skills). The developmental value of a specific behavior is measured by its presence or absence at a specific age. All profiles and categories assess expected achievements in intervals of four weeks for the first year of life. The second year of life is assessed in intervals of three months. The third and fourth years of life are assessed in intervals of six months. The appendix gives a more detailed presentation of the eight profiles evaluated by SEED, with the specific categories assessed. Examples of administered items or expected observations are included.

The SEED assessment requires a room with adequate floor space, a small table, and a small, stable chair. The functional assessment does not require a specific order of presentation of profiles; rather, it is adapted to the responsiveness of the child. The evaluator gives credit for performance demonstrated at any given time during the evaluation and not necessarily on demand. Performance is maximized by comforting and interacting with the child before assessment. It is acceptable to allow the parents to be present to support the child and help the examiner. The manual specifies the equipment (e.g., toys, objects, and tools) needed to support each profile, for example, a string attached to a small toy for the assessment of play (part of the Social-Emotional profile).

The Scales of Functional Independence are a measure of eating, dressing, and toileting skills. The eating scale is best completed from direct behavioral observation of the child. The other scales may be completed from information provided by an informant. The Scales of Social Adaptation are a way of assessing social adjustment and social interactions. The Balthazar Scales of Adaptive Behavior were normed on institutional residents at a state training school in Wisconsin. The group ranged in age from 5 years to 57 years and had IQs below 35. The norms are not adequate because of the small sample. Interrater reliability on the Scales of Functional Independence was  $r = .42$  to  $1.00$ , with a median of  $x = .81$ . The greater variability on the Social Adaptation Scales may be due to variability in responses to various people. Further study is needed to establish the reliability and validity of these scales. They seem to hold promise as a method of monitoring and planning the treatment of the severely and profoundly mentally retarded person.

These profiles were meant not to test curriculum, but to evaluate functions toward the development of individualized, programmatic objectives for the child.

Each profile skill area provides detailed descriptions of expected behaviors in reaction to parents, examiner, and objects per age intervals. The manual provides clear and detailed instructions for charting the performance of the child. Basal and ceiling levels of performances are used to indicate the age level at which the child begins to miss completion of behaviors, as well as the highest level at which the child is successful in performing at least one item per category. A master profile sheet is used to summarize the charting on the eight developmental profiles. All basal and ceiling levels in each category are added and then divided in half to give an average. Averages from each category (skill area) are added and divided by the number of categories in order to give a developmental age per profile. The eight developmental ages obtained are charted on the master profile sheet.

Charted findings and a written report are presented to summarize the overall abilities of the child. The report includes a detailed set of specific recommendations for the further diagnosis of specific skills, as well as future programmatic efforts by a multidisciplinary team and the parents.

The SEED Profiles allow for frequent reevaluations of specific skills, categories, and/or profiles, as well as for periodic complete evaluations. Programmatic suggestions and objectives can be directly based on the items or tasks used for

assessment because of the items' functional-adaptive nature. Developmental gains can be easily recognized by the individuals directly involved in training or intervention, without a formalized assessment event.

The developers of the SEED Profiles omitted or redefined technical terms, allowing for the administration of the profiles by experienced professionals and paraprofessionals. It is recommended in the manual that appropriate specialists be consulted to interpret results and to assist in programmatic recommendations. For example, consulting with a speech pathologist helps significantly in the interpretation of the Feeding Profile.

The SEED manual does not specify validity and reliability factors. The manual provides the list of sources (research and literature) for the development of the profiles.

In this section, developmentally based assessment methods that have only recently begun to be used a good deal were reviewed. A very popular method, which will be discussed next, is adaptive behavior assessment.

## ADAPTIVE BEHAVIOR ASSESSMENT

In assessing the severely and profoundly mentally retarded child's overall functioning, adaptive behavior is as important a factor as intellectual level. A number of adaptive behavior scales have been developed in order to aid in the evaluation of the mentally retarded child's ability to respond to his or her environment in a socially acceptable and effective manner. By using adaptive scales, the examiner of the severely and profoundly mentally retarded child has a means of identifying behaviors that are assets and deficits of the child in the effort to become as normalized and independent in functioning as possible (Leland, 1983). From these scales, the areas for future training may be identified and prioritized. Also, the inclusion of areas such as physical development and social responsibility should help health-care professionals to determine the aspects of the child's mental retardation that may interfere with her or his chance of being rehabilitated.

### *AAMD Adaptive Behavior Scale*

One of the most effective adaptive behavior scales is the AAMD Adaptive Behavior Scale (ABS; Forness & Nihira, 1984; Nihira, Foster, Shellhaas, & Leland, 1969). The ABS was originally developed by a group of psychologists at the Parsons State Hospital and Training Center in Kansas, under the auspices of the AAMD. Since it was first published, it has been revised several times in order to improve its psychometric properties (Fogelman, 1975; Lambert, Windmiller, Cole, & Figueroa, 1975a). Lambert, Windmiller, Cole, and Figueroa (1975b) developed a version of the ABS for use with children in public schools rather than institutions.

The ABS consists of two parts, which are designed to measure independent functioning in daily living and personal responsibility (Part I) and maladaptive

social behaviors (Part II) (Fogelman, 1975). Areas assessed in Part 1 of the ABS are independent functioning (e.g., travel), physical development, language development, concept of numbers and time, vocational ability, self-direction (e.g., use of leisure time), responsibility, and socialization. Within each domain of the ABS, items are arranged in a logical developmental order. This ordering of items makes the ABS an effective aid in deciding where to begin an individual's rehabilitation program. Also, the design of Part I makes it a helpful tool for evaluating the progress of the severely and profoundly mentally retarded. Part II of the ABS concerns maladaptive behaviors. The domains of Part II are violent and destructive behavior, antisocial behavior, rebellious behavior, eccentric habits, self-abusive behavior, sexually aberrant behavior, psychological disturbances, and use of medications. This section of the ABS is not arranged in a developmental progression.

The Adaptive Behavior Public School Version (ABS-PSV) is similar to the ABS (Lambert, Windmiller, Cole, & Figueroa, 1975b). Certain domains that are less relevant to a school setting are omitted (e.g., domestic activities in Part I). It is to be used with children of ages 7 years 3 months to 13 years 2 months. The ABS and the ABS-PSV may be administered in one of the following ways: (1) a parent or teacher interview is conducted, and the professional completes the scale based on the information; (2) the professional completing the scale bases responses on his or her own knowledge of the person; or (3) the examiner solicits information from several persons and completes the scale based on the composite information.

The reliability of a child's ABS ratings depends partially on how well the informant knows the child, and on whether the child's optimal behavior is exhibited around the informant. Some of the items on the ABS are worded in a vague manner, which results in the informant's having to make an interpretation that may be inaccurate (Knapp & Salend, 1983). Also, when using a parent as an informant, the professional may need to assess whether the parent's emotions about the child influence his or her perceptions of the child's behavior. In a comparison of moderate and severely mentally retarded children's ratings on the ABS-PSV with parents and teachers as informants, Mealor and Richmond (1980) found that the parents tended to rate their children at higher levels than the teachers in the areas of independent functioning, economic activity, domestic activity, and vocational activity; however, these authors stated that the areas of disagreement concerned items where parents would have more opportunities to observe the child. The ABS manual indicates interrater reliabilities in an acceptable range for Part I of the scale ( $r = .71$  to  $.93$ ;  $\bar{x} = .86$ ). There is more variability reported in the Part II interrater reliabilities ( $r = .37$  to  $.77$ ;  $\bar{x} = .57$ ) (Fogelmann, 1975). Reliability has been found to be unacceptably low on interrater reliabilities of part II of the ABS ( $r = .32$  to  $.84$ ;  $\bar{x} = .56$ ) (Isett & Spreat, 1979). The inconsistency in ratings of Part II of the ABS could be due to different interpretations of the items, or to actually observing different behavior by the client dependent on the presence of different observers. The limited evidence of test-retest reliability indicates fairly high levels of reliability ( $r = .85$  to  $.97$  on Part I, and  $r = .60$  to  $.97$  on Part II) (Isett & Spreat, 1979).

The ABS standardization was based on mentally retarded children and adults in 68 institutions in the United States. The norms in the manual are of limited value when evaluating a mentally retarded child who is not in an institutional setting, as no information is provided about functioning outside an institution. For the evaluation of mentally retarded children in the community, the AAMD ABS-PSV is more appropriate because it has norms based on class placement (i.e., EMR [educable mentally retarded], TMR [trainable mentally retarded], regular class). The ABS-PSV may not provide adequate information concerning the functioning of the profoundly mentally retarded or multiply handicapped child. In scoring both versions of the ABS, the child's functioning in the various domains is compared to that of the normative group, and a percentile profile is developed. From the profile, the examiner is able to identify strengths and weaknesses.

According to the ABS manual, it discriminates between individuals functioning at different adaptive levels that are based on clinical impressions and institutional placement. The ABS has been found to correlate with intellectual level (Sattler, 1982). There are two studies concerned with concurrent validity of the ABS. Millham, Chilcutt, and Atkinson (1978) found low comparability of ABS domain ratings and observations of children's actual behavior. In contrast to these findings, Forness and Nihira (1984) obtained correlations between the ABS and classroom behaviors of attending, verbal or gestural communication, and peer responsiveness to the child. However, Forness and Nihira (1984) cautioned that their results may be more a reflection of the generalizability of adaptive behavior measures across settings because the ABS ratings reflected ward behavior and not classroom behavior. More research is needed to clarify the value of the ABS for predicting classroom functioning. At present, it is more logical to use the ABS as only one of several methods of assessing the severely and profoundly mentally retarded. Some direct observation of behavior is probably necessary in order to get an accurate understanding of the child's functioning.

### *Other Adaptive Behavior Scales*

The Vineland Social Maturity Scale has been one of the more popular methods of obtaining information concerning the functioning of the mentally retarded (Doll, 1935, 1940, 1965; Meador & Richmond, 1980). The Vineland was revised and expanded by Sparrow, Balla, and Cicchetti in 1984. The Vineland Adaptive Behavior Scales (Sparrow *et al.*, 1984) are designed to measure the personal and social sufficiency of individuals from birth to adulthood. Like the Vineland Social Maturity Scale (Doll, 1935), the Vineland Adaptive Behavior Scales are useful in evaluating the severely and profoundly mentally retarded person by gaining the information from persons familiar with the mentally retarded individual's self-help and social functioning.

The three versions of the Vineland (i.e., Interview Edition, Survey Form; Interview Edition, Expanded Form; and Classroom Edition) measure adaptive behavior in the domains of communication, daily living skills, socialization, and

motor skills. Also, the Survey Form and the Expanded Form include an optional maladaptive behavior domain. A trained examiner administers the Survey Form or the Expanded Form to a parent or caregiver of a child from birth to 18 years 11 months. This information is recorded in a record booklet during the interview. The Classroom Edition is a questionnaire that is completed by a teacher of the student from 3 years of age to 12 years 11 months. The questionnaire and the interview are interpreted by a trained evaluator.

Each of the editions of the Vineland Adaptive Behavior Scales was standardized on a national sample of handicapped and nonhandicapped individuals. The normative groups were representative of the U.S. population in terms of race, sex, ethnic group, region of the country, and parents' education. As there were no severely or profoundly mentally retarded children in the normative groups, the norms are somewhat limited for estimating how well the severely or profoundly mentally retarded child will function in settings with other retarded children. However, the inclusion of norms for emotionally disturbed, hearing-impaired, and visually impaired children should be helpful when assessing the adaptive behavior of multihandicapped children or making a differential diagnosis between mental retardation and other handicaps. An individual's raw score may be compared to the scores of the normative groups by percentile rank, adaptive levels, and age equivalents. Age equivalents and adaptive levels are given for each domain.

The Vineland Adaptive Behavior Scales include many more items than the original scale. Items included in the Vineland Adaptive Behavior Scales were selected based on a tryout of a form of the scale with a national sample. The data from the national tryouts were used to create the final form of the Vineland. Split-half reliability coefficients for the normative sample on the Survey Form domains at different levels were Communication,  $r = .73$  to  $.94$ ; Daily Living Skills,  $r = .83$  to  $.94$ ; Socialization,  $r = .78$  to  $.94$ ; and Motor Skills,  $r = .70$  to  $.95$ . Split-half reliabilities for the supplemental norms of the handicapped groups were higher than those for the main normative groups. Test-retest reliability for the main sample in terms of the four domains and composite standard scores ranged from  $r = .76$  to  $.93$ . Interrater reliability for a portion of the main sample was generally high.

Factor analyses supported the validity of the four domains and the composite score. The correlation between the Vineland Adaptive Behavior Scales and the original Vineland was  $r = .55$ . Bolen, Childers, and Durham (1984) found a correlation of  $.97$  between the original and revised Vineland for a group of mentally retarded adults in a residential facility. These researchers also investigated the relationship between the Vineland Adaptive Behavior Scales and the AAMD Adaptive Behavior Scale. Correlations between the domains ranged from  $.40$  to  $.70$ . The Vineland and the Kaufman Assessment Battery for Children, an intelligence test, correlated low in most areas ( $r = .08$  to  $.52$ ). These low correlations support the hypothesis that the Vineland measures adaptive behavior, which is different from intelligence.

In summary, the Vineland Adaptive Behavior Scales seem to represent a fairly reliable and valid instrument for assessing the severely mentally retarded



child's adaptive behavior strengths and weaknesses. This information should aid professionals in program planning. A comparison of results on the various forms for an individual will help in the assessment of any differences and similarities in functioning in different settings; however, because of the newness of the Vineland, much more research is needed to fully establish its effectiveness with severely and profoundly mentally retarded children. Research (Gardner & Giampa, 1971) with the original Vineland showed that it was a valid method for assessing the social functioning of the severely and profoundly mentally retarded. A similar finding is likely with the Vineland Adaptive Behavior Scales.

The Balthazar Scales of Adaptive Behavior (Balthazar, 1976) were specifically developed for assessing the adaptive behavior of severely and profoundly retarded children and adults. The two parts of the scale are the Scales of Functional Independence and the Scales of Social Adaptation.

The Scales of Functional Independence are a measure of eating, dressing, and toileting skills. The eating scale is best completed from direct behavioral observation of the child. The other scales may be completed from information provided by an informant. The Scales of Social Adaptation are a way of assessing social adjustment and social interactions. The Balthazar Scales of Adaptive Behavior were normed on institutional residents at a state training school in Wisconsin. The group ranged in age from 5 years to 57 years and had IQs below 35. The norms are not adequate because of the small sample. Interrater reliability on the Scales of Functional Independence was  $r = .42$  to  $1.00$ , with a median of  $r = .81$ . The greater variability on the Social Adaptation Scales may be due to variability in responses to various people. Further study is needed to establish the reliability and validity of these scales. They seem to hold promise as a method of monitoring and planning the treatment of the severely and profoundly mentally retarded person.

The assessment of adaptive behavior is critical in diagnosing and rehabilitating the severely and profoundly mentally retarded. Several scales are available that seem adequate as measures of adaptive behavior; however, more research is needed concerning how to most effectively use these scales. Also, most scales lack much normative data concerning the optimal functioning of the severely and profoundly mentally retarded.

### *Assessment of Reinforcement Preferences*

The training programs for severely and profoundly mentally retarded individuals often include the use of behavior modification programs. When designing behavioral programs for children with the more severe levels of mental retardation, a major concern becomes how to identify a variety of reinforcers. The severely and profoundly mentally retarded child's reinforcement preferences must be identified indirectly by asking adults who are familiar with the child (Rotatori, Fox, & Switzky, 1979). A reinforcement survey hierarchy was developed by Rotatori, Fox, and Switzky (1979) to facilitate the identification of reinforcers for severely and profoundly mentally retarded children and adults. The Reinforcement Survey is to be completed by someone familiar with the

child. Also, one could take the list of food, activity, tactile, auditory, and social items and directly expose the child to the items in order to identify and develop new potential reinforcers.

The Reinforcement Survey Hierarchy consists of 156 items that are categorized under the areas of eating, drinking, listening to (e.g., a music box), looking at (e.g., lights and faces), playing with, academic activities (e.g., coloring and scribbling), home living chores, touching, social (e.g., verbal praise), smelling (e.g., perfume), and high-frequency behaviors. The high-frequency behaviors are behaviors that severely and profoundly mentally retarded people often use as self-stimulation (e.g., rocking). Rotatori, Fox, and Switzky (1979) suggested using the high-frequency behaviors to reinforce low-frequency behaviors. However, it seems that these reinforcers should be used cautiously because they are maladaptive behaviors.

The Reinforcement Survey Hierarchy was established by having the teachers of 127 severely and profoundly mentally retarded individuals identify reinforcers being used in the training of these mentally retarded persons. These students were being trained in workshops and schools. Rotatori, Fox, and Switzky (1979) also asked educators to list reinforcers used in training under the 11 categories used in the reinforcement survey. Then, the authors of the scale reviewed files of severely and profoundly mentally retarded children and adults in order to identify reinforcers used in therapy.

The survey is administered by a person familiar with the client. Each item is rated on a 5-point scale according to the degree that the client will perceive it as reinforcing. A rating of "No Opportunity" is made if the mentally retarded person has no experience with the stimulus. The scale has not received validation by direct behavioral observation of preferences. However, it seems valuable as a means of expanding the potential reinforcers for the severely and profoundly mentally retarded beyond the usual food reinforcers.

In addition to this formalized scale, the vast majority of treatment studies on severely and profoundly mentally retarded persons have used operationally defined target behaviors. Feeding, dressing, self-injurious behavior, and rumination are just a few of the behaviors that have been assessed. The reader is referred to books by Matson and Bruening (1983), Matson and McCarthy (1981), and Whitman, Scibak, and Reid (1982) for an extensive review of this topic.

## CONCLUDING REMARKS

The complexity and multiplicity of needs addressed in the provision of services to a severely disabled child and his or her family demand a multidisciplinary and well-coordinated team approach. Therefore, the differential diagnostic process requires an appreciation of two interrelated considerations.

The diagnostician is asked for an objective, educated, and clear presentation of the developmental status of the child. In addition, the diagnostic information and the inferences for programming have to be communicated to a large number

of "significant others" (family members, teachers, and other service providers) in the life of the child. Consequently, the diagnostician is required to present findings to a group of people widely varied in their expertise, skills, and sophistication in using diagnostic data.

These considerations demand that the evaluator approach the disabled child with both a theoretical mastery of the cognitive and psychological development of the child and a solid understanding of the contributions made by other disciplines (e.g., medicine, speech, and education). The assessment of the disabled child necessitates the integration of data from many resources and from a battery of tests (e.g., a review of the medical data, interviews with the parents, observations of the child, developmental scales, and adaptive behavioral assessments). Such an evaluation cannot be accomplished in a single session but require a succession of evaluative events, leading toward a comprehensive profiling of the child's developmental and adaptive status.

The diagnostician has to develop skills in crossing language barriers among different disciplines and in presenting assessment findings to a multidisciplinary team of service providers. Furthermore, the evaluator has to be sensitive to the need of paraprofessionals and parents for a nontechnical and pragmatic translation of the assessment findings. The sensitivity of the evaluator to the emotional readiness and the coping capacity of the parents (to rear their handicapped child) plays an important role in determining the parents' acceptance of the diagnostic findings and their cooperation with the intervention plan.

### *Recent Advances in Differential Diagnosis*

In reviewing the literature on research and clinical practice, it is evident that the field of assessment of the developmentally disabled child is still in its formative stages, particularly for those children with the lowest levels of cognitive functioning. Many of the available assessment procedures are based on norms from samples of healthy children. Consequently, the validity of these procedures for a disabled population is questionable, and the programmatic value of diagnostic inferences is often subjective and speculative. Furthermore, the available assessment tools provide only a restricted capacity to differentiate diagnostically between severely and profoundly mentally retarded children. These limitations include difficulties in differentiating among categories of handicapping conditions (e.g., the capacity to identify unique patterns of developmental lags of the visually impaired or the cerebral palsied and the severely disabled).

The needs for more sensitive assessment procedures and the development of diagnostic tools based on samples from the disabled population have stimulated valuable research on severely disabled children. The following research studies are presented to exemplify recent contributions to a more refined differential assessment of severely disabled children.

Jan Blacher (1984b) reviewed and critiqued the literature on "the stages of adjustment presumably experienced by parents of children with mental retardation" (p. 57). Blacher's critique highlights the need to develop objective instru-

ments to quantify and operationalize parental adjustment and to test the validity of the underlying assumptions of stages of adjustment. Such an instrument can also provide valuable information to the professionals working with these parents, in regard to their adjustment and coping capacity in the presence of a disabled child in the family.

Merbler and Wood (1984) studied the relationship between the orientation and the mobility skills of mentally retarded and visually impaired children and adults, as well as several nonvisual variables (motor, sensory, and concept skills). The results of this study strongly suggest the value of training in motor, sensory, and concept skills as part of the basic mobility training for the visually impaired and handicapped child. This study validates the Peabody Mobility Scale (from the Peabody Mobility Kit for Multiply Handicapped Blind Children) as a means of providing information on prerequisites for more independent mobility.

Kahn (1983) studied the relationship of the Uzgiris-Hunt scales (1975) with the Adaptive Behavior Scale and receptive-expressive emergent language. His investigation used severely and profoundly mentally retarded children to study the parameters of cognitive development and their relationship to the development of several skills (e.g., communication). This study added validity to the Piagetian conceptualization of the sensorimotor stage, as well as to the applicability of Piagetian-based scales to disabled children.

For some severely and profoundly mentally retarded children, the best intervention and programmatic efforts result in very little behavioral progress. However, the care that these children demand from their parents and family members usually results in sacrifices and expenditure of time, energy, and money. Such a demand, more often than not, compromises the integrity of the family and the well-being of its members, ultimately jeopardizing the capacity to care for the child. Consequently, the child's needs are not met by the family, or the child is institutionalized. Carl J. Dunst (1983) proposed an assessment and intervention approach "with families of profoundly handicapped children, who place unusual and excessive demands and strains upon their family members" (p. 1). Using the conceptual framework and postulates of ecological psychology and social systems, Dunst proposed a *family-focused* approach to evaluation and programming. In this approach, the child is not the focus of assessment and the provision of services. Rather, the needs of the entire family unit are evaluated. The needs of the disabled child are considered in their interaction with those of other family members. Such an approach to assessment is able to identify the necessary systemic mediators for the integrity of the family and the physical-emotional well-being of its members.

The intervention efforts resulting from such an assessment are an attempt to meet both the needs of the child and the needs of the other family members. For example, parents need to engage in desired non-child-oriented activities and to promote personal and professional interests. In addition, siblings also need adequate parental attention and nurturance, as well as the freedom to pursue hobbies and personal social relations.

Interventions promoting the capacity of family members to rear the pro-

foundly disabled child, while allowing the family members a pursuit of personal goals, result in a drastic reduction of stress and family conflicts. Such an approach increases the probability that the profoundly handicapped child can be properly cared for within the family network, without a serious threat to the physical and emotional well-being of the entire family.

## APPENDIX: THE SEWELL EARLY EDUCATION DEVELOPMENTAL (SEED) PROFILES

1. SEED Social-Emotional Developmental Profile:
  - a. Visual regard—an observable reaction of the healthy child from birth. Example: At the age of 8 weeks, the child is expected to smile socially at the examiner.
  - b. Socialization—expected observations from birth. Example: At the age of 12 weeks, anticipatory excitement movements of the body are expected.
  - c. Identification of self and others—expected observations from approximately 8 weeks of age. Example: At 28 weeks of age, fear of strangers (reactions of crying and fussing) is expected.
  - d. Imitation—expected observations from approximately 24 weeks of age. Example: Child is expected to imitate knocking with hands at the age of 28 weeks.
  - e. Play—expected observations from approximately 12 weeks of age. Example: Child pulls on a toy by a string at age 15 months.
2. SEED Gross Motor Developmental Profile:
  - a. Body responses—expected observations from birth. Example: Lying on back, infant grasps foot at the age of 24 weeks.
  - b. Head control—expected observations from birth. Example: On stomach, infant holds head up so chin is 2–3 inches above surface at the age of 12 weeks.
  - c. Rolling—expected observations from birth. Example: At the age of 8 weeks, no rolling when supine.
  - d. Sits—expected observations from birth. Example: At the age of 40 weeks, child gets up to sit independently from back lying.
  - e. Creeps—expected observations from birth. Example: By 20 weeks of age, from prone position, child lifts head and chest with arms in front supporting weight.
  - f. Stands—expected observations from birth. Example: At 44 weeks of age, child stands holding onto furniture.
  - g. Walks—expected observations from 48 weeks of age. Example: At 48 weeks of age, walks sideways holding onto furniture.
  - h. Stairs—expected observations from 15 months of age. Example: At 15 months, child climbs upstairs on all fours.
  - i. Ball—expected observations from 52 weeks of age. Example: At 18 months, child hurls ball from stand.

- j. Jumps—expected observations from 24 months of age. Example: At 30 months, child jumps up and down in place, with both feet together.
  - k. Miscellaneous—additional observation from 18 months of age. Example: At 18 months, child seats self in knee-high chair.
3. SEED Fine Motor Developmental Profile:
- a. Hand positions and reaching movements—observations expected from 4 weeks of age. Example: At age 20 weeks, infant definitely reaches for objects, with or without touching objects.
  - b. Grasp—observations expected from 4 weeks of age. Example: At 8 weeks of age, infant holds briefly a rattle placed in hand.
  - c. Release patterns—observations expected from 28 weeks of age. Example: Child begins to drop objects on purpose at the age of 40 weeks.
4. SEED Adaptive-Reasoning Developmental Profile:
- a. Visual pursuit (eye and head movements)—observations from 4 weeks of age. Example: At 12 weeks of age, infant focuses on objects 3 feet away.
  - b. Activity with rattle (body movements)—expected observations from 12 weeks of age. Example: Child lifts cup from table at 24 weeks of age.
  - c. Activity with 1-inch blocks and up—expected observations from 12 weeks of age. Example: lifts cup from table at 24 weeks of age.
  - d. Activity with ring and string—expected observations from 16 weeks of age. Example: At 28 weeks of age, child transfers ring from hand to hand.
  - e. Activity with pellet and bottle—expected observations from 20 weeks of age. Example: At 32 weeks of age, child reaches for bottle first (pellet and bottle on table next to each other).
  - f. Activity with bell—expected observations from 24 weeks of age. Example: At 44 weeks of age, child looks at and pokes clapper bell.
  - g. Formboard and puzzles—expected observations from 48 weeks of age. Example: At 18 months, child places two out of three shapes correctly.
  - h. Activity with pegboard—expected observations from 48 weeks of age. Example: At 21 months, child completes square-hole pegboard without help.
  - i. Activity with crayon—expected observations from 48 weeks of age. Example: At 18 months, child imitates line.
  - j. Activity with box—expected observations from 48 weeks of age. Example: At 15 months, child takes off box cover to find toy.
  - k. Miscellaneous items—additional observations from 32 weeks of age. Example: At 44 weeks of age, child shows preference for one toy over another.
- 5–6. SEED Speech and Language Developmental Profiles:
- a. Auditory response and memory—expected observations from 4 weeks of age. Example: At 44 weeks of age, child responds to rhythmic music by body and/or hand movements.
  - b. Receptive language skills—expected observations from 4 weeks of age.

- Example: At 18 months, child can identify three or more parts on a doll.
- c. Expressive language skills—expected observations from 4 weeks of age. Example: At 21 months, child has 20 words in his or her vocabulary.
7. SEED Feeding Developmental Profile:
    - a. Tongue and lip reactions—expected observations at 4 weeks of age. Example: At 15 months, child can move tongue from side to side.
    - b. Self-feeding behaviors—expected observations at 16 weeks of age. Example: At 21 months, child handles cup well with two hands.
  8. SEED Dressing and Simple Hygiene Developmental Profile:
    - a. Dressing behaviors—expected observations from 12 weeks of age. Example: At 16 weeks of age, child may pull clothes over face while playing.
    - b. Simple hygiene behaviors—expected observations from 24 weeks of age. Example: At 52 weeks of age, child begins to bring comb to hair.

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# 11 Conduct Problems

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## INTRODUCTION

This chapter is about those children who act out against their social and physical environments with such frequency, intensity, and chronicity that interpersonal relationships with family, school, community, and peer group members become very difficult. Additionally, when the acting out violates the basic rights of others and thus represents potentially illegal activities, as in physical violence against others or property damage and destruction, broader societal relationships are jeopardized.

The magnitude of this form of childhood psychopathology is highlighted not only by its high prevalence and chronicity but also by its monetary, social, and personal consequences. Problems involving conduct difficulties represent approximately one-third to one-half of all family and school referrals for mental health services. Additionally, conduct problems are the most commonly cited reason for referral to a behavior therapist's office (Herbert, 1978; Patterson, Reid, Jones, & Conger, 1975; Robins, 1981). The monetary, social, and personal costs of more serious antisocial acts are illustrated by a reported annual school-vandalism cost of \$600 million, along with some 70,000 serious assaults on teachers and hundreds of thousands additional ones on students (Tygart, 1980).

Although most childhood problems decline spontaneously with age, chronic problems of conduct involving aggression and other antisocial behaviors tend to persist if left untreated (Olweus, 1979; Robins, 1966; Shechtman, 1970). In fact, these chronic problems are significantly correlated with such serious adult psychopathology as psychoses, criminal behavior, and alcoholism (Robins, 1979). As a result, and perhaps even more serious, chronic conduct problems in childhood and adolescence are perpetuated, as these same individuals as adults have children with an increased risk for similar problems.

The term *conduct problems* is used in this chapter in a descriptive sense to emphasize the disruptive nature of children's acting-out behavior difficulties. Terms such as *destructive, verbally and physically assaultive, disobedient, oppositional, temper tantrums, violent, out-of-control, and extreme negativism* portray the disruptive interpersonal dimension of the conduct problems. Other terms, such as *antisocial, socially aggressive, delinquent, and sociopathic personality*, used by various

mental health and correctional agency professionals, emphasize the broader socially disruptive nature of the child's problems.

Formal clinically or empirically based diagnostic and classification systems include a variety of disorders or categories that involve conduct problem symptoms. These difficulties may represent the central feature of the disorder (e.g., conduct disorder or oppositional disorder) or may be only one of a complex of other symptomatic features requiring differential assessment and treatment (e.g., schizophrenia). Other diagnostic categories within various classification systems in which serious conduct difficulties are, or may be, present include characterological delinquency, attention deficit disorder, adjustment disorder with disturbance of conduct, socialized aggressive disorder, pervasive developmental disorders, specific developmental disorders, intermittent explosive disorder, mental retardation, psychomotor epilepsy, affective disorders, and schizophrenic disorders (American Psychiatric Association [APA], 1980; Quay, 1979, 1983; Smiley, 1977; Weiner, 1982). Many children with recurring antisocial behavior come into contact with the police and become juvenile court cases instead of being provided psychiatric services and a resulting diagnosis (Weiner, 1982).

As specific examples, Puig-Antich (1982) reported that 33% of a sample of prepubertal boys with major depression also met the criteria for conduct disorder in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III; APA, 1980). Satterfield, Hoppe, and Schell (1982) reported a high correlation between attention deficit disorder and conduct disorder among institutionalized adolescents. This relationship is also present in the community classroom setting, as conduct problems, learning disabilities, and hyperactivity coexist in many children (Ross & Ross, 1982). Rutter, Tizard, and Whitmore (1970) reported that 33% of a sample of children identified as conduct-disordered were also reading-disabled, and that 25% of slow readers showed antisocial behavior. In fact, serious problems in academic areas represent the initial reason for identification by school and mental health services of many children who are later diagnosed as conduct-disordered (Kazdin & Frame, 1983). Conduct difficulties described in children with specific developmental disorders (Pfeffer, Plutchik, & Mizruchi, 1983), psychoses (Lewis, Shanok, Grant, & Ritvo, 1983), psychomotor epilepsy (Lewis, Pincus, Shanok, & Glaser, 1982), mental retardation (Gardner & Cole, 1984), and pervasive developmental disorders (Johnson & Baumeister, 1981) provide other specific illustrations of this interrelationship. Thus, conduct problems take many different forms; may represent features of various syndromes of pathology; may create legal, academic, and mental health concerns; and may require either primary or secondary intervention attention. As a result, adequate comprehensive and differential assessment is of central importance.

## ASSESSMENT: GENERAL CONSIDERATIONS

In the clinical assessment of conduct difficulties, it is necessary initially to obtain a detailed description of the presenting conduct problems and the social

and interpersonal circumstances in which the child's behaviors are a problem. That is, what is the child doing in his or her various interpersonal and social settings that creates difficulties? Also, because of the interrelationship of conduct difficulties and other problem clusters, it is important that the clinician be sensitive to the presence of other problem areas. Following this initial impression, more formalized assessment procedures are selected to obtain additional information needed for (1) diagnostic classification(s); (2) the identification of targets for treatment; (3) the design and implementation of a treatment program; and (4) the evaluation of program effectiveness and, when needed, a reconsideration of the contributing factors as a basis for program modifications.

In most instances, chronic problems of conduct requiring clinical attention result from a complex of factors. Assessment, especially that designed to formulate a treatment program, should reflect this complexity. The multicomponent assessment model for conduct problems presented in Figure 1 resulted from our clinical and research experiences, which indicated that the various conduct difficulties cannot be understood, managed appropriately, or modified successfully unless consideration is given to the array of environmental and child factors that may contribute to the acquisition, instigation, and persistent recurrence of such problems (Gardner & Cole, 1984). The four assessment points depicted alert the clinician to evaluate the variety of specific and general environmental and child characteristics that may influence the occurrence of the problem behaviors (Entries 1 and 2), as well as those consequences that may maintain, intensify, or suppress these conduct difficulties (Entries 3 and 4). Assessment data that suggest contributing influences at any of these entry points at the same time identify potential treatment targets.

To elaborate, Entry 1 focuses assessment activities on possible physical and social environmental factors that, when present, serve to instigate or increase the likelihood of conduct problems. The assessment includes a consideration of the immediately preceding events that have served as discriminative stimuli, as well as the setting variables that may be more temporally removed from an actual outburst (e.g., of aggression) but that nevertheless increase the likelihood of this aggressive act (Gardner, Karan, & Cole, 1984). Additionally, broader environmental influences, such as family and teacher expectations, peers who model aggressive behavior, and the range and availability of desired social reinforcers, illustrate other factors that should be assessed.

The entry 2 variables include those internal conditions that, when combined with external stimulus conditions, instigate or increase the likelihood of conduct problem behaviors. Examples of these events include physical states (e.g., pain and fatigue), affective states (e.g., anger, feelings of rejection, and anxiety), and cognitive variables (e.g., covert verbal ruminations of a provoking nature and paranoid ideation). Entry 2 also directs consideration of skill areas and characteristics that, because of their low strength or their absence, increase the likelihood of problems in those inclined to behave disruptively. In illustration of these behavior deficits, an adolescent, when taunted by peers or criticized by adults, may react aggressively because she or he either does not have alternative interpersonal skills in her or his repertoire, or if they are present, she or he does not have the skills to self-manage them.

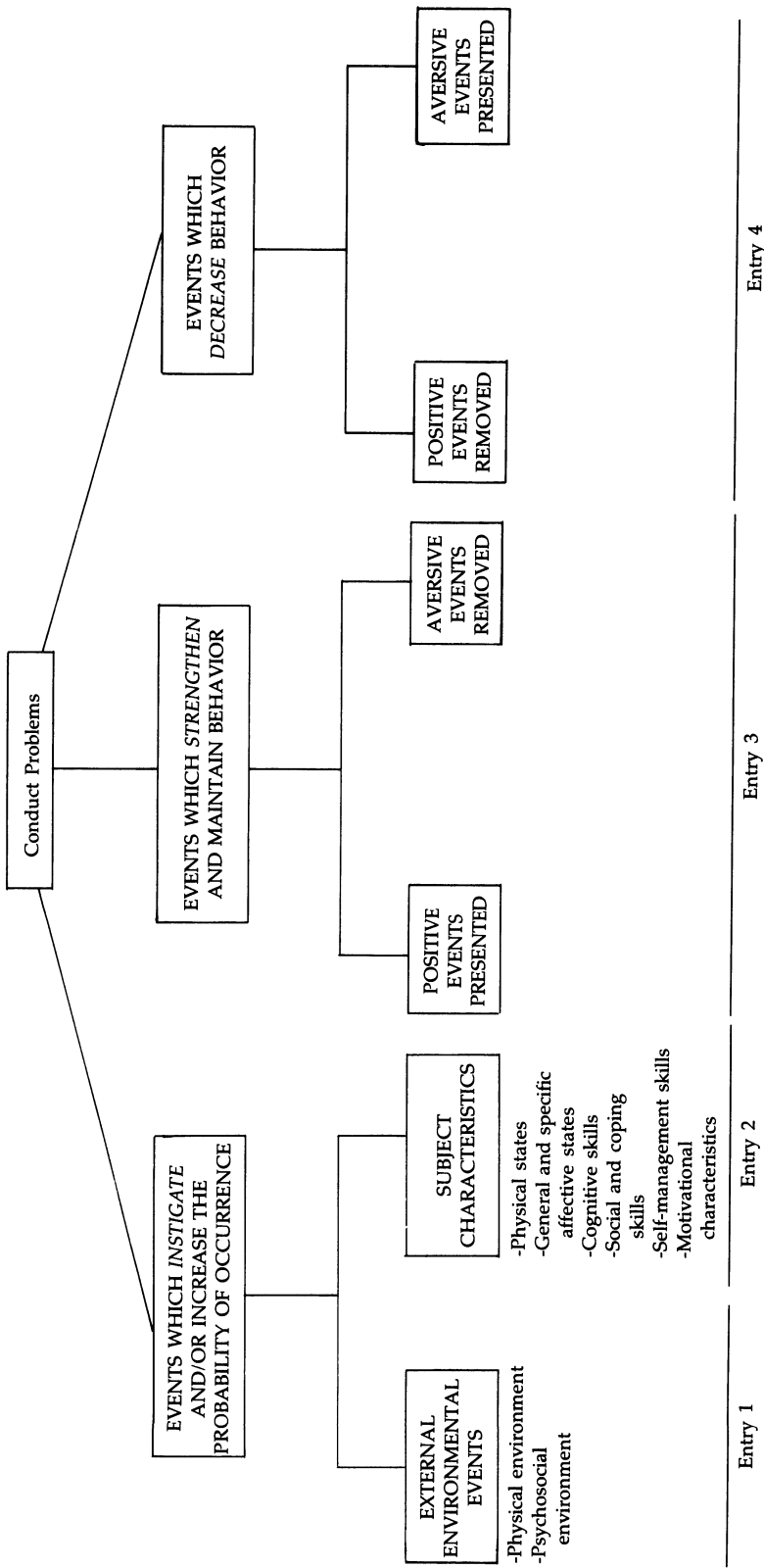


FIGURE 1. Multicomponent assessment model for conduct problems.

Entry 1

Entry 2

Entry 3

Entry 4

A final Entry 2 child characteristic of significance in understanding conduct difficulties is the child's motivational features. Knowledge of influential incentives (e.g., adult approval, peer acceptance, and having control over others), as well as of the variety and the relative effects of the aversive events that influence the child's behavior (e.g., rejection by peers, adult reprimand, and guilt), are of central importance. In illustration, a diagnostic feature of undersocialized conduct-disordered children (APA, 1980) or of the delinquent with a characterological style (Weiner, 1982) is the relative absence of remorse or guilt following antisocial behaviors. To emphasize, some Entry 2 child characteristics, such as excessive anger, may, *by their presence*, increase the likelihood of disruptive behavior. Other child characteristics, such as limited motivation to please adults, poor impulse control, absence of guilt reactions following antisocial acts, and limited conflict-resolution skills, by their *absence or low strength*, render the conduct-disordered child more vulnerable to disruptive actions under conditions of internal or external provocation.

Entry 3 of the model involves an assessment of the positive and negative reinforcement factors that may contribute to the functionality of the conduct problems. Herbert (1978), Patterson *et al.* (1975), and Bandura (1973) have provided numerous clinical and research demonstrations of the process by which social aggression is shaped by the consequences produced. Social aggression, negativism, and other conduct problems become functional in either producing positive consequences or removing or reducing negative ones.

Entry 4 directs assessment of the types of contingent aversive conditions that may serve to suppress the conduct problems, or that at least are presented in an effort to suppress these behaviors. Research has demonstrated that these contingent punishment consequences may, in fact, function to intensify or maintain the conduct problems by serving a provocation role (Bandura, 1973; Patterson *et al.*, 1975). To illustrate, Patterson and colleagues reported that, when parents of aggressive children apply such punishment as scolding, nagging, threatening, yelling, or spanking, "matters are likely to get worse. When they punish the child, he is even more likely to immediately repeat the behavior!" (p. 6). Patterson (1976) also reported that the parents of aggressive children punish them more than do the parents of nonaggressive children, even when they behave in acceptable ways.

In summary, the assessment of recurring conduct difficulties requires a consideration of a variety of environmental conditions and child characteristics that influence the repeated occurrence of problem behaviors. Additionally, assessment is made of the consequences to determine the unique function(s) that the problem behaviors may serve for that particular child.

## SELECTING SPECIFIC ASSESSMENT PROCEDURES

A variety of procedures are available for the assessment of conduct and related difficulties in children. These, described in earlier chapters, include parent and child interviews, self-reports, diagnostic play, structured parent-child

interactions, direct observation, role-play procedures, checklists and other inventories, and various personality assessment procedures, including projective techniques. (See Atkeson & Forehand, 1981, Doke & Flippo, 1983, and Patterson *et al.*, 1975, for other descriptions of these procedures and their specific applicability to the assessment of conduct disorders.)

The specific procedure(s) selected for use depends on a number of considerations, including (1) the purpose of the assessment; (2) the theoretical orientation of the clinician; (3) the resources available for assessment, and (4) when assessment is made for intervention, the agent(s) and location(s) of treatment. This array of factors that potentially influence the selection of specific assessment procedures is listed in Table 1. As noted, the theoretical orientation of the clinician (e.g., behavioral, ecological, or psychodynamic) influences the selection of specific assessment procedures regardless of the purpose of assessment. Additionally, the resources available to the clinician (e.g., junior staff and the accessibility of the client for direct observation in the home) influence the types of assessment strategies and procedures regardless of the purpose. Finally, the agent of treatment (e.g., teacher, family, or therapist) and the location of treatment (e.g., school, home, or inpatient facility) influence the assessment procedure used to determine the selection of the target behaviors, program development, and program evaluation. Illustrations of each of these variables are provided as background for the subsequent discussion of the purposes of assessment.

### *Theoretical Orientation*

As noted by Kazdin (1985), the clinician's view of normal and deviant behavior, as well as his or her therapeutic approach, strongly influences the type of psychological variables assessed; the treatment targets, objectives, and procedures selected; and thus the assessment strategies used. In illustration, a traditional behavioral clinician would assess the child's overt behaviors as these occur in specific situations. A more dynamically oriented clinician is more likely to select affective and cognitive variables for assessment. This observation emphasizes that, typically, there is no direct relationship between a child's problems and the selection of a particular assessment strategy. Rather, the child's presenting problems are likely to be formulated into the theoretical model of the clinician, and those assessment procedures are likely to be used to which the clinician is already committed.

To elaborate, a clinician with a behavioral perspective is likely to use behavioral checklists or inventories, direct behavioral observation of the child in various settings, and parent and teacher interviews in an effort to identify specific problem behaviors, interaction patterns, and other preceding and consequence conditions that may be functioning to instigate and maintain the conduct problems. This situation is illustrated by family-based intervention programs for aggressive and oppositional children derived from social learning theory (Forehand & Peed, 1979; Patterson *et al.*, 1975). Elaborate standardized direct observational procedures in home and clinic are used to provide the diagnostic data



TABLE 1. Factors Influencing the Selection of Assessment Procedures

	Purpose of assessment			
	Diagnostic classification	Target selection	Program development	Program evaluation
Theoretical orientation	X	X	X	X
Resources	X	X	X	X
Agent and location of intervention	—	X	X	X

deemed valuable in implementing and evaluating the treatment program in the home.

Other procedures, such as child personality assessment or diagnostic play therapy, would be favored by the clinician who views child psychopathology from a more psychodynamic stance (Kanfer, 1985). For example, if the assumption is made that the aggressive behavior is a symptomatic expression of unmet psychological needs, the Children's Apperception Test (CAT) (Bellak & Bellak, 1949) or a similar projective procedure may be used to identify the specific needs and conflicts that result in loss of impulse control and displaced aggression. (See Doke & Flippo, 1983, for a discussion of other projective procedures and their applicability to the assessment of conduct problems in children.)

The specific factors evaluated, and thus the assessment procedures used, may differ even among clinicians *within* a theoretical camp. In illustration, a behavioral clinician with an applied behavior analysis view that emphasizes external stimulus and consequence control factors would use repeated direct observations to identify possible stimulus-control and reinforcement variables (Entries 1, 3, and 4) that may be functionally related to the conduct problem. Another behavioral clinician with a cognitive inclination, in addition to conducting a similar clinical functional analysis, would evaluate the presence and strength of various coping skills involving interpersonal relationships, anxiety-management, and self-management variables (Entry 2).

It also is true that the *same* assessment procedure can be used differently by clinicians of different theoretical perspectives. A child or parent interview may be used by the psychodynamically oriented clinician to detect underlying conflicts and hostilities, and by the behavioral clinician as a means of gathering information about the types of stimulus conditions, interaction patterns, and consequence conditions that influence the instigation and maintenance of the conduct difficulties.

Even though many behavioral clinicians, especially those reflecting a social learning analysis of aggression, include assessment of social interaction patterns, other clinicians may adopt an even stronger ecological assessment perspective. The primary assumption guiding an ecological assessment is that a child's conduct problems result from faulty adaptation between the child and his or her environment(s). Thus, ecological assessment is a complex process involving evaluation of the child, the child's environments, and the interaction be-

tween these. A variety of assessment procedures are used in combination and may include systematic observation, behavioral checklists, rating scales, and sociometric techniques. Examples of factors that may be evaluated by means of these procedures include physical variables, such as the climate and the physical or architectural design of a particular setting, and such social-psychological variables as child-adult interactions, peer relationships, adult expectations, the skills needed to function successfully in a setting, and group and organizational factors (Swap, Prieto, & Harth, 1982).

Data supporting an ecological assessment perspective indicate that children with conduct problems have parents and larger family systems that are deviant. Patterson (1976), for example, found that both the mothers and the siblings of aggressive children engaged in more frequent aggressive behavior than those of nonaggressive children. Sandberg, Weiselberg, and Shaffer (1980) reported a significant correlation between children's conduct disorders and maternal mental distress. Additional evidence of family deviance are findings that conduct-disordered children are more likely to come from broken homes (e.g., homes characterized by divorce, death, desertion, or the father's absence) than nonconduct-disordered children (e.g., Shinn, 1978). When the family is intact, they are also likely to have parents who quarrel frequently (Robins, 1966), parents who frequently use corporal punishment and have generally harsh attitudes toward discipline (Farrington, 1978), and parents who are inconsistent with discipline (McCord, McCord, & Zola, 1959).

In summary, the problems presented by the child may have only minimal influence on the types of assessment procedures used by the clinician. Rather, the primary factor determining the assessment strategies is the specific theoretical perspectives held by the clinician relative to psychopathology and related therapeutic procedures.

## Resources

The assessment procedures used also reflect the resources available to the clinician. For example, direct observation of the child in home, school, or structured clinical setting, favored by the behavioral clinician, is a time-consuming procedure requiring well-trained observers. The Behavioral Coding System used by Patterson *et al.* (1975) in their work in the home with families of aggressive children illustrates this direct-observation assessment-procedure. During one-hour, relatively unstructured observation sessions, 29 behavioral categories are used to describe various features of child-family interactions. In this program, there are 6-10 one-hour preintervention observations, 2 one-hour observations during treatment, and 18 one-hour observations for the 12 months following the termination of treatment (Patterson, Cobb, & Ray, 1973).

As a second example, Forehand and Peed (1979) described a structured clinical observation system for the assessment of parent-child interactions during free play and parent-determined experiences. During 5- or 10-minute observation periods under each condition, three child behaviors and six parent behaviors are recorded. Again, such assessment procedures, although providing

valuable data for program development and evaluation, are rather time-consuming and expensive. For example, Forehand, Griest, and Wells (1979) reported that observers for the structured clinical observations receive at least 50 hours of training before the start of observations and weekly one-hour training sessions during actual data collection.

As an alternative, behavior-rating scales or behavioral questionnaires are self-administered and are relatively quick and easy to score and interpret, and they also provide quantitative data (Haynes, 1978). Although none is designed exclusively for the assessment of conduct disorders in children, the behavior-rating scales commonly used for this purpose include the Behavior Problem Checklist (Quay, 1977), the Revised Behavior Problem Checklist (Quay, 1983), the Bipolar Adjective Checklist (Becker, 1960), the Devereux Elementary School Behavior Rating Scale (Spivack & Swift, 1967), the Parent Attitude Test (Cowen, Huser, Beach, & Rappaport, 1970), and the Walker Problem Behavior Identification Checklist (Walker, 1970). These parent or teacher checklists may be selected because of resource limitations, even though they would not provide the type or range of assessment data needed for ideal program development and evaluation.

### *Treatment Agent and Location*

Finally, the assessment procedures selected are influenced by who provides the treatment and where the treatment is provided. To illustrate, if treatment is provided and monitored in the home or school by parents or teachers, simplified program evaluation and assessment procedures (e.g., behavior rating scales and interviews) may be selected. If the treatment is provided in a therapist's office or a specialized treatment program having resources available for more frequent and detailed monitoring of the child's behavior, more complex procedures may be selected, such as the Patterson *et al.* (1975) and the Forehand and Peed (1979) observational systems.

## PURPOSES OF ASSESSMENT

The types of assessment procedures selected also depend on the purpose(s) of the evaluation. As shown in Table 1, assessment procedures are selected for the purposes of (1) diagnosis and classification; (2) the identification of treatment targets; (3) program development; and (4) program evaluation.

### *Diagnosis and Classification*

As noted earlier, a number of classification systems include various categories of psychopathology in which conduct difficulties are either central features of a disorder or symptoms of a more basic condition or disorder. This section provides illustrations of the usefulness of formal diagnosis, describes various classification systems that include syndrome patterns or disorders involving

conduct difficulties, and discusses the types of assessment procedures available for obtaining the information needed for differential diagnosis.

### *Usefulness of Formal Diagnosis*

Although some clinicians, especially those with a behavioral orientation, are apt to eschew formal diagnosis or classification and to focus instead on direct behavioral assessment and treatment of specific conduct problems in particular situations, this approach may cause problems in individual cases. As emphasized by Kazdin (1983), children with similar presenting problems (e.g., aggression) may differ widely in prognosis and in responsiveness to behavioral interventions, depending on factors other than the current presenting problems. For example, a number of writers (e.g., McAuley, 1982; Plapp, 1983; Weiner, 1982) have indicated that the behavior problems of children with a long-standing conduct disorder are more difficult to manage and treat successfully than the conduct problems presented by children with other mental disorders as defined by the DSM-III. As another illustration, the inefficiency of extinction and differential attention procedures in influencing negative behaviors of oppositional children has been reported (Herbert, Pinkson, Hayden, Sajwaj, Pinkston, Cordua, & Jackson, 1973; Hersen & Barlow, 1976). Being sensitive during assessment to the total array of children's problems, and to the differential diagnoses that these may produce, may thus be useful both in the development of realistic program objectives and in the selection of effective treatment procedures.

In fact, the relationship between conduct problems and a range of other psychiatric conditions that involve major problems of affect, cognition, and perception suggests that psychological assessment and treatment be closely interfaced with psychiatric assessment and treatment approaches. Such a differential-diagnostic-assessment attitude may prove quite useful in individual cases, as diagnoses at times do imply treatment (Taylor, 1983). In some instances, the successful medical treatment of a syndrome pattern such as depression may have a significant impact on a child's conduct problems. This situation was illustrated by Puig-Antich (1982) who reported that, following successful drug treatment (with imipramine) of major depressive disorders in prepubertal boys who also presented conduct problems, the conduct problems also abated in most cases. In other instances, improvement may be optimized by a combination of drug and psychological therapies. This situation was illustrated by the successful inpatient treatment of an adolescent with problems of seizure activity and concomitant aggressive outbursts. A combination of antiseizure medication (carbamazepine) and behavior therapy procedures resulted in successful control of both the seizures and the related conduct problems (Rappoport, Sonis, Fialkov, Matson, & Kazdin, 1983).

### *Types of Diagnostic and Classification Systems*

If assessment is being conducted to place the child in an appropriate category within a classification system, the type of diagnostic or classification scheme

followed would influence the selection of the assessment procedures. Both empirically based and clinically based classification systems are described to illustrate this relationship.

*Empirically Based Systems.* One empirically derived classification system of child psychopathology was described by Quay (1977, 1979). If the clinician favors this classification system, the Behavior Problem Checklist (Quay, 1977) and the Revised Behavior Problem Checklist (Quay, 1983) are appropriate assessment techniques. In the original and the revised checklists, two patterns of deviant behavior described in this factor-analytic-based system involve conduct problems, that is, conduct disorder and socialized aggression. The characteristics of a child classified as conduct-disordered include fighting, temper tantrums, disobedience, arguing, bullying others, not sharing, uncooperativeness, disruptiveness, negativism, teasing others, selfishness, not being liked by others, and blaming others. Socialized aggression includes the characteristics of having bad company, stealing in the company of others, loyalty to delinquent friends, belonging to a gang, staying out late at night, and truancy from home. Again, the child may be diagnosed as exhibiting one of these disorders on the basis of scores obtained on the Revised Behavior Problem Checklist, a 3-point rating scale containing 89 problem behaviors. The checklist is typically filled out by parents or teachers.

*Clinically Based Systems.* In contrast to the empirically based system are those that have been derived from clinical experiences. Two such systems are described. Initial attention is provided the DSM-III (APA, 1980), the most formal and most widely used system in this country. Additionally, as a significant percentage of conduct difficulties among adolescents involve illegal acts of delinquency, the psychological disturbance categories suggested by Weiner (1982) are included, as these provide additional diagnostic distinctions.

1. *DSM-III: Conduct Disorder.* In the DSM-III system, the two disorders in which conduct difficulties are predominant features are conduct disorder and oppositional disorder. The major diagnostic feature of conduct disorder is a repetitive and persistent pattern of behavior of at least six months' duration that violates either the basic rights of others or major age-appropriate societal norms or rules. Four specific subtypes are included with major differential diagnostic criteria for each. In the two aggressive conduct disorders, there is either physical violence against persons or property, or theft outside the home involving confrontation with the victim. In contrast, in the two nonaggressive conduct disorders, there is evidence of any one of the following: chronic violation of important age-appropriate and reasonable rules in home or school settings, repeated running away from home overnight, persistent and serious lying in the home and other settings, and stealing that does not involve confrontation with a victim.

Children or adolescents with either the aggressive or the nonaggressive pattern of conduct disorder are further diagnosed into the subtypes of undersocialized or socialized on the basis of the presence or absence of social bonds. The criterion for this differential diagnosis is the presence of no more than one of the following indications of social attachment for the undersocialized subtypes and the presence of at least two for the socialized subtypes: has peer-group friendships (one or more) of over six months' duration; even when no immedi-

ate advantage is likely, extends himself or herself for others; shows evidence of experiencing guilt or remorse when such a reaction is appropriate; does not blame or inform on companions; and shows concern for the welfare of friends or companions.

2. *DSM-III: Oppositional Disorder.* Within the DSM-III, the central diagnostic criterion for the oppositional disorder is a pattern of at least six months' duration of disobedience, negativism, and provocative opposition to authority figures. This pattern is manifested by at least two of the following: violation of minor rules, temper tantrums, argumentativeness, provocative behavior, or stubbornness. Further, (1) these behaviors have an onset after age 3 and before age 18; (2) the child does not violate the basic rights of others or major age-appropriate societal norms or rules (no behaviors such as persistent lying, truancy, stealing, physical aggression, or vandalism); and (3) the problem behaviors are not symptoms of another mental disorder, such as schizophrenia and pervasive developmental disorder. Thus, a differential diagnosis is made between oppositional disorder and conduct disorder on the basis of the types and severity of the conduct problems present.

To arrive at a differential diagnosis based on the DSM-III, the clinician must select assessment procedures that would provide both factual data (e.g., "Problem is of six months' duration"; "Child does not inform on companions" and other information that would produce reliable and valid inferences about the presence or absence of affective, cognitive, and motivational variables (e.g., "Expresses guilt or remorse"; "Shows concern for welfare of others"). Parent and child interviews, behavioral checklists, and personality assessment are likely to be selected in obtaining the diagnostic information required.

3. *Weiner's Psychological Disturbance.* Although not presenting a formal classification system, Weiner (1982) suggested some important diagnostic distinctions of value in the assessment of children and adolescents who engage in repetitive antisocial acts. The first distinction is made between the *sociological delinquent* and youngsters whose conduct difficulties reflect underlying *psychological problems*. Sociological delinquents have few psychological problems and are well-integrated members of a delinquent subculture that endorses antisocial standards of conduct. They are likely to exhibit conduct difficulties in response to social influences rather than personal psychological problems. These adolescents rarely commit crimes by themselves and seldom keep any illegal act from their peers. During their early life, these conduct-disordered youth have typically enjoyed good family relationships that have provided them the basis for forming interpersonal attachments and for the development of judgment and self-control. This category is similar to the DSM-III socialized aggressive conduct disorder.

In contrast, Weiner (1975) suggested that conduct difficulties reflecting psychological problems are of three different patterns. The first pattern, *characterological style*, is defined by chronically irresponsible, aggressive, and inconsiderate behavior reflecting a primary asocial personality. Such youth are usually loners with no group membership or loyalties. According to Weiner, their conduct difficulties reflect the translation of aggressive, acquisitive, and pleasure-

seeking impulses into immediate action, with minimal concern about how others may suffer in the process. Antisocial acts occur to express aggression, to satisfy a whim, or to obtain something the youth wants instead of in response to group pressure or for peer approval and acceptance. In diagnosis, the clinician would assess the presence of an underdeveloped conscience and related impulse control and motivational features, along with the basic inability to identify with other people. This assessment could be accomplished through diagnostic interviews and the use of personality assessment procedures.

In a second pattern, the delinquent acts represent *neurotic symptoms*. The antisocial acts of youth who are not well-integrated members of a deviant subculture represent an indirect expression of underlying personal concerns. Typically, the antisocial behaviors are in sharp contrast with previous life patterns of conformity and of being well controlled. As suggested by Weiner (1982):

As a general principle, the less continuity there appears to be in a delinquent youngster's behavior and the more his or her current delinquency diverges from a past history of model conduct, the more reason there is to consider him or her to be a neurotic delinquent. (p. 411)

The antisocial acts follow recurring rejections, losses, or disappointments that intensify the youngster's personal need for recognition and attention. As these needs underlying the antisocial acts can be met by others only if detected, the youngster invariably manages to be caught. In other youth, the delinquency may represent an appeal for help with other problems, such as depression, that result from feeling lonely, isolated, discouraged, or helpless. Both interviews and personality assessment procedures are useful in identifying the underlying affective and cognitive factors that are presumed to result in the symptomatic conduct problems.

A third pattern of antisocial conduct described by Weiner (1982) is symptomatic of "*psychotic or organic* impairments of judgement, impulse control, and other integrative functions of the personality" (p. 391). Thus, in a small, but clinically significant, number of cases, conduct difficulties coexist with psychotic and organic behavior disorders. In youngsters with schizophrenia, thought and perceptual disorders impair judgment about the consequences of their behavior. These characteristics, combined with those of impaired impulse control, may result in antisocial behavior. Finally, youngsters with temporal lobe epilepsy may engage in episodes of angry, assaultive, antisocial behavior. Typically, the person has little or no memory of what has occurred and expresses severe regret for any damage or disturbance caused. Because of the potential contributions of organic factors, both medical and psychological assessment procedures should be used. A mental status examination, a neurological examination, interviews, and personality assessment provide the crucial differential diagnostic data.

### *Identifying Treatment Targets*

As noted, seldom does a child present a single conduct problem. Rather, children with conduct difficulties most typically present multiple concerns. Which, if any, of the presenting problems identified during assessment should

be selected as the primary treatment target(s)? This clinical decision is critically important, as it influences the treatment procedures selected, the treatment objectives, the location and agent of treatment, and the procedures selected to assess intervention effectiveness in modifying the target. In describing the nature of the clinician's task in target selection, Kanfer (1985) noted:

Each client presents the clinician anew with the fundamental task of deciding on a focus for the most effective intervention. In moving from the presenting complaint to a treatment plan, the clinician uses diagnostic or assessment procedures to define the problem situation. Inferences are then made about the major determinants of the problematic situation and remedial actions that would alter it in a favorable direction. In this sequence, target selection is a critical transition point at which the clinician decides on an initial course of action. (p. 7)

Because of the multiple presenting problems, as well as the multiple factors that may be influencing their occurrence, their relative intensity, and their chronicity, the clinician's task of selecting treatment targets is magnified in the assessment of conduct problem children. What guidelines should be used in target selection? Should the clinician select the problem that is most aversive to the social environment? That creates the most difficulty for the child? That is assumed to covary with other problem or prosocial behaviors? (Kanfer, 1985, suggested a number of other possible considerations and should be consulted by the interested reader.)

Should the problem behavior be targeted directly or should some other problem area that is presumed to be influencing the presenting problem be selected as the focus of intervention? For some clinicians, this concern is minimized, as target selection is relatively straightforward and highly correlated with the theoretical orientation of the clinician. If the conduct difficulties are viewed as symptoms of an underlying disorder, this more central condition becomes the primary treatment target. In illustration, if the youngster presenting conduct problems is diagnosed as depressed, the treatment target may be the depression, which is assumed to influence the symptomatic aggressive reactions (e.g., Puig-Antich, 1982). Or if the conduct problems are viewed as reflecting the absence of crucial personal features of the child, these deficit characteristics are selected for treatment. Foreman (1980), for example, targeted deficit cognitive coping skills in the treatment of aggressive youngsters. In contrast, programs for socially aggressive and oppositional children (e.g., Patterson *et al.*, 1975) select the specific aggressive or oppositional behavior as the primary target of intervention. Typically, a time-out procedure is used to punish these deviant behaviors. However, even in these programs, there is disagreement among clinicians about the specific alternative child behaviors to select as the target for strengthening. Most have settled on a social behavior as this treatment target. As an exception, Wahler and Fox (1980) reported most improvement in children identified as severely oppositional and aggressive following periods of time in which they were reinforced for engaging in solitary toy play.

In summary, the clinician is faced during assessment with the selection of treatment targets. As there are currently no commonly accepted conventions to guide the clinician in this endeavor, the theoretical orientation of the clinician



becomes the major variable influencing target selection. A recent series of articles (Kratochwill, 1985) provides thoughtful discussion of the assessment issues involved and is recommended for the interested reader.

### *Program Development*

In most instances, the primary and most critical assessment activity is obtaining information for formulating a treatment program. Although there may be considerable overlap, the types of information needed to formulate an intervention program differ in various ways from that used to establish a formal diagnosis. In illustration, the Revised Behavior Problem Checklist (Quay, 1983) may result in a classification of socialized aggression. However, such diagnostic information may provide little indication of the specific variables that should be considered in developing and implementing a treatment program for a specific child.

In conducting an assessment for program development, two major themes should guide the clinician's activities. First, the assessment should be client-specific, that is, designed to identify and understand critical factors related to the problem behaviors in individual children. One child, in illustration, may act aggressively in an impulsive manner when angry or overly anxious, whereas another child's aggression may be more deliberate and goal-directed. Second, when attempting to understand the child's acting-out difficulties, the clinician simultaneously should pinpoint those specific coping skills and related cognitive, emotional, and motivational supports that the child will need for successful social and interpersonal functioning. The critical assessment questions are "How can the conduct problem behaviors be replaced with more socially appropriate ones that are central to the child's present and future adjustment in naturalistic settings?" and "How can the family and school settings be modified to ensure the development and maintenance of these changes?"

In addressing these assessment questions, it is important to keep in mind that, as is true of most clinical problems, specific conduct problems seldom occur in isolation (Kanfer & Grimm, 1977; Kazdin, 1985). Rather, temper tantrums, aggression, noncompliance, high rates of annoying behaviors such as yelling or making negative demands, violation of community rules, and destructiveness occur in clusters. As noted by Kazdin (1985), "Selection of any particular target behavior may completely ignore the larger syndrome of which it is a part" (p. 37). Thus, it is necessary to assess the larger constellation of problems that are present, along with the severity and chronicity of each. Assessment of these latter two dimensions becomes important, as specific intervention tactics may prove valuable with mild forms of aggression or oppositional behaviors but may be of minimal use with more severe problems of long duration (Gardner & Cole, 1984; Weiner, 1982).

It is also valuable in more severe and chronic cases to evaluate the potential effects of broader environmental features, as emphasized by an ecological assessment model. As noted, the primary purpose of ecological assessment is to pinpoint faulty child-environment interactions or variables as a basis for inter-

vention. Thus, ecological assessment and treatment are closely linked. If, for example, assessment identifies teacher expectations, curriculum level, and the physical setting as contributing to a child's acting-out behaviors in the classroom, intervention would be designed to modify these.

Perhaps the most well-known example of an ecologically based intervention program is Project Re-ED, which provides short-term residential treatment for mildly to moderately disturbed preadolescents (Hobbs, 1982). In this program, the child is viewed as an integral part of a social system, that is, an ecological unit consisting of the child and his or her family, school, and neighborhood. Rather than focusing on changing the child, each component of the system is assessed and, when necessary, modified to ensure that it will function smoothly with respect to the requirements of the other components. The term *discordance*, rather than *disorder* or *disturbance*, is used to emphasize the interaction between a child's behavior difficulties and the expectations of others within the ecological unit (Lewis, 1970). Depending on the assessment data obtained, discordance may be reduced either by teaching the child competency skills so that he or she meets more expectations, or by modifying expectations within the ecological unit, or, typically, by both. In illustration, if it is discovered during assessment that the child's parents have particularly strict and harsh child-rearing attitudes, the child may be taught skills of responding more effectively to parental expectations, and the parents may be provided a parent-training course designed to change their behaviors, attitudes, and experiences with the target child.

Assessment data obtained from any of the array of procedures available to the clinician are used to develop hypotheses about the current environmental conditions and the child characteristics that increase the likelihood that disruptive behaviors will occur (e.g., adult reprimands, taunts from peers, an unmet need for attention, or limited coping skills). Additionally, hunches are developed about the functions served by these behaviors (e.g., oppositional behavior removes aversive parental demands and produces peer approval, or delinquent acts attract desired social attention). Thus, hypotheses are developed about factors in each of the entry points presented in Figure 1, as each represents a potential target of program intervention.

Following the development of a complex of hypotheses concerning the factors influential in producing the conduct problems, the clinician translates these hypothesized contributing factors into program implications and then into specific intervention procedures. In illustration, if it is assumed that an adolescent engages in antisocial acts as a means of obtaining desired parental and peer attention, this hypothesis translates into the following program implications: (1) minimize adult and peer social attention following antisocial behavior; (2) provide frequent parental and peer attention following prosocial behaviors; and (3) provide specific skills training to ensure that the adolescent will have more appropriate attention-getting skills. These program implications may translate into specific intervention approaches involving (1) an extinction procedure; (2) differential reinforcement procedures; and (3) a social-skills-training program.

As a second example, the hypothesis may be developed that at least one function served by the highly disruptive behavior of an adolescent toward a

specific math teacher is that it produces negative reactions from the teacher and other staff. A subsequent power struggle typically results in the adolescent's being dismissed from the class and occasionally suspended from school. These observations could be translated into program implications, and related intervention procedures could be aimed at (1) removing or reducing the negative reactions of the teacher and other staff; (2) increasing the reinforcement value of the math class and the teacher; and (3) teaching the adolescent other academic and social skills that can be used to exert more appropriate personal control over the teacher and other adults in authority roles.

To summarize, the steps involved in the assessment and program development process are as follows:

*Step 1.* Gather assessment data in all entries of Figure 1.

*Step 2.* Develop hypotheses concerning influential variables at each entry point.

*Step 3.* Translate hypotheses into program implications.

*Step 4.* Select specific intervention procedures and combine these into a comprehensive therapy program.

*Step 5.* Following the initiation of the program, monitor the child's progress and modify the program as needed. Add generalization and maintenance approaches as therapy goals are being attained.

### *Program Evaluation*

The final purpose of assessment is evaluating the effectiveness of the approaches followed in the treatment of a child's conduct difficulties. This assessment may be used to evaluate treatment progress as well as treatment outcome at termination and follow-up. In most instances, the assessment procedures selected duplicate those used before intervention to establish baseline or pre-treatment status. In illustration, the direct-observation Behavioral Coding System used by Patterson *et al.* (1975) to obtain diagnostic information before home-based intervention is repeated during treatment and again following the termination of treatment. The effectiveness of the treatment is thus reflected in the changes in the child and family behaviors measured.

Although other, more indirect methods of obtaining posttreatment data raise reliability and validity concerns, questionnaires are commonly used to assess treatment outcome (Atkeson & Forehand, 1981). Also, a questionnaire such as the Parent Attitude Scale (Cowen *et al.*, 1970) is useful as a measure of parental satisfaction with the treatment results. The use of this and similar procedures to validate the social importance of treatment effects is viewed by an increasing number of clinicians as an essential assessment component of intervention efforts. Kazdin (1977) suggested that the social validation of treatment effects can be assessed by the methods of *social comparison* and *subjective evaluation*. In the social comparison method, measures of the behavior of conduct-disordered children before and after treatment are compared to those of more typical peers who do not present problems. If, following treatment, the behavior of conduct-disordered children more closely approximates that of non-conduct-

disordered children, the treatment program is validated as producing socially significant changes.

As illustrated previously, the subjective evaluation method involves asking significant individuals in the child's environment (e.g., parents, teachers, and counselors) to provide a subjective impression of the significance of any perceived behavior change. If significant others in the child's environment perceive posttreatment change as being valuable, the treatment is thus socially validated. In addition to questionnaires such as the Parent Attitude Scale, interviews may be used to assess changes in the perceptions of those in the child's environment.

## CONCLUSIONS

Conduct problems in children and adolescents represent one of the more frequently occurring forms of psychopathology observed in home, school, and broader community settings. The problems vary in severity and coexist with, or represent symptoms of, a range of other childhood disorders. As a result, a useful assessment of conduct problems requires multiple diagnostic procedures and considerable clinical acumen in the interpretation of the assessment data. As there are currently no empirically validated assessment or treatment packages applicable to all children displaying conduct difficulties, the clinician will continue to be significantly influenced by his or her own views of psychopathology and related therapeutic procedures in the selection of specific assessment procedures, treatment targets, treatment procedures, and outcome measures.

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# 12      *Assessment of Attention Deficit Disorder and Hyperactivity*

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Of all the behavioral disturbances in children, perhaps none is so intriguing to clinicians, educators, and parents alike as is the disorder called *attention deficit disorder* (ADD), often referred to in the past as *hyperactivity* or *hyperkinesis*. This disorder represents one of the most common reasons for referral to school psychologists and/or child guidance and mental health clinics and has one of the longest histories of research and study in the area of childhood behavior disorders. ADD is typically viewed as a developmental disorder of social conduct and self-control that involves deficits in attention and academic achievement and that involves a long-term course that may begin as early as infancy or early childhood and continue through adolescence (e.g., Barkley, 1981a, 1983; Friman & Christophersen, 1983).

The primary behavioral characteristics associated with ADD are inattention (e.g., being easily distractable, not appearing to listen, and failing to finish things) and impulsivity (e.g., acting before thinking, excessive shifting from one activity to another, and difficulty awaiting one's turn in a group situation), occurring before age 7, having a duration of at least six months, and not being due to severe or profound mental retardation, schizophrenia, or affective disorders (American Psychiatric Association, 1980). In addition, we may observe these children demonstrating aggression, restlessness, a high activity level, and difficulties in structured academic and nonacademic situations.

In this chapter, we review the literature on the diagnosis, classification, and assessment of attention deficit disorder. We also review the prevalence and incidence data in this area as well as present an overview of the etiological positions concerning this disorder.

## NORMATIVE AND PREVALENCE DATA

### *Normative Data*

Recent epidemiological studies have reported prevalence rates indicating that 3%–20% of all school-aged children in the United States may be regarded as

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having attention deficit disorder. This wide range of prevalence estimates appears to be a function of the variety of diagnostic criteria and the degree of methodological rigor used by the researchers (Ross & Ross, 1982). One of the more frequently reported prevalence estimates (e.g., Barkley, 1983; Hartlage & Telzrow, 1982) suggests that 3%–5% of school-aged children may have attention deficit disorder—or approximately one child in every classroom. Furthermore, it has been estimated that at least 50% of those children referred to child guidance clinics for evaluation and treatment are also diagnosed as having ADD or hyperactivity (Stewart, Cummings, Singer, & deBlois, 1981). Clearly, hyperactivity and/or attention deficit disorder is one of the most frequently occurring behavior disorders in children.<sup>1</sup>

The behaviors of preschool ADD/hyperactive children that result in the greatest difficulties for parents are those involving increased mobility, an apparent sense of fearlessness, aggressive and immature interactions with other children, and negative attention-getting behaviors (Ross & Ross, 1982). During the elementary-school years, domineering and immature behaviors are present in these children—behaviors that tend to undermine the development of adaptive and successful relationships. In the classroom, these children exhibit disruptive behaviors and academic underachievement, as well as such antisocial behaviors as lying and stealing. Hyperactive children during these years are also more impulsive, field-dependent, and constricted in the control of their attention (i.e., having selective inattention) than normal same-age peers of equal intelligence (e.g., Campbell, Douglas, & Morganstern, 1971), and they are frequently viewed as sad and depressed, with concomitant low self-esteem that may result from parental rejection (Ament, 1974).

The teenage years are perhaps the most difficult period for those children whose hyperactive behaviors and attentional difficulties persist into adolescence. Despite a decline in gross-motor overactivity, ADD/hyperactive children continue to exhibit a poor self-image, a lack of social skills, academic underachievement, inattention, restlessness, and frequent engagement in impulsive and antisocial behaviors (e.g., Hechtman & Weiss, 1983; Ross & Ross, 1982). In addition, ADD/hyperactive adolescents are more likely to abuse alcohol than nonhyperactive, learning-disabled adolescents (e.g., Blouin, Bornstein, & Trites, 1978). Rebellious and antiauthoritarian attitudes are also common in these youngsters (e.g., Mendelson, Johnson, & Stewart, 1971; Minde, Weiss, & Mendelson, 1972), and they show truancy problems and quit school more frequently than “normal” adolescents (e.g., Ross & Ross, 1982).

In adulthood, individuals diagnosed as ADD/hyperactive as children tend to show an improvement in activity level and attention, but they still have more difficulty concentrating and are more restless than “normal” adults. Barkley (1981a), for example, posited that some difficulties are lessened in adulthood partially because these individuals are out of the structured school setting and

<sup>1</sup>Because of the confusion in the literature with the interchanging of the terms *hyperactivity* and *ADD*, we will use the term *ADD/hyperactivity* or *ADD/hyperactive* throughout this chapter to summarize the etiological research and scholarly discussions on “attention deficit disorder” and “hyperactivity.” In those instances where discussions center specifically on the child with “nonhyperactive” attention deficit disorder, we will use the term *ADD/nonhyperactive*.



are able to move into and/or to select environments that are more tolerant of their behavior. Nevertheless, problems often persist, such as alcohol abuse, depression, problems with the law, and lower-than-expected socioeconomic status (e.g., Borland & Heckman, 1976).

Therefore, the overall view of ADD/hyperactivity as a long-term behavior disorder involving difficulties in concentration and inattention, social conduct, impulse control, and overactivity appears to be well supported—with variations of these difficulties continuing into adulthood.

### *Prevalence Rates and Sex Differences*

The interaction of prevalence rates and sex is thought to be important primarily because it may provide support for a sex-linked genetic etiological component of ADD/hyperactivity, although it is generally recognized at this time that it is difficult to tease out the relative effects of genetic and environmental influences on many behavior problems. Prevalence estimates consistently suggest that ADD/hyperactivity occurs more frequently in boys than in girls, with ratios ranging from 3:1 to 9:1 (e.g., Safer & Allen, 1976; Trites, Dugas, Lynch, & Ferguson, 1979).

Unfortunately, many of the prevalence studies in this area have either used restricted samples of boys or included so few girls as to preclude meaningful statistical comparisons (Whalen, 1983). Speculation about differences among the antecedents, concomitants, and consequences of ADD/hyperactivity in males and females has been stimulated by such research as that conducted by Sandoval, Lambert, and Sassone (1980). These researchers reported that boys are six to eight times more frequently diagnosed as hyperactive than girls, and that the estimated rates parallel one another across grade levels. There is one interesting exception, however, to this finding: girls tend to demonstrate a peak prevalence rate during kindergarten. As a possible explanation, Sandoval *et al.* (1980) concluded that this finding reflects either an early appearance of hyperactivity in girls or, generally, a superior adaptability of girls over time to the demands of the classroom setting. Sandoval *et al.* were quick to caution that these comments are tentative and must be confirmed through longitudinal studies. However, as a partial confirmation of the Sandoval *et al.* view, Glow (1981) reported that, by increasing the stringency of the diagnostic criteria for ADD/hyperactivity, the ratio of boys to girls becomes even *more* disparate. As the tightening of criteria has the effect of focusing attention on more severe behavior problems, these findings are consistent with reports that ADD/hyperactive girls engage in fewer deviant behaviors, that their behavior is more highly associated with positive variables, and that they elicit less social censure than ADD/hyperactive boys (e.g., Battle & Lacey, 1972; Pelham, 1980; Prinz & Loney, 1974).

### *Socioeconomic Status*

As a result of several issues raised in the literature, consideration has been given to the possible relationship between ADD/hyperactivity and socioeconomic status (SES). For example, one issue that has been raised involves the

position that, to some extent, the diagnosis of ADD/hyperactivity has been differentially applied as a means of suppressing the behavior of lower-SES children (e.g., Conrad, 1975). This position suggests that the culturally different patterns of behavior displayed by these children are likely to be interpreted as deviant and subsequently as "maladjusted" behavior to be diagnosed and medically or psychologically treated.

A second issue that has been raised relates to the view that lower parental SES is more likely than higher parental SES to be associated with inferior pre-, peri-, and postnatal care of and malnutrition in children (e.g., Ross & Ross, 1982). Such early developmental factors have been linked to certain difficulties in CNS functioning, which, in turn, may be related to ADD/hyperactivity. Assuming the accuracy of this relationship, one might therefore predict higher prevalence rates for ADD/hyperactivity among lower than among higher-SES groups (e.g., Ross & Ross, 1982). The prevalence and incidence literature, however, has not supported this view. For example, Campbell and Redfering (1979) reported that environmental and demographic variables such as race, educational level, birth order, parental age, number of siblings, marital status, method of discipline, and income level were not significantly related to teacher ratings of ADD/hyperactivity in children. Bosco and Robin (1980) compared the SES levels of both mothers and fathers of nonmedicated hyperkinetic, nonhyperkinetic, and hyperkinetic children treated with stimulant medication and found only very small differences between these parent groups. They also reported that the single most powerful social status indicator, parental occupation, failed to reflect SES differences in the diagnosis of hyperkinesis.

In contrast to the aforementioned findings, many investigators have reported both higher incidence and increased severity of ADD/hyperactivity symptoms among lower-SES groups. For example, in a prevalence study in Ottawa, Canada, Trites (1979) found higher prevalence rates in poorer economic areas of the city—independent of population density. Trites suggested that as many as one of every four children in the poorer economic areas could be labeled as ADD/hyperactive. The contradictory nature of these findings and of those reported above may be due to the criteria used to define social disadvantage. For example, when the criteria used to define SES were expanded to include not only level of income and education, but also such conditions as overcrowding, maternal mental distress, and broken homes, a significant relationship was observed between SES and ADD/hyperactivity (Sandberg, Wieselberg, & Shaffer, 1980).

## THEORIES OF ETIOLOGY

### *Neurological Factors*

Neurological factors have long been thought to play a primary role in the etiology of ADD/hyperactivity. The earliest discussions of ADD/hyperactivity (e.g., Still, 1902; Strecker & Ebaugh, 1924) attributed this condition to brain damage that arises from a multiplicity of sources, including prenatal and per-

inatal difficulties, physical trauma, and severe illnesses. Behavioral similarities that have been observed in adults, children, and primates with injuries specific to the prefrontal cortex, as well as in ADD children, include distractibility, inattention, restlessness, and impairment in rule-governed behavior (e.g., Barkley, 1981a, 1983, for a summary). Although these similarities in behavior are quite compelling, empirical efforts (e.g., Stewart & Olds, 1973) to demonstrate the presence of brain damage in ADD/hyperactive children have yielded little support for this theoretical position. Therefore, these studies suggest that hyperactivity is not a characteristic behavioral manifestation of brain damage. In fact, Stewart and Olds (1973) reported that, of those children referred for hyperactivity, less than 10% exhibited histories suggestive of any brain injury.

Another theoretical view that advocates a neurological basis to ADD/hyperactivity involves the notion of *minimal brain dysfunction* (MBD). This view hypothesizes that ADD/hyperactivity is related to neurotransmitter abnormalities (e.g., Shaywitz, Cohen, & Shaywitz, 1978; Wender, 1978).

Wender (1978) hypothesized that a deficiency in the functioning of dopamine may be etiologically related to ADD. Irregular metabolism of the class of neurotransmitters known as monoamines (dopamine, norepinephrine, and serotonin) has been implicated in the causation of a number of clinical disorders, including hyperactivity, childhood autism, schizophrenia, and bipolar affective disorders. The ADD/hyperactivity formulation presented above is based primarily on the long-standing finding that amphetamine stimulant drugs (e.g., methylphenidate, *d*-amphetamine, and pemoline) improve behavior in ADD/hyperactive children and remediate deficient dopaminergic activity (e.g., Solanto, 1984; Wender, 1971). In addition, it has been shown that hyperactive behavior may be induced in animals through the experimental depletion of brain dopamine (e.g., Shaywitz *et al.*, 1978). Unfortunately, the optimum procedure for clarifying the role of monoaminergic functioning in ADD/hyperactivity involves the currently difficult task of measuring neurotransmitter levels in the human brain. There is also confounding evidence regarding this MBD hypothesis that suggests that, although altered neurotransmitter metabolism may influence behavior, changes in behavior may also modify neurotransmitter metabolism (Cohen & Young, 1977). For example, Whalen (1983) pointed out that ADD/hyperactive children are likely to experience unusually high levels of stress because of interpersonal difficulties, and it is therefore conceivable that neurotransmitter dysfunction is a consequence instead of a precursor of those behaviors that constitute the diagnosis of ADD/hyperactivity.

Another view regarding ADD/hyperactivity—a view that has not been supported in the literature—involves the underarousal of the reticular activating system (e.g., Satterfield, Cantwell, Lesser, & Podosin, 1972; Satterfield & Dawson, 1971). In this theory, it has been proposed that the underarousal of the reticular system results in decreased control by children of their motor and sensory functions. This view, however, was questioned a few years later by Satterfield and his colleagues (e.g., Satterfield, Atoian, Brashers, Burleigh, & Dawson, 1974b), although Ferguson and Pappas (1979) concluded that there was some support for this hypothesis.

Speculation regarding the contribution of other neurological factors to the development of ADD/hyperactivity has not met with success—especially when attempts have been made to differentiate “normal” children from ADD/hyperactive children on these factors (Barkley, 1976, 1983; Solanto, 1984). Even studies involving electroencephalographic (EEG) and psychophysiological variables have failed to consistently differentiate “normal” children from ADD/hyperactive children (e.g., Barkley, 1977, 1981). However, research into the neurological and/or neurophysiological basis of ADD/hyperactivity continues, as these factors are viewed by many researchers as the primary cause of this childhood behavior disorder.

### *Familial-Genetic Influences*

Research efforts to specify possible familial-genetic contributions to ADD/hyperactivity have been very informative in recent years. Three types of research methodologies typify this area of investigation: family studies, twin studies, and adoption studies. Examination of the prevalence of childhood hyperactivity and other types of psychopathology in first- and second-degree relatives of hyperactive children has generally been interpreted as suggesting a genetic component in this disorder. For example, in a study by Morrison and Stewart (1971), retrospective reports by parents showed a significantly higher prevalence of ADD/hyperactivity in the parents of ADD/hyperactive children than in the parents of “normal” control children—especially among biological fathers, who exhibited higher rates of alcoholism and antisocial behavior (Morrison & Stewart, 1971). Cantwell (1978) also found a link between childhood hyperactivity and diagnosed hysteria in the biological mothers of the Morrison and Stewart hyperactive children.

Methodological difficulties in the Morrison and Stewart study restricted many of the interpretations and conclusions. For example, experimenter bias in this study may have influenced the retrospective diagnosis of childhood hyperactivity of parents, as the interviewers were not blind to a child’s diagnosis. The use of “normal” rather than “psychiatric” control groups precluded a determination of whether the observed familial links were specific to ADD/hyperactivity or were generalizable to a broad band of childhood behavioral disorders. A review of more recent familial-genetic influence studies—designed to correct for the earlier methodological shortcomings—shows that 40%–50% of those parents of heterogeneous groups of children referred to a psychiatric clinic exhibited diagnosable psychiatric disturbances themselves (Whalen, 1983). This evidence seems to argue against the specificity of a relationship between parental psychiatric disturbance and childhood hyperactivity.

Twin studies are based on the premise that a genetic component for ADD/hyperactivity is supported if there is a higher concordance rate among monozygotic twins than among dizygotic twins with respect to the characteristics of ADD/hyperactivity. Several studies have reported significantly higher intraclass correlations for activity level in monozygotic than in same-sex dizygotic twins (e.g., Matheny & Dolan, 1980; Scarr, 1966; Willerman, 1973).

However, the tendency for these findings to be interpreted as evidence for a genetic explanation of ADD/hyperactivity is not methodologically justifiable. First, as most parents are aware whether their children are monozygotic or dizygotic twins, this awareness may result in differential expectations regarding the same behavior(s) in identical twins and different behavior(s) in fraternal twins (Whalen, 1983). Second, the findings from twin studies are based on observed activity levels in "normal" twins, not in ADD/hyperactivity twins. Generalizing such findings to the area of ADD/hyperactivity may not be appropriate, as the activity levels of ADD/hyperactive children may be qualitatively different from a "high activity level" in normal children (e.g., Ross & Ross, 1982).

In adoption studies, researchers attempt to tease out environmental influences from genetic influences by studying genetically unrelated individuals living together and genetically similar individuals living apart. With regard to adoptive parents, the prevalence of psychiatric disturbance in parents of ADD/hyperactive adoptive children does not appear to differ significantly from those rates observed in parents of "normal" adoptive children (e.g., Cantwell, 1975; Morrison & Stewart, 1973). This finding tends to add credence to the genetic influence view and to the findings of Safer (1973), who compared the prevalence of MBD in full and half-siblings reared apart. It was found that full siblings reared separately had a significantly higher concordance rate for MBD than did the half-siblings.

### *Lead Influences*

The presence of lead wastes in our environment has been pervasive since the early 1940s. Lead is a by-product of the combustion of high-octane leaded gasoline, and it is a widespread component of the air, soil, and water in urban areas having heavy automobile traffic.

Lead poisoning is often accompanied by severe psychological and neurological difficulties, including a behavior pattern characterized by hyperactivity, impulsivity, and short attention span. Preschool and primary-grade children with increased body lead levels have been found to exhibit more ADD/hyperactivity, more intellectual retardation, and a higher incidence of neurological deficits than "normal" matched control children (e.g., Rummo, Routh, Rummo, & Brown, 1979). In addition, with an increase in the levels of dentine lead content in the body, a corresponding increase in the frequency of hyperactivity, impulsivity, and distractibility has been reported in schoolchildren (Needleman, Gunnoe, Leviton, Reed, Peresie, Maher, & Barrett, 1979). Children with high dentine lead content also appear to perform significantly less well on the Wechsler Intelligence Scale for Children—Revised (WISC-R). For example, in his critical review of the research linking ADD/hyperactivity and body lead burden, Rutter (1980) concluded that the data showed small but statistically significant deficits in the cognitive performance of those children with elevated subclinical lead levels. He also concluded from his review that (1) there is a lack of methodologically sound research that links lead levels and the specific behav-

ior patterns associated with ADD/hyperactivity, and (2) there is research to support this link when more general behavior problems are considered. Ross and Ross (1982) disagreed with this conclusion, stating that, despite methodological problems and the failure to identify a mediating mechanism between ADD/hyperactivity and increased lead levels, there has been sufficient sound research to implicate excessive body lead burden in childhood ADD/hyperactivity. Barkley (1983), on the other hand, maintained that the contribution of lead poisoning to ADD/hyperactivity remains controversial.

### *Food Dyes, Additives, and Diet*

Despite the attention that food dyes, additives and diet have received in the mass media, research efforts (e.g., Connors, 1980; Taylor, 1979) have failed to support such hypotheses as the one discussed by Feingold (1975)—that artificial food colorings, artificial flavorings, and preservatives produce a toxic reaction in certain children, resulting in the behavioral symptoms of childhood hyperactivity. For example, Prinze, Roberts, and Hartman (1980) studied the relationship between sugar consumption and ADD/hyperactivity and found that the amount of sugar intake correlated significantly with the destructive/aggressive and restless behavior of ADD/hyperactive children who were 4–7 years old. Although this relationship was not found for the “normal” control children, Prinze *et al.* (1980) did find that sugar intake was correlated with locomotor activity in these children. These findings suggest that a relationship does exist between sugar consumption and motor behavior for *both* ADD/hyperactive and “normal” children, but that this relationship is manifested differently in each group of children (e.g., Whalen, 1983).

### *Developmental Delays*

The maturational lag conception of ADD/hyperactivity views the behavior(s) of ADD/hyperactive children as immature in their chronological age-related skills and abilities (Kinsbourne, 1973). It is suggested by proponents of this position that the attentional skills of ADD/hyperactive children are qualitatively similar to those of younger children—supporting the contention that the behavior(s) shown by ADD/hyperactive children are immature rather than “abnormal.” Research supporting this view includes findings of slow EEG wave pattern activity (e.g., Buchsbaum & Wender, 1973) and retarded bone age (e.g., Oettinger, 1975) among ADD/hyperactive elementary-school children that were characteristic of “normal” children who were chronologically younger than the ADD/hyperactive children. In addition to such physiological lags, some data have been reported that reflect a psychological maturational lag. Specifically, clinical and research reports have been published describing ADD/hyperactive children’s inability to adjust to situational demands and to same-age peers, as well as the tendency on the part of these children to seek out younger playmates (Henker & Whalen, 1980).

### *Psychosocial Factors*

In contrast to the etiological perspectives presented above, a movement has taken place in the literature away from the child deficit view and toward a psychosocial-ecological model of identifying ADD/hyperactive children (e.g., Henker & Whalen, 1980). Henker and Whalen (1980) pointed out that many of the proposed etiologies of ADD/hyperactivity attempt to present global profiles of ADD/hyperactive children, but when individual physiological and behavioral characteristics of the children are taken into account the profiles become increasingly inadequate in explaining the clinical picture of ADD/hyperactivity over time. These researchers suggested that environmental variables such as parental attitudes and competencies, social systems, and person-by-situation interactions must be taken into consideration if we are to understand ADD/hyperactive children.

The diathesis–stress model proposed by Bettelheim (1973) suggests that, when children who are constitutionally predisposed to ADD/hyperactivity are stressed by environmental pressures exceeding their tolerance levels, they respond with ADD/hyperactivity. In addition, maternal impatience, anxiety, and disapproval—in response to a restless infant that is predisposed to ADD/hyperactivity—may result in an exacerbation of the infant's restlessness and resistance as it becomes increasingly difficult to cope with the mother's demands for compliance (Minde, 1977). Modifications of this view have also been posited suggesting that mothers' attitudes and beliefs about child rearing may lead mothers to interact with their children in a negative and rejecting manner that elicits difficult behavior in the infant (see Ross & Ross, 1982, for a comprehensive review).

The psychosocial influence of teachers has been hypothesized as another possible contributing factor (Ross & Ross, 1982). The detection thresholds of teachers may have implications for the type of classroom interactions that they have with children, for the probability that a particular child will be diagnosed as having ADD/hyperactivity, and for the type of treatment children receive. Teachers with a tendency not to view a particular child's behavior as deviant or as warranting special intervention exhibit high detection thresholds; those with low thresholds may have high referral rates for children to receive psychological evaluations and/or intervention.

Whereas these views tend to focus on the interaction of a child with his or her immediate environment, other theoretical positions focus on environmental variables from a cultural viewpoint. For example, Block (1977) suggested that there is the possibility of a causal relationship between the increased cultural tempo of Western industrialized nations and ADD/hyperactivity in children. The available prevalence data, however, fail to demonstrate a systematic relationship between urbanization, pace of daily life, and ADD/hyperactivity. An alternative hypothesis espoused by Ross and Ross (1982) focuses on cultural and subcultural differences in the degree of consistency of basic tenets found across institutions (e.g., home, church, school, and government). Highly consistent

cultures are characterized as valuing group cohesiveness and group achievement. Individuals within such consistent cultures experience acceptance as a result of being a part of the cultural group, and the importance of individual differences is minimized. Such cultures are hypothesized to be favorable or supportive environments for ADD/hyperactive children because they provide a structure in which similar expectations for behavior are communicated across institutions within the cultures, and the ADD/hyperactive child is more likely to experience acceptance. Cultures marked by inconsistency tend to emphasize individual differences and to communicate contradictory socialization messages across institutions. Such cultures are more likely to maximize the distinction made between ADD/hyperactive and non-ADD/hyperactive children and to heighten the ADD/hyperactive child's difficulties through nonacceptance. Although this and other psychosocial views are quite interesting, such views will remain speculative until an organized body of research is published that supports them.

## DIAGNOSIS AND CLASSIFICATION

A considerable number of diagnostic labels have been used to denote the entity of ADD/hyperactivity. Even though the clinical descriptors used to characterize this disorder (namely, *chronic overactivity*, *inattentiveness*, *distractability*, and *impulsivity*) have remained amazingly stable across time, various diagnostic terms have been used to reflect the prevailing theoretical views concerning the etiology, the primary symptoms, and the treatment of this behavior disorder.

Early theorists (e.g., Still, 1902; Strecker & Ebaugh, 1924) who related hyperactive behavior patterns either to demonstrable brain damage or to a history suggesting brain damage were responsible for the diagnostic concept of *minimal brain dysfunction*. As empirical investigations provided evidence that failed to implicate brain damage as a plausible etiological explanation in all but a minority of cases, emphasis shifted to the motor-activity component, and this shift was reflected in diagnoses such as *hyperkinetic impulse disorder* and *hyperkinetic behavior syndrome* (e.g., Laufer & Denhoff, 1957; Laufer, Denhoff, & Solomons, 1957).

A number of years later, Douglas and her associates (e.g., Douglas & Peters, 1979) contended that the central diagnostic concept of this disorder was impaired attention. Consistent with this view, in 1980, the American Psychiatric Association's third edition of *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) was published, and the disorder that had previously been identified as the "hyperkinetic reaction of childhood" in DSM-II (APA, 1968) was replaced by the label "attention deficit disorder" (ADD). In addition, because of the clinical observations that many of the children who were regarded as hyperactive did not exhibit elevated levels of motor activity but did manifest difficulties in attention, two forms of ADD were noted in DSM-III: ADD with hyperactivity and ADD without hyperactivity (APA, 1980). The diagnostic criteria for ADD with hyperactivity appear in Table 1 and include at least three indicators of inattention, impulsivity, and hyperactivity for children between the ages of 8 and 10.



TABLE 1. Diagnostic Criteria for Attention Deficit Disorder with Hyperactivity

The child displays, for his or her mental and chronological age, signs of developmentally inappropriate inattention, impulsivity, and hyperactivity. The signs must be reported by adults in the child's environment, such as parents and teachers. Because the symptoms are typically variable, they may not be observed directly by the clinician. When the reports of teachers and parents conflict, primary consideration should be given to the teachers' reports because of greater familiarity with age-appropriate norms. Symptoms typically worsen in situations that require self-application, as in the classroom. Signs of the disorder may be absent when the child is in a new or a one-to-one situation.

The number of symptoms specified is for children between the ages of 8 and 10, the peak age for referral. In younger children, more *severe* forms of the symptoms and a greater number of symptoms are usually present. The opposite is true of older children.

- A. *Inattention*. At least three of the following symptoms:
1. often fails to finish things he or she starts
  2. often doesn't seem to listen
  3. easily distracted
  4. has difficulty concentrating on schoolwork or other tasks requiring sustained attention
  5. has difficulty sticking to a play activity
- B. *Impulsivity*. At least three of the following symptoms:
1. often acts before thinking
  2. shifts excessively from one activity to another
  3. has difficulty organizing work (this not being due to cognitive impairment)
  4. needs a lot of supervision
  5. frequently calls out in class
  6. has difficulty awaiting turn in games or group situations
- C. *Hyperactivity*. At least two of the following symptoms:
1. runs about or climbs on things excessively
  2. has difficulty sitting still or fidgets excessively
  3. has difficulty staying seated
  4. moves about excessively during sleep
  5. is always "on the go" or acts as if "driven by a motor"
- D. Onset before the age of 7
- E. Duration of at least 6 months
- F. Not due to schizophrenia, affective disorder, or severe or profound mental retardation

*Note.* From the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.), American Psychiatric Association, 1980. Reprinted with permission.

Older children tend to exhibit less severe forms and fewer of these behavior characteristics, whereas the opposite is true of younger children.

Diagnosis of ADD/nonhyperactivity requires that the child meet the same criteria as for ADD/hyperactivity, excluding the behaviors associated with hyperactivity. Because difficulties in identifying ADD/hyperactive children have been frequently discussed in the literature, the following case example should help clarify this classification:

Hank is an 8-year-old boy of above average intelligence who is currently attending his third school in three years. His parents report that "he has always been a difficult child to raise." He is argumentative at home and "always" wants to be right. He is not, however, "a wild child." They report that he does not like to follow their rules at home regarding homework, preferring not to do homework or to "leave it for the very last minute." He has no close friends but a few casual friends with whom he rarely plays.

He also rarely does his chores. One activity, however, that he can do at home is to sit for long periods of time and read.

At school, his teacher reports that he rarely does any of the class assignments and is getting low grades, even though she feels "he knows the material." He prefers to read rather than do any assignments or to talk quietly to other students in class and disrupt their work. He is not, however, disruptive when he is absorbed in reading his own books—something that he can do for very long periods. During class discussion, he often gives out answers to questions without raising his hand, and at recess, he plays by himself because the other students don't like him. The teacher further reports that his handwritten stories—when he does them—are typically illegible and are completed very quickly even though he is repeatedly reminded to take his time.<sup>2</sup>

The behavior disorder that we have been referring to as *ADD/hyperactivity* has been variously referred to by others as brain damage, conduct disorder, and learning disability. In Great Britain, for example, some investigators have questioned the existence of ADD/hyperactivity as a clinical entity. They consider ADD/hyperactivity a particular form of conduct disorder (e.g., Sandberg, Rutter, & Taylor, 1978). Indeed, the differentiation of ADD with hyperactivity from conduct disorder frequently presents a diagnostic dilemma for clinicians. Behavioral patterns overlapping for the two diagnoses include disobedience, persistent lying, inattention, impulsivity, destructiveness, aggression, and other socially inappropriate behaviors (Whalen, 1983). Some writers (e.g., Stewart *et al.*, 1981) have even suggested that ADD/hyperactivity and conduct disorder are each examples of the same behavior problem, called an *externalizing disorder*.

A second construct that overlaps with ADD/hyperactivity is learning disability. The academic achievement of ADD/hyperactive children is frequently below average, a finding that should not be unexpected given their difficulties with impulsivity and inattention. Although not all ADD children are considered learning disabled, it has been estimated that 78% of children diagnosed as ADD/hyperactive evidence serious learning difficulties, and that 39% of learning-disabled children may be classified as ADD/hyperactive (e.g., Safer & Allen, 1976). Cantwell and Satterfield (1978) reported that 76% of the ADD/hyperactive group that they examined were achieving below expected grade level in at least two academic subjects. The question that therefore arises is whether these two disorders are independent of each other.

### *Problems with Definition*

The definitional criteria for diagnosing ADD with or without hyperactivity have been acclaimed as a much needed improvement over the criteria specified for hyperkinetic reaction of childhood in DSM-II. Nevertheless, the DSM-III criteria are not without their own set of difficulties. Although research has been found to support the use of the diagnosis of ADD with hyperactivity, a distinct pattern following the criteria for ADD without hyperactivity has not yet been reliably confirmed in the literature (e.g., Achenbach, 1980).

Barkley (1981a, 1983) has pointed out several shortcomings of the DSM-III

<sup>2</sup>This case study has been changed slightly to protect the anonymity of the client involved.

criteria for ADD. First, the DSM-III criteria for ADD do not specify how pervasive the described behaviors need to be to warrant the making of a diagnosis. The question that is therefore left unanswered is whether the clinician should base a diagnosis on the report of a single source or should require evaluations from several sources, such as parents and teachers. Also, some diagnosticians require evidence of the behavior cross-situationally before they will apply the diagnosis, whereas others do not. Second, Barkley maintains that the DSM-III criteria for ADD do not delineate how excessive or deviant the child's symptoms must be in order to be discriminated from "normal childhood behavior." Third, Barkley feels that the cutoff age of onset (7 years) is too liberal, as most ADD children can be identified by age 3. One possible result of this liberal cutoff is that a significant number of learning-disabled children may be misdiagnosed as ADD. Finally, Barkley maintains that use of the term *hyperactivity* for denoting one of the symptoms of the behavior disorder, ADD with hyperactivity, is unnecessarily confusing.

### *Clinically Derived Diagnostic Systems*

The need for a systematic classificatory system for childhood behavior disorders has long been acknowledged; yet there is widespread disagreement about (1) how the behavior disorders should be conceptualized; (2) who should be the target of assessment (e.g., parents, teachers, or the child); and (3) to what end assessment should be used. Three common purposes of child behavior assessment reported by Mash and Terdal (1981) are (1) diagnosis—identifying the nature of the child's problem; (2) design—gathering data that will aid in the development of a treatment strategy; and (3) evaluation—determining the efficacy of the treatment.

Two general categories of classification approaches have been used in the area of childhood behavior assessment. The first category includes clinically derived systems such as the American Psychiatric Association's DSM-III (1980) and the ninth revision of the World Health Organization's *International Classification of Diseases* (ICD-9;). A second category of classification systems has been described as empirically oriented, and these involve the use of multivariate statistical procedures (see, for example, Achenbach & Edelbrock, 1978; Quay, 1979).

The DSM-III applies a multiaxial approach to the diagnosis of both adults and children, contrasted with the ICD-9, which offers a multiaxial coding that is optional and is limited to children. An advantage of the multiaxial approach is that it provides a means for communicating a broader scope of information and a more accurate description of the diagnosis (Mash & Terdal, 1981).

The multiaxial systems of DSM-III and ICD-9 each use five axes for children, some of which are comparable and others of which are not. The multiaxial approach for these two classification systems is presented in Table 2.

With respect to attention deficit disorders, the DSM-III differentiates between two categories: ADD with and without hyperactivity. The ICD-9 clinical modification (CM) refers to ADD without mention of hyperactivity. The ICD-9-

TABLE 2. Multiaxial Classifications of ICD-9 and DSM III for Children

Clinical Psychiatric Syndrome(s)	Axis I	Clinical Psychiatric Syndrome
Specific Development Disorders <sup>a</sup>	Axis II	Special Delays in Development
Non-Mental Medical Disorders	Axis III	Intellectual Level
Severity of Psychosocial Stressors	Axis IV	Medical Conditions
Highest Level of Adaptive Functioning During Past Year	Axis V	Psychosocial Stress

Note. From R. Gittelman-Klein, R. L. Spitzer, and D. Cantwell (1978). *Diagnostic Classifications and Psychopharmacological Indications*. In J. S. Werry (Ed.), *Pediatric Psychopharmacology: The Use of Behavior Modifying Drugs in Children*. New York: Brunner/Mazel. Reprinted with permission.

<sup>a</sup>In adults, Axis II is used for coding Personality Disorders, when appropriate.

CM has the additional classifications of hyperkinesis with developmental delay and hyperkinetic conduct disorder. Rather than requiring separate diagnoses of ADD with hyperactivity and/or conduct disorder, when criteria for each are present, the ICD-9-CM provides a diagnostic entity that is in accordance with the position that hyperactivity and conduct disorder cannot be differentiated (e.g., Sandberg, Weiselberg, & Shaffer, 1980).

### *Empirically Derived Diagnostic Systems*

Multivariate statistical procedures have been used in empirical attempts to identify a factor corresponding to ADD. Using data obtained from behavioral checklists and rating scales, investigators have sought to identify a cluster of symptoms such as distractibility, impulsivity, and hyperactivity associated with ADD. However, in their critical review of this area, Ross and Ross (1982) reported that such identification attempts have generally failed (e.g., Dreger, 1964; Paine, Werry, & Quay, 1968; Rodin, Lucas, & Simson, 1963; Routh & Roberts, 1972; Werry, 1968). What researchers found, instead of one or two factors comprising ADD, was a tendency of the multivariate analyses to yield numerous small and independent factors corresponding to the informational sources used. Ross and Ross (1982) concluded that the factor-analytic approach has provided little evidence to support the concept of a unitary cluster of symptoms for hyperactivity.

## BEHAVIORAL ASSESSMENT OF ATTENTION DEFICIT DISORDER

Behavioral assessment is generally conceptualized as specifying a problem-solving strategy approach rather than advocating a specific set of assessment techniques and procedures (Mash & Terdal, 1981). As we examine a number of different techniques that have been used to assess ADD, it will become evident that devices such as self-report measures and checklists and rating scales that were developed for more traditional assessment approaches have also been used in child behavioral assessment.

When comparing behavioral assessment with more traditional approaches to assessment, one finds that the assumptions under which the approaches operate are quite different (e.g., Hartmann, Roper, & Bradford, 19179; Nelson & Hayes, 1979). For example, those working from a behavioral approach focus assessment on environmental and person–environment factors that are relevant to the development of a treatment program. In contrast, traditional (psycho-dynamic) approaches attempt to identify underlying causes. Traditional approaches to assessment, including psychoeducational evaluation using measures of intelligence and achievement, have received wide application in the assessment of hyperactivity, as have measures of specific constructs (for example, activity level, impulsivity, and distractibility).

Drawing from Skinner's work on attention span and self-control (Skinner, 1953, 1967), Barkley (1981b) has suggested a conceptual framework for viewing ADD that accounts for the primary symptoms of the disorder, including poor attention span, impulsivity, and distractibility or poor concentration, as well as the secondary symptoms of poor social relationships, poor academic achievement despite normal intelligence, and aggression. A brief discussion of Barkley's framework (1981a) will be useful because it has some important implications for the assessment of ADD/hyperactive children. Attention deficit is described in this view as a disturbance in the functional relationship between a controlling stimulus and a response. *Poor attention span* refers to the inability to persist in the performance of a task beyond that point at which the child becomes bored with or uninterested in the task regardless of the presence or absence of distracting stimuli. *Distractibility or poor concentration* is viewed as the inability to attend selectively to appropriate or relevant stimuli in a given situation, or as the overselectivity of attention to irrelevant stimuli. *Poor impulse control* is viewed as the tendency to respond to stimuli quickly and without considering alternatives.

The ADD/hyperactive child's difficulties in the area of self-control are postulated to result from an inability to shift the control of responses from external social stimuli (people) to nonsocial internal stimuli (Barkley, 1981b). In order to do so, a child must be able to respond to an internal stimulus that represents a previously overt rule—or she or he must be able to internalize rule-governed behavior. Barkley (1981b) suggested that the major difficulties that hinder ADD/hyperactive children from internalizing rule-governed behavior involve (1) neurological defects that prevent the translation of linguistic stimuli into motoric behaviors, and/or (2) inadequate training of the child to respond to compliance with social rules. This leads to a definition of ADD/hyperactivity as

the developmental deficiency of age and appropriate attention and rule-governed behavior (self-control) that is present in the child since at least age 2–4 years, that is pervasive in nature (cross-situational), and that cannot be attributed to mental retardation, psychosis, or gross neurologic, sensory, or motor impairments. (Barkley, 1981b, p. 140)

This definition was changed slightly by Barkley in 1983 to the following:

Hyperactivity is a developmental disorder of attention, impulse control, and rule-governed behavior (compliance, self-control, and problem solving) that arises early in development, is significantly chronic and pervasive in nature, and is not attributable to

mental retardation, deafness, blindness, gross neurologic impairment or severe emotional disturbance, i.e., psychosis or autism. (p. 83)

On the basis of these definitions, Barkley (1981b) proposed the following implications for the assessment of ADD/hyperactive children:

1. Because the primary behavior problems of hyperactive children are characterized by an early onset and by chronicity, assessment procedures should be reliable across time and valid across age level and should provide developmental norms in order to facilitate the comparison of findings obtained through repeated assessments. Methods that assess social and academic deficits should be used, given the increasing difficulties evidenced in these areas as the child progresses through development.
2. The frequently cross-situational nature of a child's hyperactivity necessitates the use of informants who have contact with the child in different situational contexts. Parents, teachers, clinicians, and relatives who have contact with the child are usually appropriate and valuable sources of information.
3. The behavioral view of hyperactivity as involving multiple deficits in attention, rule-governed behavior, and self-control requires that we assess the abilities of the child to sustain attention and to follow rules in the various social contexts of home, school, and public.
4. The social context of the hyperactive child's behavioral difficulties should be assessed, as the responses of parents, teachers, and peers frequently act to exacerbate the child's hyperactive behaviors in a number of ways.
5. Assessment procedures should include an evaluation of the psychological adjustment of parents and other family members.
6. Assessment, as well as treatment, should focus on the nature of the social interactions between parent(s) and child regardless of the presumed etiology of the disorder. Both the form of expression and the severity of the disorder are affected by the social interactions between the parent(s) and the child. (Adapted from Barkley, 1981b, pp. 145-146)

On the basis of this view, Barkley (1982) proposed those statements listed in Table 3 as the criteria for defining ADD/hyperactivity.

### *Interview Assessment*

The clinical interview is among the most frequently used assessment methods for gathering data, regardless of the therapeutic orientation of the evaluator. Although there is a possibility of unreliability of the data collected with this approach, several advantages of the interview have been addressed in the literature (e.g., Kratochwill, 1982; Linehan, 1977; Morris & Kratochwill, 1983). For example, this assessment method allows the therapist to structure questions, response options, and the content explored. This approach provides the therapists with a degree of flexibility not readily available with the use of other methods.

TABLE 3. Criteria for Defining Hyperactivity in Children

- 
1. Parent and/or teacher complains of poor attention span, impulsivity, restlessness, and inability to restrict behavior as a situation demands.
  2. These complaints of behavior must place the child two standard deviations above the mean for his or her age group relative to children of similar chronological or mental age as determined by a well-standardized behavior-rating scale of parent or teacher opinion.
  3. The parents must report that the child's behavior has been a problem since 5 years of age (up to 5 years 11 months).
  4. The chronicity of duration of symptoms as reported by parent or teacher must be at least one year for children 6 years of age or younger.
  5. The pervasiveness of the behavior problems is determined by the extent to which the symptoms occur in more than one situation. On the Home Situations Questionnaire for parents or the School Situations Questionnaire for teachers, the child must be rated as a problem in at least 50% of the settings on either scale.
  6. The child must have an intellectual estimate of at least 70 or higher on a well-standardized measure of intelligence, or his or her symptoms as measured in #2 must be compared against children of similar mental age.
  7. The child cannot display symptoms of autism or psychosis, as defined in the DSM-III, or show evidence of blindness, deafness, severe language delay, or gross neurological disease.
- 

*Note.* Criteria are adapted from "Guidelines for Defining Hyperactivity in Children (Attention Deficit Disorder with Hyperactivity)" by R. Barkley. In B. Lahey and A. Kazdin (Eds.), *Advances in Clinical Child Psychology*, Vol. 5. New York: Plenum Press, 1982.

A second advantage of this method is that it promotes the development of a relationship between the parents, the child, and the therapist. Building rapport with the parents and the child is critical for ensuring parental cooperation in the treatment process, as well as for developing a therapeutic relationship with the child. A third advantage of the interview is that it makes possible the attainment of data that might otherwise go undetected.

Interviews vary in the degree to which the questions that are asked are predetermined (Morris & Kratochwill, 1983). Along this dimension, interview formats may be categorized as standardized interviews, moderately standardized interviews, and unstandardized interviews. A standardized interview provides a well-defined list of questions or statements to be used in the interview. Moderately standardized interviews provide greater flexibility, as they do not specify the exact phrasing of questions. Unstandardized interviews have no predetermined questions or formats. This type of interview provides considerable flexibility for the exploration of a problem area (Morris & Kratochwill, 1983).

Relatively few standardized interview formats have been described in the literature in sufficient detail to be useful for clinical and research purposes (Morris & Kratochwill, 1983). In fact, one review article discussed only five standardized interview instruments (Hodges, Kline, Stern, Cytryn, & McKnew, 1982): (1) an assessment interview described by Rutter and Graham (1968); (2) the Mental Health Assessment Form (Kestenbaum & Bird, 1978); (3) the Children's Psychiatric Rating Scale (CPRS), which was developed by members of the Pediatric Psychopharmacological Workshop (Guy, 1976); (4) the *Schedule for Affective Disorders and Schizophrenia* for school-aged children (Kiddie-sads) (Chambers, Puig-Antich, & Tabrizi, 1978); and (5) an interview developed by Herjanic, Herjanic, Brown, and Wheatt (1975).

The major criticism of these instruments is that they fail to provide a standard set of questions or list of topics to be used in the interview. The Rutter and Graham (1968) interview and the Mental Health Assessment Form specify general guidelines about topics to be addressed, but the Children's Psychiatric Rating Scale does not provide any suggestions about the content of the interview. The Kiddie-sads provides a standardized set of questions, but it is not appropriate for the assessment of ADD because it is designed primarily for the assessment of affective disorders and schizophrenia. Standardized questions are also included in the Herjanic *et al.* (1975) instrument, but it has the limitation of being lengthy and requiring children to make difficult discriminations about symptoms (for example, manic mood, dysphoric mood, and psychotic symptoms).

One instrument that is representative of a standardized interview format is the Child Assessment Schedule (CAS) (Hodges, Kline, Fitch, McKnew, & Cytryn, 1981), which was modeled after the adult psychiatric interview developed by Spitzer, Endicott, Fleiss, and Cohen (1970). The CAS is a two-part interview that takes approximately 45 minutes to administer. The first part is a semistructured interview consisting of approximately 75 questions covering 11 content areas: family, school, friends, activities and hobbies, self-image, mood, expression of anger, somatic concerns, fears, worries, and thought disorder symptoms. The second part of the CAS consists of 53 items for which the examiner is asked to record observations about the child's insight, cognitive abilities, motor coordination, activity level (also, attention span and impulsivity), quality of verbal communications, quality of emotional expression, other spontaneous behaviors, and impressions about the quality of interpersonal interactions (Hodges *et al.*, 1982).

Scores are derived from this interview format for total psychopathology, for each of the 11 content areas (for example, the number of items scored in the direction indicating a problem in the area of "school"), and for a set of symptom complexes that are analogous to the children's DSM-III diagnoses. In the Hodges *et al.* (1982) report of the validity and reliability of the Child Assessment Schedule, the researchers reported that the CAS was able to discriminate among (1) child inpatients and normal control children using the total psychopathology score and (2) all symptom complex subscales except ADD/nonhyperactivity and the content areas of "fears" and "worries." Scores obtained for the ADD/hyperactivity subscale were found to discriminate significantly between the different levels of psychopathology. In explaining the failure of the nonhyperactivity subscale to discriminate between levels of psychopathology, Hodges *et al.* (1982) suggested that the diagnostic criteria for this symptom complex necessitate observation of the child in a structured situation, such as the classroom, and that this is inconsistent with the format of the CAS. They also pointed out the questionable reliability of the diagnostic criteria reported for this diagnosis in the original DSM-III field study (see, for example, Williams & Spitzer, 1980).

Concurrent validity of the CAS was demonstrated by comparisons with several other indicators of child psychopathology. Relevant to the assessment of ADD was the finding that the ADD/hyperactive symptom complex of the CAS



TABLE 4. Parental Interview Format

Situations to be discussed with parents	Follow-up questions for each problem situation
General—overall interactions	1. Is this a problem area? If so, proceed with Questions 2 through 9
Playing alone	2. What does the child do in this situation that bothers you?
Playing with other children	3. What is your response?
Mealtimes	4. What will the child do next?
Getting dressed in morning	5. If the problem continues, what will you do next?
During washing and bathing	6. What is usually the outcome of this interaction?
While parent is on telephone	7. How often do these problems occur in this situation?
While watching television	8. How do you feel about these problems?
While visitors are at home	9. On a scale of 0 to 10 (0 = no problem; 10 = severe problem), how severe is this problem to you?
While visiting others' homes	
In public places (supermarkets, shopping centers, etc.)	
While mother is occupied with chores or activities	
When father is at home	
When child is asked to do a chore	
At bedtime	
Other situations (in car, in church, etc.)	

*Note.* Adapted from C. Hanf, University of Oregon Health Sciences Center, 1976. Reprinted from R. Barkley, "Hyperactivity." In E. J. Mash and L. G. Terdal (Eds.), *Behavioral Assessment of Childhood Disorders*. New York: Guilford Press, 1981, pp. 127–184.

correlated significantly with the hyperactive scale of Achenbach's Child Behavior Checklist ( $r(74) = .44$ ;  $p < .001$ ). Adequate interrater agreement, therefore, has been reported by Hodges *et al.* (1982) for all but three scales of the CAS (content areas: fears and worries; symptom complex: ADD/nonhyperactive). Although it appears that the CAS is a promising standardized interview format for clinical and research purposes, further research is needed to provide independent reliability and validity data.

A second standardized interview format that has been used in the assessment of ADD/hyperactive children involves the evaluation of parent-child interaction in numerous situations. It is an interview format that was adapted by Barkley (1981b) from a format developed by Constance Hanf in 1976 at the Health Sciences Center of the University of Oregon. An example of this format is presented in Table 4. A clinical example of the implementation of this interview format is presented below:

*Examiner:* How does your child generally behave when there are visitors to your home?

*Mother:* Terrible! He embarrasses me tremendously.

*E:* Can you give me some idea of what he does specifically that is bothersome in this situation?

*M:* Well, he won't let me talk with the visitors without interrupting our conversation, tugging on me for attention, or annoying the guests by running back and forth in front of us as we talk.

*E:* Yes? And what else is he likely to do?

- M: Many times, he will fight with his sister or get into something he shouldn't in the kitchen.
- E: How will you usually respond to him when these things happen?
- M: At first I usually try to ignore him. When this doesn't work, I try to reason with him, promise I'll spend time with him after the visitors leave, or try to distract him with something he usually likes to do just to calm him down so I can talk with my guests.
- E: How successfully does that work for you?
- M: Not very well. He may slow down for a few moments, but then he's right back pestering us or his sister, or getting into mischief in the kitchen. I get so frustrated with him by this time. I know what my visitors must be thinking of me not being able to handle my own child.
- E: Yes, I can imagine it's quite distressing. What will you do at this point to handle the situation?
- M: I usually find myself telling him over and over again to stop what he is doing, until I get very angry with him and threaten him with punishment. By now, my visitors are making excuses to leave and I'm trying to talk with them while yelling at my son.
- E: And then what happens?
- M: Well, I know I shouldn't, but I'll usually grab him and hold him just to slow him down. More often, though, I may threaten to spank him or send him to his room. He usually doesn't listen to me though until I make a move to grab him.
- E: How often does this usually happen when visitors are at your home?
- M: Practically every time; it's frustrating.
- E: I see. How do you feel about your child creating such problems in front of visitors?
- M: I find myself really hating him at times (*cries*); I know I'm his mother and I shouldn't feel that way, but I'm so angry with him, and nothing seems to work for me. Many of our friends have stopped coming to visit us, and we can't find a babysitter who will stay with him so we can go out. I resent having to sacrifice what little social life we have. I'm likely to be angry with him the rest of the day. (Barkley, 1981b, pp. 149–150)

### *Behavior Rating Scales and Checklists*

Behavior rating scales and checklists are indirect assessment strategies that ask an individual to rate the client based on past observations of that child's behavior (Morris & Kratochwill, 1983). Rating scales are generally inexpensive, are quickly and easily administered, and may be used to obtain data from various sources, including teachers, parents, peers, and self-reports. The data quantification methods available with many rating scales have provided for the application of multivariate statistical procedures, such as factor analysis, to identify clusters of highly intercorrelated behaviors that may be hypothesized to represent a behavioral dimension (Morris & Kratochwill, 1983). Aside from aiding in the decision about whether a problem exists, these measures have been used to evaluate the effectiveness of treatment interventions, and they may be useful in identifying primary targets for treatment. However, they generally lack the specificity necessary to identify the antecedent and consequent variables associated with a specific behavior problem, and these data are essential for the development of the behavior therapy treatment plan (Barkley, 1981a). Despite their shortcomings, behavior rating scales of hyperactivity have been used extensively in clinical-applied and research settings. Teacher rating instruments tend

Observation	Degree of activity			
	Not at all	Just a little	Pretty much	Very much
<b>CLASSROOM BEHAVIOR</b>				
1. Constantly fidgeting				
2. Hums and makes other odd noises				
3. Demands must be met immediately—easily frustrated				
4. Coordination poor				
5. Restless or overactive				
6. Excitable, impulsive				
7. Inattentive, easily distracted				
8. Fails to finish things he starts—short attention span				
9. Overly sensitive				
10. Overly serious or sad				
11. Daydreams				
12. Sullen or sulky				
13. Cries often and easily				
14. Disturbs other children				
15. Quarrelsome				
16. Mood changes quickly and drastically				
17. Acts "smart"				
18. Destructive				
19. Steals				
20. Lies				
21. Temper outbursts explosive and unpredictable behavior				

**GROUP PARTICIPATION**

22. Isolates himself from other children				
23. Appears to be unaccepted by group				
24. Appears to be easily led				
25. No sense of fair play				
26. Appears to lack leadership				
27. Does not get along with opposite sex				
28. Does not get along with same sex				
29. Teases other children or interferes with their activities				

**ATTITUDE TOWARD AUTHORITY**

30. Submissive				
31. Defiant				
32. Impudent				
33. Shy				
34. Fearful				
35. Excessive demands for teacher's attention				
36. Stubborn				
37. Overly anxious to please				
38. Uncooperative				
39. Attendance problem				

FIGURE 1. Conners Teacher Rating Scale. Copyright 1969 by Abbott Laboratories. Reprinted with permission.

to be the most frequently used, followed by parent scales, and more recently, attention has been paid to the development of peer- and self-rating scales of ADD/hyperactivity.

The 39-item Conners Teacher Rating Scale (TRS; see Figure 1) was originally developed as a screening instrument, as well as for evaluating the outcome of treatment (Conners, 1969). Item responses consist of a 4-point scale with the following labels and numerical scoring weights: 0—not at all; 1—just a little; 2—pretty much; and 3—very much. An early factor-analytic study by Conners (1969) identified five primary factors in this rating scale: conduct disorder, inattentive-passive, tension-anxiety, hyperactivity, and sociability. Each of these factors, with the exception of sociability, have been found to be useful for identifying ADD/hyperactive children. In addition to obtaining scores by summing the items in each factor, one may also calculate global scores (e.g., classroom behavior, group participation, attitude toward authority and hyperkinesis index). A mean item score of 1.5, or 50%, on the hyperactivity factor has been recommended as the criterion for defining hyperactivity (Sprague, Cohen, & Werry, 1974).

Studies regarding the validity of the TRS have found that the hyperactivity factor can discriminate significantly between normal and hyperactive children (Conners, 1970; Sprague, Christensen, & Werry, 1974; Kupietz, Bialer, & Winsberg, 1972). The scale has also been found to be sensitive to drug treatment (Conners, 1969, 1973; Werry & Sprague, 1970, 1974; Winsberg, Yepes, & Bialer, 1976), as well as to behavior therapy approaches (O'Leary & Pelham, 1978; O'Leary, Pelham, Rosenbaum, & Price, 1976). With regard to the reliability of the TRS, test-retest factor reliabilities have ranged from .70 to .90. (Conners, 1973). Werry and Sprague (1974), however, concluded that the reductions in scores that have been observed from the first to second ratings are attributable to practice effects, but that this is not the case in the reduction in scores from the second to the third ratings. On the other hand, other investigators have suggested that these reductions are more likely to be due to statistical regression (e.g., Milich, Roberts, Loney, & Caputo, 1980). With the exception of this controversy, test-retest and interrater reliability of the TRS appear to be within an acceptable range (Trites *et al.*, 1979).

New norms for the TRS have also been developed. Arguing that previous factor-analytic studies tended to use small samples that were biased toward pathology, Trites, Blouin, and Laprade (1982) conducted a factor-analytic study of the TRS based on a stratified random sample of 9,583 children. This is the largest random sample of children to be rated on the TRS. Norms for the TRS are presented in Table 5. The six factors obtained in this study were labeled hyperactivity, conduct disorder, emotional overindulgent, anxious-passive, asocial, and daydreams/attendance problem.

In order to simplify the administration and interpretation of the TRS, a revision of the 39-item scale was undertaken by Goyette, Conners, and Ulrich (1978). A 28-item revised scale was developed with improved clarity of wording. Items that were not found to load significantly on factors in prior factor-analytic studies, as well as redundant items, were dropped from the revised scale, and

similar items were combined into a single item. Factor analysis of this revised scale yielded three factors (conduct problem, hyperactivity, and inattentive-passive).

Conners (1973) used items that overlapped on both the Conners parent and the Conners teacher questionnaires to form the 10 items of the Conners Abbreviated Parent-Teacher Questionnaire (ATQ; see Figure 2). The overlap of items from the parent and teacher scales allows for the comparison of ratings from both parents and teachers on a common set of items. The ATQ is comparable in response format to the other Conners scales, with items rated on a 4-point scale ranging from 0 = not at all to 3 = very much. Scores on this questionnaire range from 9 to 30, and a criterion of 15 or higher (i.e., two or more standard deviations above the mean) has been used as a cutoff to indicate ADD/hyperactivity (Sprague & Sleator, 1977). This scale has been popular because of its simplicity and its sensitivity to drug effects (Whalen & Henker, 1976). Items on the 39-item scale relating to anxiety and sociability that were found to be insensitive to drug effects were excluded from the ATQ. High interscale predictability has been reported between the Conners ATQ and the Davids Rating Scales for Hyperactivity (Zentall & Barack, 1979).

Satisfactory test-retest reliability has been reported for the ATQ when it was administered two weeks apart ( $r = .89$ ; Zentall & Barack, 1979). Using a sample of 605 Israeli children, Margalit (1983) reported high internal consistency reliability for the ATQ (using Cronbach's method;  $\alpha = .90$ ), as well as high factor reliability in comparing ADD/hyperactive and nonhyperactive children on all 10 categories of the ATQ. Using a high factor-loading cutoff of .64, Margalit (1983) derived two factors labeled "restlessness" and "emotional lability." It was concluded from this study that diagnostic application of the ATQ need not be limited to decisions based solely on total "global" scores, but that they could also extend to the factors and categories associated with the ADD/hyperactive disorder.

The Davids Rating Scales for Hyperactivity (Davids, 1971) asks parents, teachers, or other significant adults who have considerable contact with the child to provide ratings of seven behavioral characteristics. Of these characteristics, six are scored for evaluating ADD/hyperactivity: hyperactivity, short attention span (poor powers of concentration), variability (e.g., unpredictability or fluctuations in behavior), impulsiveness and inability to delay gratification, irritability (e.g., low frustration tolerance and easily upset), and explosiveness. Respondents are asked how frequently a child demonstrates these behaviors compared to "normal" children, and responses are given on a 6-point Likert-type scale with labels ranging from "much less" to "much more" than other children. The response format has been criticized for failing to provide a response option for rating "average" children, as the respondents are forced to rate "average" children as "slightly more" or "slightly less" than "normal" children (Ross & Ross, 1982).

Each item on the Davids scale is scored from 1 to 6 points. Unfortunately, no large-scale normative studies have been conducted to validate the ADD/hyperactive criterion scores provided by Davids (1971), but based on a series of un-

TABLE 5. Means and Standard Deviations on the Connors Teacher Rating Survey for Males and Females of Different Ages

Age and n	Factor 1 (%) <sup>a</sup>	Factor 2 (%)	Factor 3 (%)	Factor 4 (%)	Factor 5 (%)	Factor 6 (%)
MALES						
4 years (315)						
M	19.41	11.57	13.91	21.17	12.63	13.07
SD	18.76	16.55	16.16	19.83	17.71	14.17
5 years (487)						
M	19.89	9.52	12.49	21.01	8.57	13.13
SD	19.68	15.31	17.37	19.14	14.95	15.21
6 years (600)						
M	24.21	10.70	12.77	24.64	9.23	17.68
SD	22.10	17.18	16.21	20.52	16.16	18.24
7 years (452)						
M	21.96	10.73	11.81	19.83	8.00	14.78
SD	20.29	15.88	16.49	18.72	13.98	16.48
8 years (596)						
M	21.70	10.74	12.39	19.65	11.43	15.68
SD	20.43	15.42	15.99	18.25	17.21	16.88
9 years (666)						
M	22.96	11.59	12.71	22.59	10.73	16.84
SD	20.52	16.73	18.02	18.81	16.26	17.25
10 years (769)						
M	20.78	11.30	12.75	21.68	10.96	15.42
SD	19.43	16.28	16.59	17.33	16.60	16.74
11 years (713)						
M	20.11	11.32	11.96	18.90	10.88	15.28
SD	20.05	17.35	16.83	16.76	16.86	16.93
12 years (208)						
M	28.15	18.01	17.68	23.24	15.89	22.18
SD	24.33	22.27	20.14	18.12	20.31	20.13

		FEMALES									
4 years (303)	M	12.34	7.68	13.63	23.75	10.04	10.51				
	SD	14.51	13.30	17.51	20.39	16.33	14.05				
5 years (438)	M	12.32	5.75	12.01	22.24	7.28	10.49				
	SD	14.98	11.12	16.57	20.56	12.91	14.50				
6 years (517)	M	14.62	6.25	10.97	23.69	7.26	12.52				
	SD	19.20	12.83	14.97	20.41	14.57	16.86				
7 years (566)	M	12.13	5.34	9.03	19.43	6.57	9.63				
	SD	15.68	11.23	13.66	18.77	12.89	14.05				
8 years (587)	M	14.32	6.59	10.53	20.20	10.23	12.39				
	SD	16.52	11.75	14.38	18.76	17.57	15.16				
9 years (616)	M	13.55	6.98	11.64	24.03	8.66	10.51				
	SD	16.47	13.23	15.87	19.55	14.44	13.04				
10 years (687)	M	12.43	5.68	9.17	23.67	8.89	11.14				
	SD	15.66	12.14	13.66	18.26	14.97	14.28				
11 years (632)	M	11.70	6.56	8.93	19.25	8.29	10.63				
	SD	15.93	13.75	13.54	18.25	15.42	14.65				
12 years (150)	M	16.65	10.43	15.48	26.96	14.98	17.78				
	SD	19.46	18.94	20.05	21.74	12.14	20.68				

Note. From R. Trites, A. Blouin, and K. Laprade, "Factor Analysis of the Conners Teacher Rating Scale Based on a Large Normative Sample," *Journal of Consulting and Clinical Psychology*, 50, 615-623. Copyright by American Psychological Association. Reprinted with permission.  
 \*Factor 1 = Hyperactivity; Factor 2 = Conduct Disorder; Factor 3 = Emotional Overindulgent; Factor 4 = Anxious-Passive; Factor 5 = Asocial; Factor 6 = Daydreams/Attendance Problem.

**Abbreviated Parent-Teacher Questionnaire**

Patient Name \_\_\_\_\_ Patient Number \_\_\_\_\_  
 Study Number \_\_\_\_\_

Parent's Observations  
 Information obtained \_\_\_\_\_ by \_\_\_\_\_  
 Month Day Year

Observation	Degree of Activity			
	Not at all	Just a little	Pretty much	Very much
1. Restless or overactive				
2. Excitable, impulsive				
3. Disturbs other children				
4. Fails to finish things he starts—short attention span				
5. Constantly fidgeting				
6. Inattentive, easily distracted				
7. Demands must be met immediately—easily frustrated				
8. Cries often and easily				
9. Mood changes quickly and drastically				
10. Temper outbursts, explosive and unpredictable behavior				

Teacher's Observations  
 Information obtained \_\_\_\_\_ by \_\_\_\_\_  
 Month Day Year

Observation	Degree of Activity			
	Not at all	Just a little	Pretty much	Very much
1. Restless or overactive				
2. Excitable, impulsive				
3. Disturbs other children				
4. Fails to finish things he starts—short attention span				
5. Constantly fidgeting				
6. Inattentive, easily distracted				
7. Demands must be met immediately—easily frustrated				
8. Cries often and easily				
9. Mood changes quickly and drastically				
10. Temper outbursts, explosive and unpredictable behavior				

Other Observations of Parent or Teacher (Use reverse side if more space is required)

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

FIGURE 2. Conners Abbreviated Parent-Teacher Rating Scale. Copyright 1973 by Abbott Laboratories. Reprinted with permission.

published studies, Davids (1971) reported that scores of 24 and higher suggest the presence of hyperactivity in a child, scores between 19 and 23 are "suspicious" of hyperactivity, and scores of 18 or less suggest the absence of significant hyperactivity. It has also been reported that 16% of elementary-school children fall within the higher hyperactivity range on the Davids Scale (Zentall, 1980), and that this percentage level is comparable to those levels reported in other studies in the public schools (e.g., Trites, Dugas, Lynch, & Ferguson, 1979; Zentall & Barack, 1979).



With regard to the validity of the Davids scale, one double-blind crossover study found that the scale is sensitive to active stimulant medication (Dexedrine) (Denhoff, Davids, & Hawkins, 1971), as well as a milder stimulant (caffeine) (Schnackberg, 1973). This scale has also been found to have good predictive validity (Zentall, 1980), as well as good reliability and concurrent validity (Zentall & Barack, 1979). An interrater reliability coefficient of  $r = .94$  was obtained in a small sample of children who were first rated on the scale by one teacher and were then rated five months later by a second teacher (Zentall & Barack, 1979). Test-retest reliability was also good, with  $r = .708$  for the scale administered 5 to 5½ months apart. In terms of concurrent validity, the scale has been shown to correlate significantly with scores on the Conners ATQ, yielding overall correlation of  $r(228) = .844$  in both regular and special school settings. Zentall and Barack (1979), however, reported that the Conners scale has a more conservative criterion for labeling a child as ADD/hyperactive. Zentall (1984) further reported that interscale agreement is moderate between teacher ratings on the Davids and parent ratings on the Werry-Weiss-Peters Activity Rating Scale. In comparing the context effects of these two scales, it has been found that children rated as ADD/hyperactive by teachers on the Davids scale may be clearly differentiated from "normal" control children in such behavior areas as more gross-motor activity (including getting up or changing activities); excessive talking, noise, and interruption of others; and excessive restlessness and dependency (Zentall, 1984).

The Werry-Weiss-Peters Activity Rating Scale (WWPARS; Werry, 1968; Werry, Weiss, Douglas, & Martin, 1966) consists of 31 items that ask parents to rate specific behaviors within seven different settings: (1) mealtime; (2) watching television; (3) doing homework; (4) playing; (5) sleeping; (6) public places; and (7) school. Responses for each item require the parents to indicate whether the child demonstrates "none," "a little bit," or "very much" of a given behavior, with scores of 0, 1, and 2, respectively, assigned to the answers. A total hyperactivity score is obtained by summing across all items of the scale. The scale has been found to significantly discriminate between ADD/hyperactive and "normal" children (Sprague, Barnes, & Werry, 1970) and to be drug-sensitive (e.g., Conners, Rothschild, Eisenberg, Schwartz, & Robinson, 1969; Knights & Hinton, 1969; Rapoport, Abramson, Alexander, & Lott, 1971).

Werry (1978) criticized the concurrent validity of his scale, citing its low correlation with objective measures of activity and teachers' estimates of hyperactivity, as well as the tendency of the scale to correlate more highly with estimates of conduct disturbance than with activity level. Ross and Ross (1982) suggested that Werry's self-critique is too harsh. Earlier conceptions of ADD/hyperactivity as involving a significant quantitative difference in the activity level of ADD/hyperactive compared to nonhyperactive children led to the expectation that indirect measures of hyperactivity should correlate significantly with objective measures of activity level. In view of the shift that has occurred in conceptualizing ADD/hyperactivity as involving inappropriate activity, rather than excessive activity, the WWPARS would be expected to correlate significantly with estimates of conduct disturbance, and not with measures of total activity.

Another scale was developed by Routh, Schroeder, and O'Tuama (1974). This scale is a 22-item shortened version of the WWPARS scale; the items related to homework and school behavior are omitted. The researchers reported a median interparent correlation of .33 for 140 pairs of parents of "normal" children aged 3–9 years. Routh *et al.* (1974) also provided norms for these age groups.

The Conners Parent Questionnaire (PQ; see Figure 3) originally consisted of 93 items, from which Conners (1970) obtained six factors: (1) aggressive conduct disorder; (2) anxious-inhibited; (3) antisocial; (4) enuresis; (5) psychosomatic; and (6) anxious-mature. Eight factors were obtained shortly thereafter by Conners, (Conners, Taylor, Meo, Kurtz, and Fournier (1972) in a factor analysis that dropped the enuresis factor and added factors of impulsiveness, obsessiveness, and hyperactivity. The most frequently used version of the PQ is a 48-item scale yielding five factors: conduct problem, learning problem (attentional and distractibility problems), psychosomatic, impulsive-hyperactive, and anxiety (Goyette *et al.*, 1978). A global score, called the *hyperkinesia index*, can also be calculated. Items on the PQ are rated on a 4-point scale like the response format of the Conners Teacher Rating Scale. Goyette *et al.* (1978) reported satisfactory interrater reliabilities for this scale, with product-moment correlations between mother and father ratings ranging from .46 to .57, and a mean correlation of .51. All correlations were found to be significant ( $p < .001$ ), and there were no significant differences between mother and father ratings.

The hyperkinesia index is comprised of 10 items and has been shown to be sensitive to treatment effects (e.g., Conners, 1972; Sprague & Sletor, 1973). Interrater parent correlations for this index are satisfactory ( $r = .55$ ;  $p < .001$ ). Parent-teacher interrater correlations are also acceptable—although lower than those found in the mother-father comparisons. It should also be noted that the correlations between scores obtained on the hyperkinesia indices of the Conners PQ and TRS were relatively high ( $r = .49$ ). Normative data for the PQ are presented in Table 6. Goyette *et al.* (1978) reported that age and sex effects are significant determinants of scores obtained from this scale, and that these variables should be taken into consideration when interpreting the results. For example, boys tend to be rated as having more problems than girls, and scores tend to decrease with age (Barkley, 1981a). Finally, as it has been suggested that rating scales of this type are unstable across time because of practice and/or regression effects (Werry & Sprague, 1974), Goyette *et al.* (1978) recommended that the same parent should complete all administrations of the questionnaire if this scale is to be used for repeated measures.

The Behavior Problem Checklist (BPC; Quay & Peterson, 1979) has been widely used as a screening and diagnostic instrument, as a measure of treatment effects, and as a means of selecting contrasting groups of subjects for research relating to the different dimensions of childhood and adolescent behavior disorders. However, a revision of the BPC was begun in 1980 in order to strengthen the psychometric properties of the scale (see Quay, 1983, for a review). The Revised Behavior Problem Checklist (RBPC) is composed of four major and two minor scales. The major scales are Conduct Disorder (CD), with 22 items; the Socialized Aggression (SA) scale, with 17 items; the Attention Problems-Imma-

## Parent's Questionnaire

Name of Child \_\_\_\_\_

Date \_\_\_\_\_

Please answer all questions. Beside *each* item below, indicate the degree of the problem by a check mark (✓)

	Not at all	Just a little	Pretty much	Very much
1. Picks at things (nails, fingers, hair, clothing).				
2. Sassy to grown-ups.				
3. Problems with making or keeping friends.				
4. Excitable, impulsive.				
5. Wants to run things.				
6. Sucks or chews (thumb; clothing; blankets).				
7. Cries easily or often.				
8. Carries a chip on his shoulder.				
9. Daydreams.				
10. Difficulty in learning.				
11. Restless in the "squirmy" sense.				
12. Fearful (of new situations; new people or places; going to school).				
13. Restless, always up and on the go.				
14. Destructive.				
15. Tells lies or stories that aren't true.				
16. Shy.				
17. Gets into more trouble than others same age.				
18. Speaks differently from others same age (baby talk; stuttering; hard to understand).				
19. Denies mistakes or blames others.				
20. Quarrelsome.				
21. Pouts and sulks.				
22. Steals.				
23. Disobedient or obeys but resentfully.				
24. Worries more than others (about being alone; illness or death).				
25. Fails to finish things.				
26. Feelings easily hurt.				
27. Bullies others.				
28. Unable to stop a repetitive activity.				
29. Cruel.				
30. Childish or immature (wants help he shouldn't need; clings; needs constant reassurance).				
31. Distractibility or attention span a problem.				
32. Headaches.				
33. Mood changes quickly and drastically.				
34. Doesn't like or doesn't follow rules or restrictions.				
35. Fights constantly.				
36. Doesn't get along well with brothers or sisters.				
37. Easily frustrated in efforts.				
38. Disturbs other children.				
39. Basically an unhappy child.				
40. Problems with eating (poor appetite; up between bites).				
41. Stomach aches.				
42. Problems with sleep (can't fall asleep; up too early; up in the night).				
43. Other aches and pains.				
44. Vomiting or nausea.				
45. Feels cheated in family circle.				
46. Boasts and brags.				
47. Lets self be pushed around.				
48. Bowel problems (frequently loose; irregular habits; constipation).				

FIGURE 3. Conners Parent Rating Scale. Copyright 1970 by Abbott Laboratories. Reprinted with permission.

turity (AP) scale, with 22 items; and the Anxiety-Withdrawal (AW) scale, consisting of 11 items. The two minor scales are Psychotic Behavior (PB), with 6 items, and the Motor Excess (ME) scale, with 5 items. Behavioral descriptors such as "distractible; easily diverted from the task at hand" (from the AP scale) are scored on a 3-point scale (0 = not a problem; 1 = a mild problem; 2 = a severe

TABLE 6. Normative Data on the Conners Parent Questionnaire<sup>a</sup>

Age category	(N)	I. Conduct problem		II. Learning problem		III. Psychosomatic		IV. Impulsive-hyperactive		V. Anxiety		Index	
		X	(SD)	X	(SD)	X	(SD)	X	(SD)	X	(SD)	X	(SD)
3-5	(74)	.51	(.37)	.55	(.44)	.08	(.16)	1.06	(.70)	.61	(.60)	.74	(.46)
6-8	(133)	.46	(.36)	.56	(.43)	.16	(.25)	.94	(.59)	.58	(.65)	.42	(.60)
9-11	(128)	.48	(.37)	.55	(.48)	.17	(.27)	.87	(.59)	.45	(.52)	.60	(.40)
12-14	(122)	.44	(.41)	.55	(.52)	.22	(.37)	.77	(.54)	.56	(.56)	.55	(.40)
15-17	(72)	.43	(.39)	.49	(.49)	.16	(.26)	.65	(.53)	.56	(.55)	.47	(.38)
M	(291)	.51	(.40)	.62	(.49)	.15	(.29)	.89	(.59)	.54	(.55)	.65	(.44)
F	(238)	.41	(.35)	.45	(.43)	.18	(.26)	.83	(.61)	.53	(.58)	.55	(.39)
By Sex													
Males by Age													
3-5	(45)	.53	(.39)	.50	(.33)	.07	(.15)	1.01	(.65)	.67	(.61)	.72	(.40)
6-8	(76)	.50	(.40)	.64	(.45)	.13	(.23)	.93	(.60)	.51	(.51)	.69	(.46)
9-11	(73)	.53	(.38)	.64	(.52)	.18	(.26)	.92	(.60)	.42	(.47)	.66	(.44)
12-14	(59)	.49	(.41)	.66	(.57)	.22	(.44)	.82	(.54)	.58	(.59)	.62	(.45)
15-17	(38)	.47	(.44)	.62	(.55)	.13	(.26)	.70	(.51)	.59	(.58)	.51	(.41)
Females by Age													
3-5	(29)	.49	(.35)	.62	(.57)	.10	(.17)	1.15	(.77)	.51	(.59)	.78	(.56)
6-8	(57)	.41	(.28)	.45	(.38)	.19	(.27)	.95	(.59)	.57	(.66)	.59	(.35)
9-11	(55)	.40	(.36)	.43	(.38)	.17	(.28)	.80	(.59)	.49	(.57)	.52	(.34)
12-14	(63)	.39	(.40)	.44	(.45)	.23	(.28)	.72	(.55)	.54	(.53)	.49	(.34)
15-17	(34)	.37	(.33)	.35	(.38)	.19	(.25)	.60	(.55)	.51	(.53)	.42	(.34)

Note. From "Normative Data on the Revised Conners Parent and Teacher Rating Scales" by C. H. Goyette, C. K. Conners, and R. F. Ulrich, *Journal of Abnormal Child Psychology*, 1978, 6, 221-236. Copyright 1978 by Plenum Press. Reprinted with permission.

<sup>a</sup>The cumulative percentage distributions of parent and teacher mean factor scores may be obtained by writing to the authors.

problem). The maximum possible score for a given scale is therefore two times the number of scale items, and the minimum possible score is zero.

Comparison with DSM-III of the behavioral descriptors in each scale of the RBPC suggests that ADD is represented by the Attention Problems-Immaturity scale, and that the added diagnosis of "with" or "without" hyperactivity is determined by examining a child's score on the Motor Excess scale (Quay & Peterson, 1983). The AP scale reflects difficulties in concentration, impulsivity, perseverance, and ability to follow directions. Based on findings from the use of a peer nomination technique, the Pupil Evaluation Inventory (Pekarik, Prinz, Leibert, Weintraub, & Neale, 1976), it was found that peer ratings of Likability were significantly and negatively correlated with scores on the AP scale of the RBPC (Ledingham, Younger, Schwartzman, & Bergeron, 1972). This finding is consistent with those research findings that have identified a pattern of poor peer relations among ADD/hyperactive children. It has also been found that, when ability is partialled out, the only RBPC subscale to consistently demonstrate a negative relationship with achievement is the AP scale. Quay and Peterson (1983) felt that these findings serve to strengthen the validity of this subscale as a measure of attentional problems and immaturity.

The AP subscale of the RBPC correlates highly with the inadequacy-immaturity subscale of the original BPC—based on ratings obtained from parents, teachers, and institutional staffers on samples of "normal" children and inpatients. Because of the high correlations observed between these and other subscales of the revised and original BPC (except for the psychotic behavior scale), Quay and Peterson (1983) suggested that most of the results that have been reported in the validation studies of the BPC may be generalized to the RBPC.

The interrater reliability data for the RBPC are limited, but based on ratings from 10 teachers of a sample of 172 children in a community-sponsored school for learning-disabled children, the average intercorrelations among raters were .53 for the AP scale and .58 for the ME scale. Test-retest reliability based on teacher ratings two months apart found rater-rerater correlations of .83 for the AP scale and of .68 for the ME scale (Quay & Peterson, 1983). Scores from these scales were found to be significantly lower at the second testing. As mentioned earlier, however, this finding is in accord with those results obtained for other rating scales (e.g., the Conners Teacher Rating Scale)—suggesting a practice effect or regression toward the mean. Although the RBPC appears to be a psychometrically robust instrument, further research is needed to demonstrate its ability to differentiate between ADD/hyperactive, ADD/nonhyperactive, and "normal" children.

In this regard, a series of interesting studies have been published in recent years by Lahey and his associates (e.g., Lahey, Schaughency, Frame, & Strauss, 1985; Lahey, Schaughency, Strauss, & Frame, 1984). In one study, Lahey *et al.* (1984) differentiated between ADD/hyperactive and ADD/nonhyperactive children using the RBPC. They found that the ADD/hyperactive children were more irresponsible, sloppy, distractible, impulsive, likely to answer without thinking, and fast in finishing classroom assignments than were the ADD/nonhyperactive or "normal" control children. In addition, the ADD/nonhyperactive children

were found to be rated as more sluggish and drowsy than either the ADD/hyperactive or the "normal" control children. In another study, Lahey *et al.* (1985) found that ADD/hyperactive children had significantly higher scores on the Conduct Disorder, Socialized Aggression, and Psychotic Behavior factors of the RBPC than ADD/nonhyperactive and "normal" control children. On the other hand, the ADD/nonhyperactive children were significantly higher on the Anxiety-Withdrawal factor than the "normal" control children, and no significant differences were found between the two ADD groups of children.

The Personality Inventory for Children (PIC) is an empirically derived, multidimensional measure providing descriptions of child behavior, affect, and cognitive status (e.g., Wirt, Lachar, Klinedinst, & Seat, 1984). The most current revised format (see Lachar & LaCombe, 1983, for a review) includes 600 items divided into four sections of 131, 280, 420, and 600 items. The completion of successive sections increases the number of scales available for scoring. The revised PIC profile form includes four broad-band scales (I, Undisciplined/Poor Self Control; II, Social Incompetence; III, Internalization/Somatization; and IV, Cognitive Development); validity scales (LIE; F; Defensiveness, DEF); a screening scale (Adjustment, ADJ); and 12 clinical scales (Achievement, ACH; Intellectual Screening, IS; Development, DVL; Somatic Concern, SM; Depression, D; Family Relations, FAM; Delinquency, DLQ; Withdrawal, WDL; Anxiety, ANX; Psychosis, PSY; Hyperactivity, HPR; and Social Skills, SSK).

Several approaches to analyzing and interpreting the revised PIC profile have been recommended by Lachar and his associates. First, a child's profile can be studied by means of a linear scanning approach—examining each scale individually and attributing to the child those behavioral characteristics that are predicted for a specific *t*-score elevation on a particular scale (e.g., Lachar, 1982; Lachar & Gdowski, 1979). Second, a configural approach to interpretation can be undertaken whereby a child's particular profile can be compared with hypothesized profile configurations that have been identified for such groups as psychotic, retarded, hyperactive, and delinquent children (DeHorn, Lachar, & Gdowski, 1979). Third, interpretation can involve the comparison of an individual profile with the mean profiles obtained from criterion samples. For example, the generation of a mean profile from a criterion sample of children identified as hyperactive (Hegeman, 1976) reveals that hyperactive boys tend to have peak elevations on the Hyperactivity scale, the Delinquency scale, the Adjustment scale, and the Social Skills scale. The mean profiles were also suggestive of elevations between 60T and 69T on the Achievement and Development scales, as well as scores of 69T or higher on the Social Skills scale.

Test-retest reliability of the HPR scale has been reported to range from .76 to .89. A cross-validation study replicating the diagnostic accuracy of the HPR scale was reported by Breen and Barkley (1983). Research findings have also suggested that the PIC/HPR scale is sensitive to the effects of stimulant medication (e.g., Voelker, Lachar, & Gdowski, 1983).

Peer ratings of ADD/hyperactivity have also been developed in recent years to provide cross-validation for teacher and parent ratings, as well as to discriminate rater and context effects. Studies examining the interjudge agreement for

parent and teacher rating scales of ADD/hyperactivity suggest that rater bias and halo effects are inherent difficulties to be considered in interpreting the results of rating scales (e.g., Glow, 1981; Goyette *et al.*, 1978). By using peer raters in the classroom setting, the potential exists for reducing rater bias, as it appears that children are not as susceptible as adult raters to rater leniency effects (Pekarik, Prinz, Leibert, Weintraub, & Neale, 1976).

Glow and Glow (1980) constructed the Peer Rating Scale based on the Pupil Evaluation Instrument described by Pekarik *et al.* (1976). The items from the Pupil Evaluation Instrument were rewritten into a question format, and items tapping into activity, impulsivity, restlessness, and inattention were added to form the 50-item Peer Rating Scale. A cluster analysis yielded six scales with high internal consistency, suggesting scale stability when multiple raters are used. The scales included were Shy-Sensitive, Inconsiderate, Hyperactive, Effective, Popular, and Bully. Some examples of items from the Hyperactive scale include those measuring "restlessness" ("Who can't sit still?" and "Who fidgets with things?") and "inattention" ("Who doesn't pay attention to the teacher?"). Peer raters in the study were asked to apply these questions to specific children in their class, and then to rate the questions that applied to themselves in order to obtain self-ratings. Glow and Glow (1980) reported that the only self-ratings that demonstrated convergent and discriminant validity with respect to peer ratings were those of hyperactivity. Peer ratings of hyperactivity on the Peer Rating Scale correlated very highly ( $r = .93$ ) with teacher ratings of Hyperactive-Inattentive obtained from the TRS (Conners, 1976). Correlations between the Peer Rating Scale and parent ratings based on the 96-item Conners Parent Rating Scale were not as high as those found between peers and teachers. Peer ratings of hyperactivity correlated significantly with parent ratings of Immature-Inattentive ( $r = .52$ ;  $p < .05$ ), but correlations were low with parent ratings of Hyperactive-Impulsiveness ( $r = .31$ ).

Although the Peer Rating Scale instrument appears to have good reliability, it does not appear to provide a precise measurement of ADD/hyperactivity because high intercorrelations were found between the Hyperactivity scale and the Inconsiderate and Effective scales. Nevertheless, ratings obtained with this measure enable clinicians to differentiate effects on behavioral ratings due to context and rater effects. It may be concluded from this research that the high intercorrelations between teachers and peers suggests the importance of the context in which a behavior is rated. This helps explain the common finding that parent and teacher ratings usually have low correlations on ratings of child behavior problems (Glow & Glow, 1980). The ethical issues associated with including a child's peers in the behavioral assessment process must also be addressed before one implements this method.

### *Direct Classroom Observations*

The behavioral pattern typically identified for ADD/hyperactive children includes attention deficits (Douglas, 1972), excess motor activity (Werry & Sprague, 1970), impulsivity (Blunden, Spring, & Greenberg, 1974), and ag-

gressive behavior (Conners *et al.*, 1972). These behavioral characteristics lend themselves well to observational methods of assessment. Observation codes are less susceptible to the problems of low reliability, halo effects, or rater bias—difficulties associated with behavior rating scales (e.g., Kent, O'Leary, Diament, & Dietz, 1974; Morris & Kratochwill, 1983). The operational nature of the behavioral definitions used in observation scales also (1) helps decrease criterion error variance (Abikoff, Gittelman-Klein, & Klein, 1977) and (2) can provide information about the antecedents and consequences of target behaviors that can be helpful in designing behavioral interventions (Barkley, 1981b). The use of observational codes may be time-consuming and expensive, and if adequate sampling is not conducted and the behaviors rated are variable, the data obtained may be invalid (Abikoff *et al.*, 1977). Reactive effects to being observed may also jeopardize external validity, and users must be aware of the potential of observer drift. For example, Reid (1970) reported that, when observers did not expect the accuracy of their ratings to be monitored, the reliability of their observations decreased.

Extensive validation studies of observational methods for the assessment of ADD/hyperactivity have been reported by Blunden *et al.* (1974) and Abikoff *et al.* (1977). For example, Blunden *et al.* (1974) developed a 10-category observation coding system based on the Classroom Behavior Inventory (Greenberg, Deem, & McMahon, 1972). Abikoff *et al.* (1977) developed a classroom observation coding system based on the Stony Brook Code (Tonick, Friehling, & Warhit, 1973). Their revised Stony Brook Observation Code consists of 14 behavioral categories that are sampled every 15 seconds. A modified time-sampling procedure is used in which nontimed behaviors are scored when they occur during the interval (although only once per interval). Timed behaviors, on the other hand, are scored when the child engages in the described behavior for more than 15 consecutive seconds (overlap may occur between time intervals). Phi coefficients used as measures of interobserver reliability range from .34 to .93 ( $X = .76$ ) for the 14 categories. Significant differences were observed between ADD/hyperactive and control children on 12 of the 14 behavior categories. This observational system, however, has been criticized for (1) its failure to measure antecedent and consequent events and (2) its neglect of observing teacher and peer interactions (Barkley, 1981b).

The Hyperactive Behavior Observation System (HBOS; Vincent, Williams, Harris, & Duval, 1981) involves the collection of videotaped samples of a child's classroom behavior and the subsequent coding of these samples in a laboratory setting. This procedure is quite different from observational systems that require observers to make their ratings within the classroom setting. This coding system consists of 34 categories that refer to social and motor behaviors. Categories that take into account the child's interactions with his or her teacher and peers are also included, as is a category referring to the teacher's interactional style.

### *Direct Analogue Observations*

Methods for assessing parent-child interactions by means of clinical analogue observations have been described extensively in the literature (e.g., Bark-



ley, 1981b; Barkley & Cunningham, 1979; Humphries, Kinsbourne, & Swanson, 1978). For example, Barkley (1981b), using an adaptation of Hanf's procedure, places the parent and child in a playroom and instructs them to play as they would at home for 15 minutes. Following this free play period, a 15-minute task period takes place, during which the parent is given a list of three commands to give to the child—commands that are generally difficult for ADD/hyperactive children to comply with. The commands are (1) stopping an enjoyable activity (free play) and performing an undesirable activity (picking up the toys); (2) completing sustained paper-and-pencil tasks; and (3) not interrupting the parent while restricting one's own activities.

Two coders record observations behind a one-way mirror using the Response Class Matrix (Mash, Terdal, & Anderson, 1973); one scores the mother's behaviors and the child's responses, and the other scores the child's behaviors and the mother's responses. Behavior is sampled at 15-second intervals. The categories used in coding for the mother are command, command-question, question, praise, negative, interaction, and no response. The child's categories are compliance, independent play, question, negative, interaction, and no response. A category variable of "competing" is included as an antecedent behavior for the child. The same behaviors are rated by each coder, although only one views the mother's behaviors as antecedent, and the other views it as consequent (and the same for the child). The coder observing the child-antecedent and mother-consequent interaction scores the child-antecedent behavior of "competing." A total of 120 interactions is coded; 60 are recorded during free play, and 60 during the task period. Intercoder reliabilities are quite high, ranging from .80 to .98 for different behavior categories (Barkley, 1981b). Interaction measures during the task period, particularly the command and compliance categories, have been found to be sensitive to drug treatment (e.g., Cunningham & Barkley, 1978) and correlate with parent rating scales of ADD/hyperactivity (Barkley & Cunningham, 1979).

Whalen and Henker (1984) described a system for observing peer interactions in quasi-naturalistic situations. One strategy involves the observation of a child during a structured interaction game called "Adventure." This situation is designed to simulate natural social situations that require mutual problem-solving, sharing, positive assertion, and compromise. The game involves intergalactic adventures, such as searching for lost star spaceships and engaging in hazardous confrontations with enemy spaceships. The innovative, contemporary, and creative nature of the tasks is intended to make the game engaging enough to elicit representative social behaviors. The coding systems that are used are intended to identify those social behaviors that are most responsive to stimulant medication and those that discriminate between ADD/hyperactive and non-ADD/hyperactive children.

## TRADITIONAL ASSESSMENT APPROACHES

Traditional approaches to the assessment of ADD/hyperactivity include measures of cognitive styles, simple performance tests, temperament measures,

measures of attention, measures of physical activity, and intelligence tests. The theoretical rationale behind most of these approaches is that the behaviors being assessed reflect the underlying causes associated with ADD/hyperactivity.

### *Cognitive Styles*

Rather than identifying differences in intelligence or specific cognitive abilities, evaluation of cognitive styles takes into account interindividual differences in the manner in which a person approaches a particular problem. ADD/hyperactive children have been reported to have difficulties that are reflected in several types of cognitive styles, including impulsivity, field dependence, and constricted control/distractibility (e.g., Hechtman, Weiss, Perlman, Hopkins, & Wener, 1981).

*Impulsivity-reflectivity* is a cognitive style that is relevant in situations where the child must make a choice between several alternatives when the response is uncertain (Kagan, Rosman, Day, Albert, & Phillips, 1964). This style has been measured with a visual matching test called the Matching Familiar Figures Test (MFFT). Kagan (1965b) reported a consistent negative correlation between response speed and accuracy, thereby suggesting that impulsive subjects respond more quickly and commit more errors than reflective subjects. Children are classified as "impulsive" if they score above the median in number of errors and below the median in reaction time; and as "reflective" if their latencies fall above the median and their error scores are below the median (Kagan, 1965c). The literature regarding the construct validation of this instrument has been extensive. For example, using a sample of 19 hyperactive and 19 matched control children ranging in age from 5 to 11 years (mean age = 7.9), Campbell *et al.* (1971) found that hyperactive children have significantly shorter latencies and make significantly more errors than do "normal" children. Using the Kagan (1965c) labeling criteria, Campbell *et al.* (1971) found a significant correlation between group membership and impulsive or reflective style. They also reported the MFFT to be sensitive to the drug treatment of ADD/hyperactive children. These findings have also been confirmed in other studies with ADD/hyperactive children (see, for example, Cohen, Weiss, & Minde, 1972; Rapoport, Quinn, Bradbarb, Riddle, & Brooks, 1974; Schleifer, Weiss, Cohen, Elman, Cvjic, & Kruger, 1975).

The internal consistency and test-retest reliability values reported for the MFFT have been adequate (e.g., Ault, Mitchell, & Hartmann, 1976; Egeland & Weinberg, 1976)—although by most psychometric standards, these values would be viewed as only low to moderate (Cairns & Cammock, 1978). In an attempt to improve the reliability of the MFFT error scores, Cairns and Cammock (1978) developed the MFF20. The MFF20, as the name implies, is an expanded version of the MFFT consisting of 20 test items. The split-half correlations that have been reported over a two-week period were .89 for error and .91 for latency. Test-retest correlations calculated over a five-week interval were .77 for errors and .85 for latency. In addition to improved reliability, the MFF20,

unlike the MFFT, has the additional advantage of lacking a significant correlation with verbal intelligence.

A second cognitive style that has been related to ADD/hyperactivity is Witkin's dimension (1959) of *field dependence* or *independence*. This style refers to the capacity of a person to separate an item from the field in which it is embedded. It also differentiates the degree to which a person's perception is global or analytic (Witkin, 1959; Witkin, Dyk, Faterson, Goodenough, & Karp, 1962). Witkin *et al.* (1962) suggested that because field-dependent children tend to respond globally to the most compelling features of a stimulus field, children who manifest behaviors characteristically attributed to ADD/hyperactive children should be field-dependent. The Children's Embedded Figures Test (EFT; Karp & Konstadt, 1963) has been widely used as a measure of field dependence and independence. In the ADD/hyperactivity literature, the EFT has been used as a measure of the attention or distractibility component of a child's impulse control. Campbell *et al.* (1971), for example, suggested that field-dependent children would have greater difficulty than field-independent children in locating a figure embedded within a distracting context. The research literature appears to support the contention that ADD/hyperactive children are more field-dependent than "normal" control children, and that the EFT does not seem to be sensitive to drug treatment (see, Sandoval, 1977, for a review of this literature).

The third cognitive style linked to ADD/hyperactivity is *constricted* or *flexible control*, which involves the child's ability to ignore distracting and contradictory stimuli and to inhibit incorrect verbalizations (e.g., Gardner & Long, 1962; Klein, 1954). Because of the poor impulse control and the attentional difficulties observed in ADD/hyperactive children, it has been suggested that they should exhibit constricted control of attention (or distractibility).

A measure used to assess constricted versus flexible control is the Colour Distraction Test (Santostefano & Paley, 1964). This test requires the subjects to name the colors of items in the presence of distracting stimuli, either in the form of peripherally distracting cues (e.g., familiar pictures bordering the card), or by presenting objects in a contradictory color and asking for the subject to name the correct color of the object (e.g., presenting a blue banana; the subject's correct response would be "yellow"). Three scores are obtained from this test: (1) a distractibility score; (2) an interference score, and (3) a types-of-errors score (errors of omission, partial errors of commission, and complete errors of commission). Measures of distractibility and interference were not found to discriminate between hyperactive and "normal" children (Campbell *et al.*, 1971; Cohen *et al.*, 1972) and were not drug-sensitive (Campbell *et al.*, 1971). The only significant finding by Campbell *et al.* was that hyperactive children made more complete errors of commission and fewer partial errors of commission than "normal" controls, and that their performance improved with drug treatment (methylphenidate). Sandoval (1977) suggested that these indices may be measuring impulsivity, and that Douglas (1972) may have been correct in asserting that ADD/hyperactive children have shorter attention spans but are not any more distractible than "normal" children when they are attending to a task.

### *Bender Visual Motor Gestalt Test*

The Bender Visual Motor Gestalt Test (Bender, 1938; Koppitz, 1964) is one of the projective and perceptual-motor assessment instruments most frequently used with children. The Bender Gestalt test is purported to measure perceptual accuracy and motor coordination. To score well on this test, a child should be able to plan and monitor his or her own behavior and to attend to details (Koppitz, 1964). Some clinicians therefore assume that some estimate of a child's attentional abilities and impulsivity may be derived from the use of the Bender test. Kagan (1965a) reported a correlation of approximately .70 between Bender scores and the average latency to the first response on the MFFT, and impulsive children were found to make more errors than reflective children in their Bender reproductions. Brannigan, Barone, and Margolis (1978) identified several individual signs from the Bender as being significantly related to impulsivity: increased or decreased loops (Figure 4 or 6); uneven or irregular curves; loops for circles; and dots for circles or circles for dots. However, based on their review of the literature, Tolor and Brannigan (1980) concluded that the cognitive style of impulsivity does not influence developmental interpretations based on quantitative determinants, but that impulsivity does appear to be reflected in qualitative interpretations of the Bender.

Other studies using the Bender gestalt test have not shown this measure to differentiate between ADD/hyperactive and normal children (e.g., Adams, Hayden, & Canter, 1974; Palkes & Stewart, 1972) or to be sensitive to drug treatment (see Sandoval, 1977, for a review). This instrument, therefore, appears to have limited utility in the assessment of ADD/hyperactive children for purposes of differential diagnosis.

### *Temperament*

The intensified interest in the areas of behavioral genetics and the search for biochemical correlates of developmental phenomena have led researchers to direct more attention to documenting constitutional differences in children, as well as to developing measurement instruments for assessing temperament variables (e.g., Martin, 1983). Thomas and Chess (1977) identified nine temperamental variables in children: intensity, threshold, activity, rhythmicity, adaptability, approach/withdrawal, distractibility, persistence, and mood. Based on longitudinal studies of the interrelationships among these temperament traits, several general personality types have been distinguished ("easy," "slow to warm up," and "difficult").

Temperament research has focused on the relationship between temperament traits and cognitive ability, academic achievement, and the manifestation of maladaptive symptoms (see Martin, 1983, for a review). Few studies, however, have been aimed at demonstrating the relationship between specific temperamental variables and a specific behavior problem. One notable exception is the work of Lambert and Windmiller (1977), who sought to determine whether the "difficult" child pattern (Thomas, Chess, & Birch, 1970) corresponded to the

ADD/hyperactive child. It was expected that ADD/hyperactive children would lack persistence, be distractible, react intensely, have high activity levels, and have a low threshold of responsiveness. These investigators developed a temperament interview for parents based on the work of Thomas *et al.* (1970). The results of this study showed that the temperamental trait of distractibility differentiated ADD/hyperactive from non-ADD/hyperactive peers (including those with adjustment problems and low achievers).

Although parent interviews have been used at times, most temperament assessment generally involves the use of parent questionnaires. Most are based on the temperamental dimensions identified by Thomas and Chess (1977), and assessment instruments are available to determine temperament from infancy through childhood. Overall, these global perceptions of children have been found to be less accurate and less stable than specific behavioral ratings. Bates (1980) argued, however, that, by abandoning global measures of temperament for more objective measures, we sacrifice the predictive validity afforded by parental perceptions of temperament.

### *Measures of Attention*

Attention levels in children have traditionally been assessed within laboratory settings, as it has been difficult for researchers to measure attentional performance in classroom settings (Whalen, 1983). Unlike findings that have reported that distractibility is somewhat situation-specific, research on the inability of ADD/hyperactive children to sustain attention has demonstrated stability across time and situations (e.g., Porges & Smith, 1980).

The Serial Reaction Task and the Continuous Performance Test have each been used to study the ability of ADD/hyperactive children to sustain attention for prolonged periods of time; these assessment methods have satisfactory test-retest reliability (Sykes, Douglas, & Morganstern, 1973). In the Serial Reaction Task, the child's performance is self-paced, and the stimuli to which the child is to respond remain present until the response has been made. The stimuli consist of lights, each of which has a corresponding push button. As a light goes on, the child is required to push the button associated with that light in order to turn it off. Once a response has been made, another light appears in random order, and this process continues for nine minutes. Children are scored on the number of correct and incorrect responses. It has been found that ADD/hyperactive children make significantly more incorrect responses than "normal" controls, although the two groups do not differ with respect to mean correct responses (Sykes *et al.*, 1973).

Similarly, on the Continuous Performance Test (CPT; Rosvold, Mirsky, Sarason, Bransome, & Beck, 1956), Sykes *et al.* (1973) found that ADD/hyperactive children made more incorrect and fewer correct responses than control children, and that the performance of the ADD/hyperactive children declined markedly over time. In evaluating the types of errors made, it was discovered that ADD/hyperactive children tended to make significantly more anticipatory errors (responding to the significant stimulus before it appeared) and random

responses (responding to nonsignificant stimuli) than did the control subjects. These findings suggested that ADD/hyperactive children respond impulsively and confirmed earlier findings that these children detected fewer significant stimuli on the Continuous Performance Test than did "normal" matched controls (Sykes, Douglas, Weiss, & Minde, 1971).

A computerized version of the CPT has also been used in the investigation of attention deficits (Klee & Garfinkel, 1983). Preliminary findings suggest that performance on the computerized CPT correlate significantly with other psychometric and behavioral measures of ADD/hyperactivity, impulsivity, and inattention. Omission errors on the CPT correlated with the arithmetic subtest of the WISC-R, which has been viewed as a measure of sustained attention (Kaufman, 1979). Poor CPT responders were also found to exhibit many of the symptoms of ADD/hyperactivity as identified on the Conners TRS, but because of the limited sample used in this study, investigators were unable to determine whether there was a clearly distinguishable pattern on the CPT for ADD/hyperactive children. This study, however, supported the use of the computerized CPT as a screening instrument for attentional difficulties.

### *Activity Level Measures*

As ADD/hyperactivity has changed from being viewed as a disorder that involves chronic and excessive overactivity to being viewed as involving inappropriate activity, the use in research studies of physical measures of activity level has also declined. Three devices, however, have been used with considerable frequency in the research literature and merit discussion here: the activity recorder, the actometer, and the stabilmetric cushion. The activity recorder is a device similar to the pedometer, and it attaches to the back of a child's shirt. It has been reported to distinguish between teacher-rated ADD/hyperactive and non-ADD/hyperactive boys (e.g., Victor, Halverson, Inoff, & Buczkowski, 1973); however, it has not been found to be sensitive to drug treatment, and as a measure, it has only moderate reliability (e.g., Rapoport *et al.*, 1971).

The actometer is a modified wristwatch that measures movement. This instrument has been used in several studies assessing the relative effectiveness of drug therapy for reducing activity level in ADD/hyperactive children. For example, Millichap, Aymat, Sturgis, Larsen, and Egan (1968) found that this measure, though not differentiating intrasubject changes due to medication, was able to differentiate between experimental groups on medication. In addition, Millichap and Johnson (1974) reported that, when the attention of children on Ritalin is focused, there is a decrease in the actometer measure. In addition, Buss, Block, and Block (1980) used the actometer in a longitudinal study of the behavioral concomitants of high activity level in preschool children. These researchers found that highly active preschoolers are at risk for developing difficulties with interpersonal relationships and for impulsivity.

The stabilmetric cushion is a seat pad containing microswitches that measure a child's "wiggling" or "squirming" while seated in a chair. This instru-

ment has been found to differentiate between groups of children (Sykes *et al.*, 1971) and to be sensitive to stimulant drug treatment (Sprague *et al.*, 1970). The expense and the obtrusive nature of this measure, as well as the questionable reliability of the two previously discussed activity measures, have led some writers (e.g., Sandoval, 1977) to suggest that researchers and clinicians use assessment instruments other than these activity level devices.

### *Intelligence Tests*

Standardized tests of intelligence are instruments commonly used in the psychological assessment of behavior disorders in children. The Wechsler Intelligence Scale for Children-Revised (WISC-R), for example, has been used to differentiate ADD/hyperactive children and other groups of children. This test provides information to the examiner concerning areas of functioning in which ADD/hyperactive children have difficulties, such as distractibility, inattention, short-term memory, judgment, and overall responsivity to structured tasks (see Baxley & LeBlanc, 1976). Interpretation of the WISC-R has tended to involve the Comparison of Verbal and Performance IQs and a pattern analysis of scores derived from individual subtests. Numerous factor-analytic studies have been performed with the WISC-R, and they have consistently identified three major factors: a factor that has been labeled as Inattention-Memory, consisting of the Information, Arithmetic, Digit Span, and Coding subtests (Milich & Loney, 1979); Attentional-Concentration, consisting of the Arithmetic, Digit Span, and Coding subtests (Witkin *et al.*, 1962); and the Distractibility Factor, consisting of the Arithmetic, Digit Span, and Coding subtests (Kaufman, 1979).

Investigators have suggested that the inattention factor plays a significant role in accounting for the performance of ADD/hyperactive children on the WISC-R scales. In addition to getting lower scores on the Distractibility and/or Inattention factors, it has also been reported that ADD/hyperactive children tend to score low on Comprehension and significantly above the mean on the Object Assembly and Similarities subtests (e.g., Milich & Loney, 1979). The low Comprehension score, for example, was considered consistent with difficulties in interpersonal relationships demonstrated by ADD/hyperactive children. On the other hand, the higher scores on Object Assembly and Similarities were thought to reflect a global strategy for information processing—a strategy that has been associated with impulsive children (e.g., Zelniker & Jeffrey, 1976).

Despite findings that scores on the Distractibility Factor are characteristically low for ADD/hyperactive children, as well as for reading-disabled and learning-disabled children (see, for example, Kaufman, 1979), there is no particular WISC-R pattern that can clearly differentiate ADD/hyperactive from learning-disabled children (Sattler, 1982). However, that the WISC-R does provide valuable information about the cognitive and behavioral functioning of ADD children that, on an individual therapeutic and/or educational basis, could be useful in the development and monitoring of an intervention program.

## SUMMARY AND CONCLUSIONS

In this chapter, we have reviewed the diagnosis and assessment literature on attention deficit disorder and hyperactivity, as well as literature pertaining to prevalence, incidence, and etiology. It is clear from this review that ADD/hyperactivity is a frequently diagnosed behavior disorder of unknown etiology that has been assessed in a variety of ways from both a behavioral and a traditional viewpoint. The behavioral approach focuses on the assessment of environmental and person–environment factors, whereas traditional approaches have concentrated on the assessment of underlying psychological factors and constructs. Thus, behavioral approaches might assess parent–child or teacher–student interactional styles and/or might have parents or teachers fill out behavior rating scales or checklists on a child that are tied to particular environments, whereas traditional approaches might use instruments to assess such transsituational constructs as activity level, impulsivity, distractibility, and level of attention.

Behavioral approaches to the assessment of ADD/hyperactivity have typically involved the use of the following: interview assessment, using formats that are either standardized in the questions asked and the content covered, moderately standardized, or unstandardized; behavior ratings and checklists, on which the respondent (parent, teacher, or peer) is asked to rate a child based on the respondent's past observations of the child's behavior; direct classroom observation, in which a person directly observes a child in the classroom for a specific period of time and rates the child's behavior according to a predetermined coding system; and direct analogue observation, in which the observer establishes a play environment for a parent and child and then instructs the parent to behave in certain ways with the child while the observer records his or her observations according to a predetermined code. On the other hand, traditional assessment devices have included tests that assess such cognitive styles as impulsivity-reflectivity, independence-dependence, and constricted-flexible control; tests such as the Bender Visual Motor Gestalt Test and human-figure-drawing tests that are used to measure perceptual accuracy, motor coordination, and attentional ability; scales that assess such temperament variables as adaptability, persistence, mood, activity, approach and withdrawal, and threshold of responsiveness; measures of attention; activity level measures such as the activity recorder, the actometer, and the stabilmetric cushion; and intelligence tests that determine the presence of such factors in a child as inattention-memory or distractibility.

Without question, the most heavily researched instrument for assessing ADD involves the use of behavior checklists and rating scales, and the behavior rating scales that appear to be the most widely used assessment instrument are the Conners Parent Questionnaire and the Conners Teacher Rating Scale (revised or unrevised edition). Norms have been established for each instrument, and it appears that the reliability level of these instruments is well within acceptable limits, as each instrument is able to differentiate ADD/hyperactive from "normal" children and is sensitive to treatment effects. On the other hand, enough research has not yet been published on these instruments to allow us to



be certain whether they can successfully differentiate ADD (without hyperactivity) from either "normality" or ADD (with hyperactivity).

Unlike behavioral approaches, which have attempted to link the use of assessment instruments to both diagnosis and treatment, as well as to follow-up, traditional approaches have appeared to rely exclusively on the use of assessment instruments for diagnosis and classification. Nevertheless, both sets of instruments appear to be useful in the conduct of research on various aspects of ADD/hyperactivity.

In terms of future research, what seems to be needed is more systemic study of the predictive validity of the assessment instruments with respect to identifying which types of ADD/hyperactive children are more likely to respond to a particular treatment procedure(s), in which age range, with which type of therapist, and in which type of setting(s). We realize how difficult it is to conduct this type of research, but research in the area of ADD/hyperactivity has been very active for many years, and we are certain that this type of research will become more popular in the next decade.

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# 13      *Infantile Disorders and Childhood Schizophrenia*

SANDRA L. HARRIS

## INTRODUCTION

The identification and differential diagnosis of severe developmental disorders in infancy and childhood pose a variety of problems for mental health professionals and researchers and have led to controversy in the professional literature. There have been frequent attempts to generate organizational schemes to account for these behaviors, variously known as infantile autism, childhood schizophrenia, infantile psychosis, late-onset psychosis, and so forth. The most recent of these diagnostic systems is contained in the third edition of the *Diagnostic and Statistical Manual* of the American Psychiatric Association (1980). Because the DSM-III is the most widespread diagnostic system in current use in the United States, I will use its categories here (see Table 1).

There has been a striking lack of consistency among researchers and clinicians in their use of diagnostic terminology in the area of severe developmental psychopathology. Authors have used the same terms to describe different children and different terms to describe the same children; as a result, the research literature is often confusing and contradictory. Although I have tried to assemble these sometimes inconsistent studies into a reasonably coherent package, it is important from the beginning to warn the reader that there are substantial gaps in the current state of our knowledge.

The best way to start understanding the complexity of the diagnostic process may be to look briefly at the case histories of three children who exhibit different, but overlapping, symptoms of severe developmental psychopathology.

## INFANTILE AUTISM

Lois Watson was 4½ years old the first time we saw her. She came to us because the teacher in her preschool program recognized that Lois's needs were

TABLE 1. Symptoms of Severe Developmental Psychopathology

*Infantile autism*

1. Onset before 30 months.
2. Pervasive lack of response to other people.
3. Gross deficits in language.
4. Speech, if present, marked by peculiarities.
5. Bizarre responses to environment, such as resistance to change.
6. Absence of thought disorder.

*Childhood-onset pervasive developmental disorder*

1. Onset after 30 months, but before 12 years.
2. Gross and sustained impairments in relationships.
3. At least three of the following: sudden excessive anxiety, constricted or inappropriate affect, resistance to change, oddities of motor movement, abnormalities of speech, hyper- or hyposensitivity to sensory stimuli, and self-mutilation.
4. Absence of thought disorder.

*Schizophrenia in childhood*

1. At least one of the following: bizarre, somatic, grandiose, or persecutory delusions; auditory hallucinations; incoherence; loosening of association; illogical thinking; or impoverished speech.
2. Deterioration from a previously higher level of functioning.
3. Symptoms of at least six months' duration.

*Note.* Adapted from the *Diagnostic and Statistical Manual of Mental Disorders (DSM-III)* (American Psychiatric Association, 1980).

not being met in a class for children with mild to moderate developmental difficulties. Even in the midst of her handicapped peers, Lois stood out. Perhaps the most prominent feature of her disability was Lois's infrequent speech. Mr. and Mrs. Watson reported that Lois had been acquiring some speech up to about 18 months of age, when her 20 or so words and simple phrases first fell into disuse and then dropped out of her repertoire. When evaluated, Lois verbalized occasionally and sometimes echoed songs and commercials heard on television.

Lois's parents commented that, although she had been an easy baby to care for, Lois had not sought social contact. From infancy, she had been content to remain alone in her crib for prolonged periods, examining her hands or staring at the bars of sunlight cast on the wall by the venetian blind. As she grew older, she would wander off to her room and sit alone, stacking her blocks endlessly. If her parents or her older brother came to the room and tried to join her play, Lois would stiffen and cry out, protesting until they left. If anyone rearranged the neatly laid pattern of blocks, Lois would not be content until they were restored to their previous positions. She also spent endless hours watching her finger movements as she flicked her hands in front of her face. Lois was a dexterous youngster who sat, crawled, and walked well within normal limits. She could climb with remarkable skill and, having no sense of danger, once climbed out of her bedroom window and onto the porch roof below with speed and agility.

Interviews with Lois's parents, administration of the Bayley (1969) Scales of Infant Development, and observations in school and at home all served to confirm the diagnostic picture of infantile autism in DSM-III. These criteria include (1) onset of symptoms before 30 months of age; (2) a pervasive lack of responsiveness to other people; (3) gross deficits in the development of language; (4) in

those cases where speech is present, peculiarities such as echolalia and reversal of pronouns; and (5) bizarre responses to the environment, such as resistance to change or fascination with animate or inanimate objects. These features are found in the absence of a potential thought disorder such as hallucinations or delusions.

It should be noted that the National Society for Autistic Children (NSAC; 1978) has written an alternative definition similar to that in the DSM-III. As Schopler and Sloan (1983) pointed out, the NSAC definition, which is somewhat broader in scope than the DSM-III definition, not only attempts to clarify diagnosis but also advances sociopolitical strategies to improve the resources available to autistic children. The importance of such goals should not be minimized, although meeting them and enhancing the precision of diagnosis in research may not always be fully compatible.

### CHILDHOOD ONSET OF PERVASIVE DEVELOPMENTAL DISORDER

The product of a full-term pregnancy, Dickie Matthews had posed no special problems to his parents when he was a baby. His mother recalled her pregnancy as normal except for a bout of flu in the fourth month that lasted a full week and left her feeling weak for several additional weeks. Dickie appeared normal at birth, ate and slept well, and, except for some colic at 2 and 3 months of age, developed well. He said his first words at around 13 months of age, and all of his motor milestones were within normal limits. Dickie seemed to be developing into a normal, healthy preschooler until a few months after his third birthday, when his parents began to note that his emotional responses were growing increasingly labile. Subtle changes at first, they quickly grew in intensity, and Dickie began to react to common events with apparent panic.

As he approached his fifth birthday, Dickie's parents could see that his behavior was clearly deviant. He had developed a number of rigid behavior patterns, such as insisting that all of the furniture in his room be lined up in a precise pattern, that the chairs around the kitchen table be placed equidistant from the table, that he drink only from a plastic cup he had once got from his favorite fast-food chain, and that the toy trucks in his room be placed in the same positions daily. His speech, although grammatically complete, was odd and stilted in voice quality. Perhaps most distressing to his parents was Dickie's increasing engagement in more severe head-banging over six months.

The evaluation of Dickie was made difficult by the terror he seemed to experience when brought to the clinic. Even with his parents in the testing room, he did little but cower in the corner, sobbing for the first 40 minutes of the examination. Interviews with his parents and teacher and observations of Dickie at home were more effective in developing a diagnostic picture. Formal testing became possible only several months later, when he had been enrolled in a good school program and had learned to tolerate novel events with more patience.

Although Dickie's behaviors in some way resembled those of Lois Watson, he was more appropriately diagnosed as Childhood Onset Pervasive Develop-

mental Disorder according to the DSM-III. A key feature distinguishing infantile autism and childhood-onset pervasive developmental disorder (COPDD) is that autism begins before 30 months of age, whereas COPDD shows onset after 30 months, but before 12 years. Like the autistic child, the COPDD child shows no evidence of hallucinations, delusions, or other indicators of thought disorder. DSM-III points to two other important criteria in the diagnosis of COPDD: (1) gross and sustained impairments in the child's relationships with other people and (2) at least three of the following seven behaviors: sudden excessive anxiety, constricted or inappropriate affect, resistance to change in the environment, oddities of motor movement, abnormalities of speech, hyper- or hyposensitivity to sensory stimuli, and self-mutiliation.

It is not always easy to make the distinction between COPDD and infantile autism. Even careful questioning concerning the onset of symptoms may not clarify the diagnostic picture. Some parents, after reading about the symptoms of autism, may tend to project these behaviors into their child's early months, whereas others may have overlooked relatively gross deviations in their child because of ignorance about child development or wishful avoidance of the tragic facts of their child's behavior. As a consequence, although the distinction between COPDD and autism may sound clear, it is, in fact, a difficult discrimination.

To complicate the diagnostic process, there has been relatively little research to date on COPDD; as a result, the data base for discriminating this disorder from others is quite modest.

## SCHIZOPHRENIA IN CHILDHOOD

Lorraine Bell was never an easy child, but neither was she grossly different from her peers. Lorraine could best be described as a difficult, fussy baby who required a lot of attention from her parents and who often seemed to be cranky and out of sorts. Nevertheless, she developed normally in most developmental milestones, such as walking and talking. She was a shy little girl who kept to herself and seemed ill at ease with her peers. Nonetheless, she entered kindergarten with no major problems except for a tendency to be a loner. Toward the end of kindergarten and early in the first grade, the adults around her grew increasingly concerned about Lorraine. Her withdrawal intensified, and she spent long periods of time off in a corner, humming to herself and making odd gestures and facial grimaces.

By the time she was in sixth grade, Lorraine's peculiar behavior was increasingly psychotic. A careful psychiatric examination at this time suggested that she might have the rudimentary beginning of a delusional system concerning some of the other children in class and that she experienced auditory hallucinations with some frequency. Lorraine was unable to keep up academically with the other children and was placed in a special classroom for emotionally disturbed children. Given a trial with an antipsychotic medication, she showed

some improvement, but overall, she continued to be peculiar and sometimes clearly psychotic.

The DSM-III indicates that, when a child shows the characteristics of schizophrenia, she or he should be so categorized. There is no separate diagnostic category of childhood schizophrenia. In order to be called schizophrenic, the child must have exhibited a deterioration from a previously higher level of functioning, and symptoms must have lasted at least six months. The symptoms must include at least one of the following: (1) bizarre, somatic, grandiose, or persecutory delusions; (2) auditory hallucinations; or (3) incoherence, loosening of associations, illogical thinking, or impoverished speech. Stutte and Dauner (1971) noted that tightly organized delusional systems are rare in children.

The requirement for a deterioration from a higher level of functioning may pose a special problem when diagnosing schizophrenia in children. Cantor, Evans, Pearce, and Pezzot-Pearce (1982) suggested that some children may meet all of the DSM-III criteria for schizophrenia, except that the onset of their symptoms was so early that they failed to show the required deterioration from a higher level of functioning. As these children exhibit thought disorder, however, they do not meet the requirements for autism. This means that some children cannot be accommodated in the DSM-III.

## FIRST INDICATORS AND PRELIMINARY SCREENING

It is important to note that pervasive developmental disorders and schizophrenia in childhood are rare disorders occurring in 2–4 children per 10,000 (American Psychiatric Association, 1980). Gillberg (1984) reported figures in close accord with DSM-III, estimating 2 children of 10,000 in a Swedish survey of infantile autism. Eggers (1978) estimated the frequency of childhood schizophrenia to be .5%–1.0%. Although other authors may give different figures for the frequency of these disorders, there is no disagreement that they are uncommon. Hence, the average clinician may encounter these problems only rarely. This rarity poses problems of identification because lack of experience diminishes one's knowledge and confidence when making a diagnostic decision.

Fortunately for the diagnostic process, deviations in pervasive developmental disorders and schizophrenia in childhood are so gross that these children are rarely overlooked. In this respect, the disorders differ from some other conditions discussed in this book, where symptoms are subtler and the child may appear normal to the naive eye. The diagnostic challenge in severe developmental psychopathology is one of distinguishing these disorders from one another and from other conditions bearing some resemblance. Thus, it is unlikely that these children will be wholly neglected, although they may be mismanaged.

### *Infantile Autism*

Although the majority of autistic children do not pose major management problems or exhibit severe symptoms of psychopathology during their first year

of life (DeMyer, 1979), close study suggests that many, if not all, of these children exhibit deviance from birth, or soon thereafter. Several studies (e.g., DeMyer, 1979; Finegan & Quarrington, 1979; Gillberg & Gillberg, 1983) have reported that autistic children suffer more pre-, peri-, and neonatal problems than controls.

Harper and Williams (1975) compared autistic children whose symptoms had appeared at birth with those for whom the onset of conspicuous symptoms was sometime before 3 years of age. They found that the later-onset group had a better prognosis in intellectual functioning and language. The children with significant symptoms from birth had a higher frequency of neurological impairment and more prenatal problems than the later-onset group.

The early indicators of infantile autism were studied extensively by Marian DeMyer (1979). According to her research, 88% of parents reported little or no concern about their autistic infant during the first year. This changed markedly in the second year and beyond, as the child's behavior grew increasingly deviant. Indeed, parents tended to describe their child's behavior between 2 and 4 years of age as more deviant than at any other time. DeMyer (1979) indicated that the onset of initial symptoms was insidious and occurred from late in the first year through the second. These symptoms tended to grow worse and then to improve at about age 4.

According to DeMyer (1979), parents of autistic children describe their child's speech development as one of the early and enduring symptoms of the disorder. About half the autistic children in her sample babbled less or with a different tonal quality than their siblings; speech, if it occurred, was delayed and, in some cases, was not meaningful; and there were abnormalities of tone, frequency, diction, or rate in nearly all the children.

The autistic babies in DeMyer's study (1979) did not differ dramatically from normal babies in feeding problems during the first year, but as they grew older, they had more problems, such as food intolerance and food "allergies." They were also slower to feed themselves and to participate in the social aspects of eating. Autistic children had more problems than control subjects in the realms of toilet training, sleep patterns, social behavior, affective expression, and response to parental discipline.

In a close look at the occurrence of autistic symptoms in the first and second years of life, Ornitz, Guthrie, and Farley (1977) assessed 74 young autistic children, comparing them to 38 age-matched control subjects. They found that speech development was significantly delayed from as early as 2 months of age, and motor development by 6 months; likewise, comprehension and communication were markedly delayed during the first two years. On the other hand, perception showed only minor tendencies toward delay.

According to Ornitz *et al.*, (1977), 24–30 months typically elapsed between the time when a parent first felt concern about his or her child and the time when the diagnosis of autism was made. Thus, half the parents were concerned by the time the child was 14 months old, but the median age for diagnosis of autism was 46 months. Many of the children were regarded as mentally retarded

or neurologically impaired before being diagnosed as autistic. These findings point to the importance of early consideration of a diagnosis of autism.

### *Childhood-Onset Pervasive Developmental Disorder*

Char and Lubetsky (1979) raise the question of whether childhood psychosis first appearing in children aged 3–5 is as rare as is typically believed (Kolvin, 1972). They examined six cases seen over a two-year period in one mental health center. As a group, these psychotic children appeared to have been the product of normal pregnancies and had developed normally to age 3. At the time of assessment, they exhibited psychotic behavior and had idiosyncratic language.

In a comparison of early- and late-onset psychotic children, Prior, Perry, and Gjzago (1975) concluded that the early-onset children can be distinguished by a number of features, including abnormal behavior in early infancy, stereotypical behavior, lack of response to other people, withdrawal from sensory stimulation, and abnormal use of speech. Children with infantile autism may be further differentiated from those with other early-onset conditions and from the late-onset children by those behaviors aimed at preservation of sameness in the environment.

### *Schizophrenia in Childhood*

Eggers (1978) noted that children who exhibit symptoms of childhood schizophrenia before 10 years of age tend to develop in an unobtrusive fashion until the onset of the psychosis. She found that the earliest age at which her patients reported hallucinations and delusions was 7, although this was rare. Delusional symptoms, when present, tended to take the form of irrational diffuse fears or cosmic threats (e.g., the sun would fall from the sky).

According to Eggers's research (1978), children who develop schizophrenic symptoms between 10 and 14 years of age show more persistent delusions than the younger children, commonly with religious and depressive themes. Auditory hallucinations are the most frequent form of hallucination for the prepubertal child, but visual hallucinations were found in about half the children she studied. Children with onset of symptoms before 10 years of age tended to develop hallucinations and delusions as they grew older.

## IN-DEPTH ASSESSMENT

The assessment of infantile autism, childhood-onset pervasive developmental disorder, and schizophrenia in childhood has proved a challenge to many examiners. Indeed, for a substantial period of time, autistic children were regarded as essentially untestable. Nonetheless, a variety of standardized instruments have now been developed for the diagnosis of these conditions, and some



traditional tests have been found to be amenable to use with this population as well.

It should be emphasized that obtaining meaningful test results with these children requires time, experience, and a flexibility of approach unrivaled in other areas of child assessment. The examiner should be warned that he or she will, from time to time, be bitten, kicked, and spat on, and that the test materials will surely be tossed about with casual disregard unless the examiner approaches the testing with a firm, alert, and gentle touch. These cautions aside, it is a joy to watch an experienced tester elicit important diagnostic information from a child whom others have dismissed as untestable.

### *Interviews*

It is difficult to imagine a diagnostic assessment of these children that does not include interviews with parents or other caretakers. One should not underestimate the value of the interview in eliciting clinically useful information. When Schopler and Reichler (1972) asked 42 fathers and 45 mothers of psychotic children to estimate their child's level of functioning in overall development, language skills, motor skills, social skills, self-sufficiency, and mental development and compared these estimates with those obtained by psychological testing, they found the parents to be very good judges of their child's functioning. Such a finding suggests that, when it is difficult to obtain a detailed psychological assessment battery, parental judgments offer an alternative source of data, at least for a preliminary assessment.

Obtaining information about the mother's pregnancy, the baby's early health, the age of onset of the symptoms, and developmental milestones may be essential to the diagnostic process. Schopler and Sloane (1983) suggested that this information is helpful in determining whether the baby was atypical from birth or began to deviate sometime after the first year of life. As we noted above, it takes considerable skill to ensure the accuracy of this information, however, as the passage of time and understandable parental distress may well intrude on the memory process.

### *Checklists*

In a recent review, Parks (1983) examined the research evaluating five checklists used to assess autism. These five are Rimland's Diagnostic Checklist for Behavior-Disturbed Children (Rimland, 1964, 1968, 1971), the Behavior Rating Instrument for Autistic and Atypical Children (Ruttenberg, Dratman, Fraknoi, & Wenar, 1966; Ruttenberg, Kalish, Wenar, & Wolf, 1977), the Behavior Observation Scale for Autism (Freeman, Ritvo, Guthrie, Schroth, & Ball, 1978), the Childhood Autism Rating Scale (Schopler, Reichler, DeVellis, & Daly, 1980), and the Autism Behavior Checklist (Krug, Arick, & Almond, 1980).

Only one of these scales, the Diagnostic Checklist for Behavior-Disturbed Children (Rimland, 1971) was designed specifically to be completed by parents; the others are typically completed by professionals based on the child's behavior. All of the checklists except Rimland's Diagnostic Checklist have been sub-

jected to tests of interater reliability and have been found adequate (Parks, 1983).

In terms of discriminant validity, each of the scales offers some support of its ability to discriminate autistic children from other groups, although none has been found fully satisfactory in this regard (Parks, 1983). Hence, without additional data, one must interpret findings from any of these scales with caution. *It does not appear to be appropriate to base a diagnostic decision solely on the score from one of these checklists.*

### *Cognitive Assessment*

Alpern (1967) refuted the notion that autistic children are untestable with standardized psychometric tests. His research suggests that if one selects tests with items at the infant level, previously "untestable" autistic children will respond consistently. As a result of this finding, a number of studies have examined the cognitive functioning of autistic youngsters.

Although it was once popular to think of autistic children as youngsters of normal intellectual potential whose ability was obscured by their autism, it is now widely agreed that the majority of these youngsters will function in the mentally retarded range for their entire lives (Ornitz & Ritvo, 1976). Indeed, the IQs of autistic children have been found to be relatively stable over time (e.g., Rutter, Greenfeld, & Lockyer, 1967). Not surprisingly, IQ is a good predictor of long-term outcome, and IQs of 50 or lower typically predict a poor prognosis (e.g., Lotter, 1978; Rutter *et al.*, 1967). Lower IQs are also associated with more severe autistic symptoms (Schopler *et al.*, 1980).

### *Suggested Instruments*

Schopler and Sloan (1983) discussed the tests used for the assessment of autistic children in the Treatment and Education of Autistic and Related Communication-handicapped Children (TEACCH) program in North Carolina. Among the intelligence tests they found useful were the Peabody Picture Vocabulary Test (Dunn, 1967), the Bayley Scales of Infant Development (Bayley, 1969), the Merrill-Palmer Scale of Mental Tests (Stutsman, 1947), and the Leiter International Performance Scale (Leiter, 1979). They reported using the WISC-R and Stanford-Binet with higher functioning autistic children.

Ferrari (1980) compared the responses of eight autistic children to the Peabody Picture Vocabulary Test and the McCarthy Scales of Children's Abilities. Although he found significant correlations between the two tests, he also noted that the Peabody yielded significantly lower scores than the McCarthy. Stine (1982) described adapting the Peabody Picture Vocabulary Test to low-functioning autistic children who lacked a pointing response by cutting the plates into individual pictures that could be handed to the examiner.

### *Research Findings*

In one study of changes in IQ over time, autistic children were retested after 2–16 years. Most of these children earned scores in the mentally retarded range

during the initial assessment. The results showed relative stability of scores over the years (DeMyer, Barton, Alpern, Kimberlin, Allen, Yang, & Steele, 1974). Scores were predictive of future performance in school, and higher IQ was related to better school record on follow-up. Verbal IQ was related to conversational speech, and those children who had the most adequate speech also had the highest verbal IQs. Children with the most severe withdrawal behavior tended to have lower IQs than those who were more responsive.

The finding of more severe symptoms among lower IQ children was verified by Bartak and Rutter (1976), who compared the symptoms of autistic children with IQs above and below 70. The two groups were similar in terms of serious impairment of social relationships, deficits in language, and ritualistic or compulsive behavior. In addition, the mentally retarded autistic children exhibited a higher frequency of stereotyped movements and self-injury, somewhat greater likelihood of disruptive behavior in public, and delay in developmental milestones.

There appears to be a pattern of sex differences in the cognitive functioning of autistic children. In a sample of 384 boys and 91 girls, aged 3–8 years, Lord, Schopler, and Revicki (1982) found that the boys had higher nonverbal IQs, higher IQs on the Peabody Picture Vocabulary Test, and higher Vineland social quotients than the girls. The boys exhibited more unusual visual responses and more stereotypical play than the girls. Tsai and Beisler (1983) similarly noted that female autistic children as a group were more severely affected than males, but that, when they were matched for chronological age and receptive language ability, the children were equally impaired in cognitive and perceptual motor skills.

Turning to the performance of schizophrenic children, Walker and Birch (1974) found WISC Performance IQ to be consistently superior to Verbal IQ for all ages levels (10–15 years) among those children with Full Scale IQs of 75 or higher. Children with Full Scale IQs below 75 showed a superiority of verbal to performance items. The pattern of performance by schizophrenic boys with IQs below 80 resembled the pattern of brain-damaged children, whereas those with IQs over 80 resembled emotionally disturbed children more than any other group.

Waterhouse and Fein (1984) conducted a longitudinal assessment of the cognitive skills of autistic and schizophrenic children and concluded that children in both groups showed developmental delay at all ages. Their findings also suggest a decline in cognitive functioning for some children in both groups after puberty. At every age, the schizophrenic children earned higher scores than the autistic children, although both groups showed similar patterns of severe developmental delay.

## DIFFERENTIAL DIAGNOSIS

As the previous discussion suggests, it may not always be easy to discriminate pervasive developmental disorders or schizophrenia in childhood from one

another or from other disorders, such as mental retardation, brain damage, aphasia, or deafness. Indeed, on some occasions, several disabilities may occur with severe developmental psychopathologies of childhood and make an accurate diagnosis difficult. As psychiatric diagnosis within narrow categories is often quite unreliable, some of these diagnostic decisions may become of more academic than practical significance, given our current level of technology.

### *Mental Retardation and Central Nervous System Defects*

#### *Behavior*

Comparison of the behavior of autistic and mentally retarded children has generally yielded some differences between the two groups. Thus, Hermelin and O'Connor (1970) suggested that autistic children are less oriented toward visual stimuli and make less use of visual information in handling perceptual motor tasks than do mentally retarded children. In an assessment of behaviors in mentally retarded and autistic children, Freeman, Ritvo, Tonick, Guthrie, and Schroth (1981), found that the autistic children engaged in more repetitive jumping, hand flapping, finger flicking, repetition of sounds, and similar stereotyped behaviors than did mentally retarded children.

Social withdrawal is not unique to autistic children and may also be found in mentally retarded youngsters (Wing & Gould, 1979). Nonetheless, there may be a difference in the quality of this withdrawal. Ando and Yoshimura (1979) observed that the withdrawal of autistic children showed little change over time or during treatment, whereas mentally retarded children became less withdrawn with the passage of time or with intervention. It is, however, important to repeat that some mentally retarded children do exhibit withdrawal behavior; thus, withdrawal by itself is not sufficient to permit a diagnosis of autism.

#### *Personality*

In a comparison of the personality variables of mentally retarded and autistic children, Wolf, Wenar, and Rutterberg (1972) studied Downs syndrome and autistic children on five dimensions: nature and degree of relationship to an adult as a person, communication, vocalization and expressive speech, drive for mastery, and psychosexual development. In each case, the severely mentally retarded children scored higher than the autistic children, thus providing support for the notion that mentally retarded children, although cognitively impaired, are better integrated than autistic youngsters.

#### *Language*

Autistic children, as compared to mentally retarded youngsters, often communicate significantly less (e.g., Ando & Yoshimura, 1979). Thus, whereas

young mentally retarded children may have communication skills consistent with their generally impaired level of intellectual functioning, autistic children typically perform at a lower level. Nevertheless, Ando and Yosihmura (1979) found that, as they grow older, many autistic children do show significant gains in speech and receptive language.

The importance of language in the differential diagnosis of autism was also identified by Spreat, Roszkowski, Isett, and Alderfer (1980). They reported that mentally retarded autistic children could be distinguished from psychotic, schizophrenic, or severely emotionally disturbed subjects, all of whom were also mentally retarded, on the basis of the autistic person's low language level.

### *Specific Syndromes*

Some specific forms of mental retardation may be mistaken for autism. For example, Lesch-Nyhan syndrome is a condition created by a genetic defect in the ability to metabolize the chemical purine. It is typically characterized by a severe degree of mental retardation and by neurological defects including cerebral palsy. Self-mutilation is one of the most distinctive and troublesome behaviors exhibited by these youngsters, and it poses major management problems for parents and other caretakers.

The presence of mental retardation and self-injury in Lesch-Nyhan syndrome has sometimes created confusion for clinicians, who may initially mistake a person with Lesch-Nyhan syndrome for an autistic child. Nyhan (1976) pointed out that self-injury in these patients is severe and dramatically destructive. He also reported that they are engaging children who, when restrained from these inappropriate responses, are relaxed and good-humored, appearing to enjoy being with other people. Such social responsiveness does not, of course, characterize the autistic child.

Another unusual form of brain pathology that may be mistaken for childhood schizophrenia is Davidoff-Dyke-Masson syndrome. In a brief case report, White and Rust (1979) described a child whose symptoms included mental retardation, seizures, and violent, disorganized behavior. The boy reported auditory hallucinations, was preoccupied with race cars, exhibited pressured speech, and spoke in a word salad. His remote and recent memory were impaired. A thorough neurological evaluation revealed the gross brain pathology of Davidoff-Dyke-Masson syndrome. Such findings point to the importance of a neurological examination in making a differential diagnosis.

A similar report of misdiagnosis was made by Gillberg (1980) in the case of a 9-year-old girl who was infected with mycoplasma pneumoniae and was subsequently diagnosed as exhibiting schizophreniform psychosis. The psychosis was wrongly attributed to family problems, and only on further study of blood samples was the relationship of her behavior to the infection established. Her symptoms included lethargy, thought blocking, and auditory hallucinations. Within seven months, the schizophreniform symptoms had disappeared, and on a one-year follow-up, she seemed fully normal.

## *Language Disorders*

Language dysfunctions are common among a variety of childhood disorders. Chess and Rosenberg (1974) reported that children with speech disorders were typically brought for evaluation earlier than children with other presenting symptoms. The speech disorders took many forms and were linked to a variety of diagnoses, including cerebral dysfunction, developmental lag, and reactive, thought, and neurotic behavior disorders.

It is typically reported that developmentally aphasic children use gestures to communicate and respond by facial gesture much more than autistic children (Ornitz, 1973; Wing, 1979). Ornitz (1973) suggested that children with developmental aphasia point to desired objects whereas autistic children do not. The autistic child may use an adult's hand as a tool to reach for the object but does not typically point to it. According to Wing (1979), the developmentally aphasic child usually has an inner language that permits such activities as pretend play with toys. Autistic children do not typically exhibit this capacity for symbolic play (Doherty & Rosenfeld, 1984). Further, Cohen, Caparulo, and Shaywitz (1976) noted that developmentally aphasic children have short memory spans and do not exhibit the oddities of tone, inflection, and voice quality found in autistic and schizophrenic children.

In a comparison of autistic and developmentally aphasic children, Bartak, Rutter, and Cox (1977) found little overlap between the groups on behavioral, language, or cognitive functioning. Although any given autistic behavior may occur in some developmentally aphasic children, the constellation of autistic behaviors is not found in these youngsters. Thus, the developmentally aphasic children as a group showed few of the behavioral deficits of the autistic children, including lack of eye contact, resistance to change, and stereotyped behavior. Similarly, when language behavior was compared, the autistic children were clearly distinguished from the developmentally aphasic by such behaviors as undue sensitivity to noise, pronomial reversal (reversal of pronouns), and stereotyped utterances. Based on this report, when one observes autistic behaviors in a child who has been diagnosed as developmentally aphasic, it is essential to reconsider the diagnosis and to evaluate the child closely for possible autism.

## CO-OCCURRING DISORDERS

The challenge of differential diagnosis is made all the more complex because some children can be correctly diagnosed as exhibiting infantile autism, childhood-onset pervasive developmental disorder, or schizophrenia in childhood along with another disorder. Most of the research in this area has focused on the appearance of autistic behavior in conjunction with a variety of known biological disorders. Such co-occurrence argues for the notion that autism may be not a single disorder, but a group of disorders, just as *mental retardation* is a term that refers to a variety of conditions. Although a number of different disorders that

are accompanied by autistic symptoms have been identified, these still account for only a small percentage of autistic children (Coleman, 1976). It is likely that continuing research will identify new subgroups of autism.

### *Chromosomal and Genetic Defects*

Chromosomal defects may be accompanied by autistic behavior. Thus, Hansen, Brask, Nielsen, Rasmussen, and Sillesen (1977) described a severely mentally retarded 14-year-old girl with autistic behavior who had an extra bisatellited marker chromosome. Another known chromosomal defect that may be accompanied on very rare occasions by autistic behavior is Down syndrome (Wakabayashi, 1979). Hersh, Bloom, and Weisskopf (1982) reported the co-occurrence of Coffin Siris syndrome (a disorder involving growth disorder and abnormalities) and infantile autism.

Still another chromosomal defect that has been linked to some cases of infantile autism is fragile-X syndrome. Meryash, Szymanski, and Gerald (1982) described a 6-year-old boy who was diagnosed as exhibiting fragile-X syndrome on the basis of chromosomal studies and who met the DSM-III criteria for autism. Gillberg (1983) reported a case of triplets with infantile autism and fragile-X syndrome.

Neurofibromatosis is a rare syndrome that either may be hereditary or may occur by spontaneous mutation (an uninherited change in the form of a gene). Gilberg and Forsell (1984) reported that this disorder may occur with greater than statistically expected probability among psychotic children.

### *Infectious Disease*

One of the more frequent examples of the co-occurrence of a known disease and autism is found in children with congenital rubella. Chess (1977) studied this phenomenon extensively and observed that some rubella syndrome children did indeed exhibit the classic symptoms of infantile autism. In following this group of children, she noted that, although the number of rubella syndrome children who exhibited autistic symptoms was far greater than the frequency of autism for children in general, many of the rubella syndrome children tended to recover relatively quickly from their autistic symptoms, an observation not typically made about other autistic children.

Another example of the presence of a viral infection in a case of autism was reported by Stubbs (1978), who identified a 17-month-old autistic boy with a case of intrauterine cytomegalovirus infection. The youngster was also mentally retarded, deaf, and cerebral-palsied. A similar report was made a few years later by Markowitz (1983).

### *Physical Trauma*

The physical or infectious trauma that accompanies autistic behavior need not occur during the pre-, peri- or neonatal phase. For example, Weir and

Salisbury (1980) identified a 10-year-old boy who suffered brain damage and thereafter exhibited autistic symptoms, including gaze avoidance, emotional blunting, and sensory inattention. He also lost speech, was restless and negativistic, had poor concentration, and exhibited repetitive mannerisms. There was a gradual fading of the autistic symptoms during his recovery, although severe intellectual impairment remained.

An example of the co-occurrence of autistic behavior and seizure activity was described by Taft and Cohen (1971). They discussed the development of autism in five children with infantile spasms, a type of seizure that may be characterized by "jackknife spasms," in which the body rapidly and repeatedly jerks forward. There is a specific EEG pattern associated with infantile seizures called *hypsarhythmia*. Other developmental disabilities that may be accompanied by infantile spasms are Tay-Sachs disease, phenylketonuria, and Down syndrome (Batshaw & Perret, 1981).

## SUMMARY

I have reviewed the chief diagnostic characteristics of three forms of severe developmental psychopathology: infantile autism, childhood-onset pervasive developmental disorder, and schizophrenia occurring in childhood. The diagnosis and assessment of these disorders pose sophisticated challenges to the clinician or researcher. Much of the diagnostic information is based on potentially biased retrospective report, there is considerable overlap in symptoms among the diagnostic groups, and most clinicians see few of these children in their regular practice.

Although children with autism may not exhibit conspicuous symptoms during their first year of life, they appear to be increasingly deviant in the second year, and their symptoms may peak before their fourth birthday. Children with childhood-onset pervasive developmental disorder show increasingly deviant behavior after 30 months of age, whereas youngsters with schizophrenia are more often identified in later childhood.

The assessment of severe developmental disorders in childhood should always include interviews with the child's caretakers and can be supplemented with commercially available checklists and traditional instruments for cognitive assessment. It is often useful, when testing these children, to use test materials aimed at much younger children because marked cognitive impairment is common, especially among the autistic children. As the course of these disorders, when untreated, is quite stable with little likelihood of remission, it is important to recognize these forms of severe developmental psychopathology as early as possible and to begin appropriate intervention. It is naive to expect these children to "outgrow" their disabilities.

Although diagnosis may be difficult, and we do not yet have all of the necessary data to give us full confidence in our decision-making process, nonetheless it is important to proceed with our best clinical judgment in individual cases. It is also important to press for additional research into these diagnostic



questions and to further refine the assessment process to yield increasingly precise information.

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# 14      *Depression*

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In many ways, the study of depression in children is a relatively recent enterprise. Stirred partly by an NIMH conference on the topic (Schulterbrandt & Raskin, 1977), interest in the clinical and research literature has burgeoned in recent years. One of the reasons for the lack of earlier progress was the multitude of definitional issues and theoretical conflicts that surround the construct of childhood depression. This chapter attempts to outline some of these problems and some of their possible resolutions. Measurement problems follow from the definitional and theoretical issues. A host of new scales have been developed to assess depression as a diagnostic syndrome, or as a dimension of psychopathology. Scales assessing related dimensions also have importance in the overall assessment picture. Instruments of these various types are reviewed here. Treatment studies are only beginning to appear, so that the relationship of specific scales to treatment choice or outcome assessment is somewhat speculative. Some speculations are offered.

## DEFINITIONS OF THE PROBLEM

Historically, several positions have evolved with regard to depression in children. Earlier positions discouraged attempts at measurement and research. Psychoanalytically oriented writers (e.g., Beres, 1966; Rochlin, 1959) argued that childhood depression cannot exist on the theoretical grounds that depression is primarily a superego phenomenon and thus cannot exist in children, in whom the superego has not fully developed. Rie (1966), in a review of the literature, concluded that childhood depression—referred to behavioral manifestations, affects, and inferred dynamics equivalent to those used as criteria for adult depression—cannot exist in children because, theoretically, a stable self-representation does not develop until adolescence. Other psychoanalytically oriented theorists, particularly those who adhere to object relations theory, have criticized classic theory, arguing that, although depression in childhood may not exist in a form identical to that in adulthood, children can experience the sustained affect of sadness and certain symptoms associated with the syndrome of

depression (Blatt, 1974; Blumberg, 1978, 1981; Caplan & Douglas, 1969; Engel, 1962; Sandler & Joffe, 1965; Toussieng, 1975). Sandler and Joffe (1965) argued that it is the loss of a previously satisfying state, not the actual loss of a love object, that can lead to depression. However, the child who fails to give up the ideal state can experience feelings of helplessness and passive resignation, which Sandler and Joffe consider depression. The fixation at a particular stage can take place anywhere in the developmental process, including infancy.

A second general stance has been taken by authors who have proposed that children, in their attempts to ward off depressive feelings, mask their depression by exhibiting various symptoms that appear to be unrelated to depression (Cytryn & McKnew, 1974; Glaser, 1968; Lesse, 1974; Toolan, 1962). Proponents of this view argue that a child's depressive mood is not sustained because the child cannot tolerate prolonged feelings of sadness. Two criteria for determining that a symptom is masking underlying depression have been proposed (Glaser, 1968; Pichot & Hassan, 1973; Toolan, 1974). First, the presenting problem should not be associated with symptoms of depression, and second, there must be concurrent evidence of depressive symptoms indicated by the child's dreams, fantasies, and verbal content. The most frequently cited masking symptoms are psychosomatic illness, phobias, hyperactivity, enuresis, encopresis, disobedience, poor school performance, aggressive behavior, and temper tantrums (Bakwin, 1972; Cytryn & McKnew, 1972; Renshaw, 1974). The concept of masked depression has been severely criticized as being confusing at best (Bemporad, 1978; Carlson & Cantwell, 1980a; Cytryn, McKnew, & Bunney, 1980; Kovacs & Beck, 1977; Puig-Antich, 1982b; Rie, 1966). If the concept of a masking symptom is applied to virtually every pathological behavior of childhood, it then loses meaning. Furthermore, if independent evidence of depression is necessary before identifying a symptom as masking a depression, there is a contradiction in defining depression as "masked" that thus eliminates any heuristic value that the concept may have.

In an empirical study of 7- to 12-year-old outpatient clinic children, Carlson and Cantwell (1980a) concluded that adult criteria can be used to diagnose depression in children in this age group, and that careful assessment procedures can "unmask" depression associated with other problems. Some children who meet criteria for depression also meet criteria for other disorders, but other children meet only criteria for depression. Although dual or multiple diagnoses are common in clinical populations of children, similar conclusions regarding the possibilities of independent criteria have been drawn in the areas of juvenile delinquency (Chiles, Miller, & Cox, 1980), abdominal pain (Hughes, 1984), hyperactivity (Brumback & Weinberg, 1977), and learning disabilities (Brumback & Staton, 1983). Whereas other behavioral problems occur concurrently in some depressed children, careful assessment can lead to diagnoses of both disorders rather than to a conclusion that "masking" symptoms are providing a defense against depression that is neither directly experienced by the child nor diagnosable by the clinician using standard means.

Lefkowitz and Burton (1978) presented a third major position, arguing that what are viewed as symptoms of childhood depression are simply transient

developmental phenomena. They argued that the symptoms of depression are too prevalent in the normal population of children to be considered statistically deviant. Descriptions of more enduring phenomena in the literature are dismissed as "insufficient and insubstantial." They concluded that the diagnosis of childhood depression is premature and that treatment is unwarranted.

Several criticisms can be lodged against the position that a behavior is indicative of maladjustment only when it deviates sufficiently from epidemiological norms (Costello, 1980; Kashani, Husain, Shekim, Hodges, Cytryn, & McKnew, 1981). First, the presence of a single symptom in a particular child may not be indicative of pathology. However, a pattern of symptoms, or symptom clusters, may indicate maladjustment. Second, a number of follow-up studies have suggested that childhood depressive disorders are not as transitory as Lefkowitz and Burton indicated. These studies concluded that depression in children can be persistent and can lead to later depression in adulthood. Also, depression in children is associated with long-term impairment in interpersonal and academic functioning. Finally, several authors have argued that prevalence alone is an inadequate criterion for considering a symptom indicative of depression (Cytryn & McKnew, 1972; Dorpat, 1977; Renshaw, 1974). The impact of a symptom on the child's cognitive and emotional functioning and development must also be taken into account (Birleson, 1980).

A fourth position has developed by consensus of investigators. This position is that depression in children is similar to depression in adults, but that there are some age-appropriate symptoms as well (Cantwell & Carlson, 1979; Kashani, Husain, & Shekim, 1981; Puig-Antich, 1982a). This hypothesis is essentially the approach that has been adopted by the authors of the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III; American Psychiatric Association, 1980). In general, the position holds that the essential features of dysphoric mood or anhedonia of a major depressive episode are similar in infants, children, adolescents, and adults, although the associated features may vary as a function of age. This approach still leaves a great deal of variability, as the clinical descriptions of typical symptoms and downward translations of adult criteria vary considerably (see Table 1 and "Diagnostic Criteria" below).

The argument for a unitary syndrome across the age span derives in large part from a conception of depression as a biological disorder. Three forms of evidence—genetic, biochemical, and physiological—support this view. Evidence of the inheritability of depressive disorder is available from studies of monozygotic and dizygotic twins (Gershon, Bunney, Leckman, Van Eerdewegh, & DeBauche, 1976) and of monozygotic twins reared together and apart (Perris, 1968). The specific mechanism for genetic transmission remains controversial. Two mechanisms have been proposed. In the single-major-locus theory, the gene for the disorder is essentially dominant, the predicted gene frequency is low, and there is low penetrance (Gershon *et al.*, 1976). The multifactorial polygenic theory assumes that multiple genes are associated with the disorder, and that the severity of the disorder is determined by the ratio of dominant to recessive genes inherited (Baron, Mendlewicz, & Klotz, 1981;

TABLE 1. Symptoms of Childhood Depression

Symptom	Study <sup>a</sup>											% of studies citing
	Frommer, 1968	Connell, 1972	Cytyn & McKnew, 1972	McConville et al., 1973	Weinberg et al., 1973	Albert & Beck, 1975	Kovacs, 1977	Pearce, 1977	Pett, 1978 (revised Weinberg criteria)	Pozanski et al., 1979	Carlson & Cantwell, 1979 (DSM-III)	
Dysphoric mood	x	x	x	x	x	x	x	x	x	x	x	100
Suicidal ideation		x	x	x	x	x	x	x	x	x	x	91
Sleep disturbance	x	x	x		x	x	x	x	x	x	x	82
Appetite/weight disturbance		x	x		x	x			x	x	x	73
Self-deprecation/low self-esteem		x	x	x	x	x			x	x	x	73
Diminished socialization		x	x		x	x			x	x	x	67
Somatic complaints	x	x	M		x	x			x	x	x	67
Change in school performance	x	x	M		x	x			x	x	x	67
Agitation/aggression	x	x	M		x	x			x	x	x	67
Irritability	x	x			x	x			x	x		55
Crying	x	x			x	x			x	x		55
Fatigue/decreased energy		x			x	x			x	x		45
Anhedonia					x	x			x	x		36
Hopelessness/helplessness					x	x			x	x		36
Psychomotor retardation				x		x						36
Moodiness					x	x			x			27
Anxiety	x											27
Change in school attitude		x			x				x			27
Enuresis	x	x							x			27
Concentration difficulty												27
Hypochondriasis		x										18
Stealing		x							x			9
Hyperactivity			M									9
Delinquency			M									9
Uncommunicativeness												9

<sup>a</sup> M denotes masking symptom.

Gershon, Hamovitt, Guroff, Dibble, Leckman, Sceery, Targum, Nurnberger, Goldin, & Bunney, 1982). Therefore, though it is clear that some genetic component is involved, the issue of the mode of genetic transmission remains unsettled (Gershon & Nurnberger, 1982). It is clear, however, that depressed children are likely to have depressed mothers (Brumback, Dietz-Schmidt, & Weinberg, 1977; Cytryn & McKnew, 1974; Poznanski & Zrull, 1970) and that depression in parents is a risk factor for children (McKnew, Cytryn, Efron, Gershon, & Bunney, 1979; Welner, Welner, McCrary, & Leonard, 1977). The separation of heredity from environment in these studies is not clear.

Several biochemical markers of adult depression have been explored in children: dexamethasone suppression, MHPG (3-methoxy-4-hydroxyphenylglycol) and growth hormone secretion. One neuroendocrine marker that has been found to be highly specific for major depression in adults is the failure to suppress cortisol production on the dexamethasone suppression test. Failure to suppress on the DST has been reported for children and adolescents in both inpatient and outpatient settings (Extein, Rosenberg, Pottash, & Gold, 1982; Geller, Rogol, & Knitter, 1983; Hsu, Molcan, Cashman, Lee, Lohr, & Hindmarsh, 1983; Livingston, Reis, & Ringdahl, 1984; Poznanski, Carroll, Banegas, Cook, & Grossman, 1982; Robbins, Alessi, Yanchyshyn, & Colfer, 1983; Targum & Capodanno, 1983). Although the test is fairly sensitive in identifying depressed children, it has poor specificity insofar as it also categorizes a number of nondepressed children as depressed. In one study (Livingston *et al.*, 1984), all of the nondepressed-nonsuppressed received a diagnosis of separation anxiety, leading the authors to question its validity as a separate diagnostic category rather than as a depressive equivalent (Targum & Capodanno, 1983; Weller, Weller, Fristad, & Preskorn, 1984).

A second biochemical correlate of adult depression is the excretion of the urinary metabolite 3-methoxy-4-hydroxyphenyl glycol. It is theorized that levels of norepinephrine are decreased in the central nervous systems of depressed adults, the result being lower levels of its major metabolite, MHPG. Consistent with studies of depressed adults, studies of prepubertal children have generally found lower MHPG levels in depressed than in normal children (Cytryn, McKnew, Logue, & Desai, 1974; McKnew & Cytryn, 1979). Other variables, such as age, body weight, and creatinine levels also affect MHPG level (Shekim, Javid, Rutledge, Bylund, & Davis, 1984). Therefore, although MHPG levels appear to be related to depression in children, interpretation of results should take into account other correlated variables.

Finally, in response to insulin-induced hypoglycemia, depressed adults show hyposecretion of growth hormone (GH) (Sachar, Finkelstein, & Hellman, 1971). This response has also been observed in prepubertal children with a diagnosis of endogenous major depression (Puig-Antich, *et al.*, 1984). In sum, several biochemical markers of adult depression have been found in a majority of depressed children. These results indicate that, for a major subset of depressed children, biochemical correlates appear to parallel those found in depressed adults.

Physiological studies of depressed children have focused on EEG patterns



during sleep. In depressed adults, sleep patterns are characterized by shortened REM latency (the period between onset of sleep and the first appearance of REM sleep). Although studies of depressed adolescents have obtained similar results (Lahmeyer, Poznanski, & Bellur, 1983), studies of prepubertal children have not (Puig-Antich, Goetz, *et al.*, 1982; Puig-Antich, *et al.*, 1983). Two hypotheses that have been proposed to account for these discrepant results (Puig-Antich *et al.*, 1982) are (1) that depressive disorders in prepubertal children are qualitatively different from adult depressive disorders, and (2) that maturational factors account for differences in the physiological expression of depression at various ages. Overall, although evidence for a biological similarity between depression in children and adults has stimulated a good deal of interest in the topic, firm conclusions cannot yet be reached.

## DIAGNOSTIC CRITERIA

The use of adult diagnostic criteria for major depressive disorder as outlined in the DSM III is being advocated with increasing frequency (Cantwell & Carlson, 1979; Costello, 1981; Kazdin & Petti, 1982; Puig-Antich, 1982a). Historically, criteria for a diagnosis of depression in children were first specified in 1970 (Ling, Oftedal, & Weinberg, 1970). In this study of children with severe headaches, 66% (10/15) of the subjects met the criteria, based on the presence of four of the following symptoms: significant mood change, social withdrawal, poor school performance, sleep disturbance, aggressive behavior, self-depreciation, lack of energy; somatic complaints, school phobia, or weight loss. Emphasis was placed on recent changes in behavior. The so-called Weinberg criteria (Weinberg, Rutman, Sullivan, Penick, & Dietz, 1973) were a combination of the Ling *et al.* (1970) and Feighner *et al.* (Feighner, Robins, Guze, Woodruff, Winokur, & Munoz, 1972) Research Diagnostic Criteria (RDC) for adults. In the Weinberg *et al.* study of children referred to an educational diagnostic center, symptoms of dysphoric mood and self-depreciatory ideation, as well as two or more of the following eight symptoms, had to be present at least one month for a diagnosis of childhood depression to be made: aggressive behavior, sleep disturbance, change in school performance, diminished socialization, change in attitude toward school, somatic complaints, loss of usual energy, or unusual change in appetite or weight.

Between then and 1980, most studies have used either the Weinberg criteria or the Research Diagnostic Criteria to diagnose childhood depression. Of 69 empirical studies conducted between 1980 and 1984, 50 (72%) used either RDC or DSM-III adult criteria, which are virtually identical. Four studies (6%) used the Weinberg criteria. In a comparative study of the use of the DSM-III versus the Weinberg criteria (Carlson & Cantwell, 1982), 78% of the children who met the DSM-III criteria also met the Weinberg criteria; conversely, 58% of the Weinberg depressed children also met the DSM-III criteria. The authors concluded that the use of the DSM-III criteria is more restrictive, identifying children who are more severely depressed than Weinberg depressed children.

Several problems have been noted regarding the application of adult criteria to children (Garber, Greenberg, & White, 1980; Kazdin & Petti, 1982). First, little is known about the validity or the reliability of these criteria as applied to children. Second, these criteria overlook the unique developmental changes in children's symptoms. Some symptoms are found more often in children, such as somatic complaints and school phobia; conversely, some symptoms are found more often in adults, such as guilt, suicidal ideation, or psychomotor agitation or retardation. Several authors have concluded, however, that these criteria provide a starting point of lowest inference (Puig-Antich, 1982a) by emphasizing similarities across the developmental spectrum. The advantage is that, as a result, a homogeneous diagnostic group can be identified for research purposes. On the other hand, the disadvantage is that this "lower limit" of the DSM-III may be too high for clinical purposes, excluding true depressives from their proper diagnosis, and hence from access to proper treatment (Petti, 1981).

## DEPRESSION INSTRUMENTS

Several approaches have been developed primarily to assess depression in children: interviews, self-report, and peer ratings (see Table 2). Major diagnostic interviews include the Schedule for Affective Disorders and Schizophrenia for School-Aged Children (Kiddie-SADS; Puig-Antich & Chambers, 1978), the Interview Schedule for Children (ISC; Kovacs, Betof, Celebre, Mansheim, Petty, & Raynak, 1977), and the new Diagnostic Interview Schedule for Children (DIS-C). The Bellevue Index of Depression (BID; Petti, 1978), the Children Depression Rating Scale (CDRS; Poznanski, Cook, & Carroll, 1979), and the Children's Affective Rating Scale (CARS; McKnew *et al.*, 1979) yield ratings of the severity of depression.

The major interview currently in use is the Kiddie-SADS (Puig-Antich & Chambers, 1978), adapted from the adult version (Schedule for Affective Disorders and Schizophrenia, SADS; Endicott & Spitzer, 1978). It is designed for use with children aged 6–16 and can be used to obtain RDC or DSM-III diagnoses for major depression as well as for other childhood disorders. The authors recommended that multiple assessment sources, primarily a parent and the target child, be used to improve reliability.

Like the Kiddie-SADS, the Interview Schedule for Children (ISC; Kovacs, 1978) is a structured interview that assesses the presence and severity of symptoms of depression in children aged 8–13. It also assesses symptoms of other disorders, such as conduct disorder and hyperactivity, as well as other so-called masking symptoms.

Currently under development through the sponsorship of the Center for Epidemiologic Studies of the National Institute of Mental Health is the Diagnostic Interview Schedule for Children (DIS-C; Costello, Edelbrock, Kalas, Dulcan, & Klaric, 1984). The DIS-C is patterned after a similar instrument that was developed for use in epidemiological studies of adults, the Diagnostic Interview Schedule (Robins, Helzer, Croughan, & Ratcliff, 1981). The intent of the scale is

TABLE 2. Childhood Depression Instruments

Instrument	Author	Description	Informant	Age range	Adult counterpart
Schedule for Affective Disorders and Schizophrenia for School (Kiddie SADS)	Puig-Antich & Chambers (1978)	Structured interview	Child Parent	6-16	Schedule for Affective Disorders and Schizophrenia
Interview Schedule for Children (ISC)	Kovacs (1978)	Structured interview	Child	8-13	
Bellevue Index of Depression (BID)	Petti (1978)	Semistructured 40-item interview	Child Parent	6-12	
Children's Depression Rating Scale (CDRS)	Poznanski <i>et al.</i> (1979)	Interview rating scale	Clinician	6-12	Hamilton Rating Scale
Children's Affective Rating Scale (CARS)	McKnew <i>et al.</i> (1979)	Interview global rating scale	Clinician	5-15	
Children's Depression Inventory (CDI)	Kovacs & Beck (1977)	Written, 27-item multiple choice	Child	7-17	Beck Depression Inventory
Children's Depression Scale (CDS)	Lang & Tisher (1978)	Written 66-item rating scale	Child Parent	9-16	
Children's Depression Adjective Checklist (C-DACL)	Sokoloff & Lubin (1983)	Written checklist	Child		Depression Adjective Checklist
Self Rating Scale (SRS)	Birleson (1981)	Written 18-item rating scale	Child	7-13	
Peer Nomination Inventory for Depression (PNID)	Lefkowitz & Tesiny (1980)	Written 20-item group-administered nomination inventory	Peers		

to provide an instrument that can be used by carefully trained lay interviewers to obtain information relevant to DSM-III diagnostic categories. The interview itself takes about 45 minutes, and the resulting protocol is scoreable by a computer algorithm for both diagnoses and severity dimensions. At the time this chapter was completed, the instrument was still being tested in clinical trials before final revision and dissemination for general research use.

The Bellevue Index of Depression (BID; Petti, 1978) is a semistructured interview for assessing depression in children aged 6–12. It contains 40 items, each rated for severity and duration. The interview can be administered to the child and/or to the child's parents. The symptoms assessed are based on the Weinberg depression criteria.

The Children's Depression Rating Scale (Poznanski *et al.*, 1979; Poznanski, Cook, Carroll, & Corzo, 1983; Poznanski, Grossman, Buchsbaum, Banegas, Freeman, & Gibbons, 1984) is modeled on the Hamilton Depression Scale for adults (Hamilton, 1960). The scale includes ratings of mood, somatic, subjective, and behavioral symptoms. It has been found to be highly correlated with global clinical ratings in pediatric, inpatient psychiatric, and outpatient psychiatric settings. It is designed to be used with children aged 6–12. Like the BID and the CARS, the CDRS is used to measure the presence and the severity of depression. Unlike the Kiddie-SADS or the ISC, these three instruments do not provide assessment of other disorders to establish a differential diagnosis of depression.

The Children's Affective Rating Scale (McKnew *et al.*, 1979) assesses symptoms of depression in three groups: behavior, verbalization, and fantasy. It is based on global clinician ratings rather than self-report of symptoms by the child. It is intended to be used with children aged 5–15.

Only the Kiddie-SADS, the ISC, and the BID are structured clinical interviews; the CDRS and the CARS are rating scales completed by clinicians following an informal interview of the child. The Kiddie-SADS and the ISC assess other disorders as well as depression, making possible the establishment of a differential diagnosis.

Four self-report measures have been developed to assess depression in children. These include the Children's Depression Inventory (CDI; Kovacs & Beck, 1977), the Children's Depression Scale (CDS; Lang & Tisher, 1978), the Children's Depression Adjective Checklist (C-DACL; Sokoloff & Lubin, 1983), and the Self-Rating Scale (SRS; Birlerson, 1981).

The Children's Depression Inventory has 27 items; each consists of three statements, from which the child chooses one. Each item is scored 0, 1, or 2, and the total score is derived by summing the scores on individual items. The higher the score, the more severe the child's report of his or her depression. The scale is a modification of the Beck Depression Inventory (Beck, 1972), an adult measure of severity of depression. Its designated age range is 7–17. A short form, the S-CDI (Carlson & Cantwell, 1980a) is also available. The CDI has been found to be a relatively stable index of depression over a one-month period (Friedman & Butler, 1979) and has been found to correlate well with clinicians' global ratings (Kovacs *et al.*, 1977).

The Children's Depression Scale (CDS; Lang & Tisher, 1978) consists of 48

depressive and 18 positive statements. The child scores each item from 1 ("very wrong") to 5 ("very right"). A parent's version is also available. The measure consists of six subscales, one for positive statements, and five depression scales of affect, social problems, self-esteem, preoccupation with sickness and death, and guilt. Internal consistency is high, and scores on the CDS differentiated a depressed clinical sample from a normal and nondepressed clinical sample. Its use is intended for children aged 9–16.

The C-DACL (Sokoloff & Lubin, 1983) is an adaptation of the adult Depression Adjective Checklist (Lubin, 1967). In a study of children aged 13–19, internal consistency was quite high. The scores correlated significantly with scores on the Beck Depression Inventory.

The Self-Rating Scale (SRS; Birlleson, 1981) consists of 18 items, scored on 3-point scales. It is intended for use with children aged 7–13. The scale differentiates depressed from nondepressed clinical samples. Internal consistency and test–retest reliabilities are adequate.

Each of these self-report rating scales assesses overall severity of depression. None of them provides a basis for a diagnosis, as they examine overall severity rather than the severity of individual symptoms, and none of them provides information for a differential diagnosis.

One measure, the Peer Nomination Inventory for Depression (PNID; Lefkowitz & Tesiny, 1980), has been developed specifically to assess peer ratings of depression. Each child is asked to nominate a peer in response to 20 depression items. A child's score consists of the total number of nominations received. Internal consistency and test–retest reliabilities have been found to be quite high. In addition, a significant relationship was found between PNID scores and teacher ratings of depression. Its usefulness in a clinical setting may be limited, however, as the measure requires a fairly large group of children who are well known to each other, such as that found in a classroom.

Reliability and validity research with the interviews, self-report scales, and peer rating has thus far been somewhat limited. In addition, these instruments vary on a number of dimensions that limit comparability, including the extent to which there is reliance on the child's self-report, the inclusion of specific symptoms, and the age range with which the instrument can be used. More research is needed to determine the relative usefulness of these instruments for the establishment of a diagnosis of childhood depression, as well as an assessment of its severity.

## INSTRUMENTS INCLUDING DEPRESSION SUBSCALES

Several measures have been developed and are currently in use that include subscales that assess depressive symptomatology in children (see Table 3). These instruments include child interview schedules such as the Diagnostic Interview for Children and Adolescents (DICA; Herjanic, Herjanic, Brown, & Wheatt, 1975) and the Child Assessment Schedule (CAS; Hodges, Kline, Fitch, McKnew, & Cytryn, 1981), as well as parent or teacher checklists such as the

Child Behavior Checklist (CBCL; Achenbach, 1978) and the Personality Inventory for Children (PIC; Wirt, Lachar, Klinedinst, & Seat, 1977).

The Child Behavior Checklist (CBCL; Achenbach, 1978) is a standardized measure designed to obtain parents' reports of their 4- to 16-year-old children's competencies and problems. The instrument includes 118 behavior problem items, each scored on a scale of 0 to 2, as well as 20 social competency items that comprise activities, social, and school scales. There are separate empirically based norms and scoring procedures for each sex and age group. Factor analysis has yielded several behavior problem scales, including depression, as well as somatic complaints, social withdrawal, delinquent, aggressive, and hyperactive. Second-order factor analyses show that these behavior problem scales can be divided into two broadband factors: "internalizing" and "externalizing." Achenbach (1978) and Achenbach and Edelbrock (1978) reported test-retest reliabilities ranging from .82 to .90 and interparent correlations ranging from .54 to .74. The Achenbach Teacher Rating Scale is modeled after the CBCL for parents (Achenbach, 1978). It consists of a 10-item social competency scale and a 103-item behavior problem scale. The teacher's version omits the CBCL items that teachers could not readily judge (i.e., nightmares and bed-wetting) but includes other items such as classroom behavior. As with the CBCL, two broadband factors (internalizing and externalizing) and several narrowband factors, including "depression," have been identified by factor analyses.

The Personality Inventory for Children (PIC; Wirt *et al.*, 1977) is a 600-item instrument designed to assess the behavior of 3- to 16-year-old children via parent report. The instrument uses an MMPI-type format with true-false items. It is composed of 3 validity scales and 12 clinical scales: depression, withdrawal, anxiety, social skills, psychosis, hyperactivity, somatic concerns, delinquency, family relations, development, achievement, and intellectual screening. The depression scale consists of 46 items judged by practicing clinical psychologists to reflect childhood depression as defined by the Group for the Advancement of Psychiatry (1966). The scale was validated on children with primary diagnoses of depression. Further validation data on the PIC were presented by DeHorn, Lachar, and Gdowski (1979) and by Lachar and Gdowski (1979). *T*-score conversion tables are available based on the sex and the age of the child.

The Child Assessment Schedule (CAS; Hodges *et al.*, 1981) is a standardized child interview developed for research and clinical purposes. The instrument, which takes 45–60 minutes to administer, was modeled after the adult psychiatric interview developed by Spitzer, Endicott, Fleiss, and Cohen (1970), with modifications that solicit information about the diagnostic criteria for the major childhood diagnoses according to the DSM-III (American Psychiatric Association, 1980). Thus, the diagnosis of depression is included, along with other childhood diagnoses. In addition, the content area of dysfunction (i.e., school, friends, family, etc.) can be determined from this instrument. The interview consists of two parts: a 75-question section covering several topics, including school, friends, activities, family, mood, and various symptoms, and a 53-item section in which the examiner rates observations and judgments regarding areas such as the child's insight, grooming, motor coordination, activity level, verbal

TABLE 3. Child Assessment Instruments with Depression Subscales

Instrument	Author	Description	Informant	Other scales included	Age range
Child Behavior Checklist (CBCL)	Achenbach (1978)	Written checklist; 118 behavior problem and 20 social competence items	Parents	Schizoid Somatic Aggressive Delinquent Withdrawal Hyperactive (boys and 6- to 11-year-old girls) Immature-hyperactive (12- to 16-year-old girls) Uncommunicative (boys) Obsessive-compulsive (boys) Immature (12- to 16-year-old boys) Cruel (girls) Sex (6- to 11-year-old girls) Anxious-obsessive (12- to 16-year-old girls) Same as CBCL	4-16
Child Behavior Checklist—Teacher Form	Achenbach (1978)	Written checklist; 103 behavior problem and 10 social competence items	Teachers		6-16
Personality Inventory for Children (PIC)	Wirt <i>et al.</i> (1977)	600-item true-false written inventory	Parents	Withdrawal Anxiety	3-16

<p>Social Skills          Psychosis          Hyperactivity          Somatic Concerns          Delinquency          Family Relations          Development          Achievement          Intellectual Screening</p>		
<p>Attention Deficit—with and without hyperactivity          Conduct Disorders—Socialized and Unsocialized, Aggressive and Nonaggressive          Separation Anxiety          Overanxious          Oppositional</p>	<p>Child</p>	<p>Structured interview; 75 questions and 53 clinical observational judgment items</p>
<p>Antisocial Personality          Behavior Disorder          Conduct Disorders          Encopresis          Enuresis          Neurotic Disorder          Mixed Behavior-Neurotic</p>	<p>Child and parent</p>	<p>Structured interview, 201 questions and clinical judgment of mental status</p>
<p>Children's Assessment Schedule (CAS)</p>	<p>Hodges <i>et al.</i> (1981)</p>	<p>6-16</p>
<p>Diagnostic Interview for Children and Adolescents (DICA)</p>	<p>Herjanic <i>et al.</i> (1975)</p>	



communication, emotional expression, interpersonal interaction, and cognitive ability. High interrater reliability (item-by-item percentage agreement) for the total CAS (0.91 and 0.92), as well as for subscales (i.e., 0.92 for depression) has been reported (Hodges, McKnew, Cytryn, Stern, & Kline, 1982).

The Diagnostic Interview for Children and Adolescents (DICA; Herjanic *et al.*, 1975) is a structured psychiatric diagnostic interview with both child and parent forms. The interview takes about 1½ hours to administer and has been used for children between the ages of 6 and 16. The areas assessed include the child's relationships at home, at school, and with peers; school progress; social behavior; somatic symptoms; and a range of psychiatric symptoms from depression and anxiety to psychosis. In addition, the parent form includes questions about early development, parental history, family history, and socioeconomic status. The interview includes nine specific questions that determine the presence of depressive symptoms, including weight loss, crying spells, sleep disturbance, depressed mood, stopped activities, concentration difficulty, and changes in appetite. The DICA has been shown to discriminate between psychiatrically disturbed and nondisturbed children (Herjanic & Campbell, 1977), but discrimination between diagnostic groups within a disturbed population has not yet been demonstrated. Interrater reliability studies have demonstrated overall agreement of 84% and 85% on an item-by-item basis using videotaped interviews, and item-by-item intrarater reliability averaged 89% when raters rescored the same interview after a two- to three-month interval. Test-retest reliability data have not yet been reported.

## ASSESSMENT ISSUES

### *Interinformant Reliability*

In addition to the development of assessment instruments, issues concerning correspondence between various informants have recently received more attention. The traditional practice of accepting the mother's report of her child's psychopathology is now being questioned (e.g. Herjanic *et al.*, 1975; Herjanic & Reich, 1982; Orvaschel, Puig-Antich, Chambers, Tabrizi, & Johnson, 1982). Several groups of researchers have begun to report findings from studies that compare the reports of various informants, usually the mother and the child, concerning the child's psychopathology. However, results and conclusions from these studies have been inconsistent.

Herjanic *et al.* (1975) reported an 80% average agreement rate between child and mother on the same structured psychiatric interview, in a sample of 50 children between the ages of 6 and 16 years. In this study, mother-child agreement tended to be higher for girls than for boys, agreement was highest on questions relating to factual information, and agreement was lowest on questions evaluating mental status.

Reich, Herjanic, Welner, and Gandhi (1982) used a sample of 307 children between 6 and 16 years of age to compare diagnoses made independently from

the responses of children and their mothers to the Diagnostic Interview for Children and Adolescents. Acceptable levels of agreement (using the kappa statistic) were found for the diagnosis of antisocial personality, conduct disorder, enuresis, mixed behavior-neurotic disorder, and possible depressive disorder. Generally, older children (aged 12–16) were in much more agreement with their mothers than younger children, but diagnoses of enuresis and possible depression were reliably made across the entire age range. From the same sample and interview data, Herjanic and Reich (1982) examined agreement between child and mother on specific symptoms. The highest agreement was found on questions concerning symptoms that are concrete, observable, severe, and unambiguous, with mothers reporting more behavioral symptoms and children more subjective symptoms.

Other investigators have examined agreement between mothers and their children using the Kiddie-SADS interview. Orvaschel *et al.* (1982) reported acceptable kappa coefficients (0.6) for most depression items on the Kiddie-SADS, indicating high agreement between mother and child reports to a single rater in this sample of 6- to 11-year-old children. The symptom least reliably reported during assessment of the current episode was guilt, and the symptoms most reliably reported were anhedonia and hypersomnia. The conclusions reached from this study were that prepubertal children can provide important information regarding their behavior, and that errors of underreporting child psychopathology are as likely to be made by mothers as by children.

In contrast with these results, however, Ivens (1984) reported low interinformant agreement using the Kiddie-SADS on a sample of 63 children, mothers, and fathers, including both outpatient clinic and nonclinic children. In this study, one of three independent interviewers administered the Kiddie-SADS to one of the three family members, with no knowledge of the results of the other interviews. Whereas very few investigations of interinformant correspondence have included fathers in the samples, this study was unique in that it examined father–child and father–mother correspondence on reports of each of the child's depressive symptoms, as well as on the overall diagnosis. Generally, on both overall diagnosis of depression and individual depressive symptoms, father–child agreement was lowest and father–mother agreement was highest. However, several exceptions to these low correspondence levels were notable, including high father–mother agreement on the symptom of suicidal thought and moderate agreement among all informants on reports of concentration problems. The trend was for the mothers to report more depressive symptoms in their children than did the fathers or the children, with the exception of children's reporting more fatigue, sleep disturbance, and suicidal ideation than the parents.

These results are similar to those reported by Schultz (1981). In her sample of sixty 8- to 12-year-old outpatient clinic children and their mothers, mother–child correspondence on the Bellevue Index for Depression was in the low to moderate range for all depressive symptoms.

Similarly, Kazdin, French, Unis, and Esveldt-Dawson (1983b) found little or no correspondence between parent and child reports of the children's depres-

sion, on any of several different measures used. They administered the Children's Depression Inventory, the Bellevue Index of Depression, and a Depression Symptom Checklist (which included DSM-III symptoms) to 104 children between the ages of 5 and 13 who were hospitalized on a psychiatric intensive care service, and to one or both parents of each child. The different childhood depression measures completed by the same rater (child, mother, or father) were highly intercorrelated, but there was little or no relationship between raters. These authors concluded that children may underestimate the severity of their symptoms.

In any attempt to make some sense of the apparently contradictory results discussed above, several factors need to be considered. The most obvious differences between the studies discussed are the particular assessment devices used, as well as other methodological differences, such as the populations and the independence of interviewers. In addition, several important issues must be examined if one is to understand discrepancies in the reports of various informants. As several authors have pointed out (e.g., Herjanic & Reich, 1982; Ivens, 1984; Kazdin, 1981), the question of the reporting parent's psychopathology is often ignored, but it may be a factor in the discrepancies. However, this hypothesis has not been adequately investigated. Finally, the question of what specific symptoms are sources of discrepancies has only recently been addressed in a few studies.

### *Validity Issues and Interinstrument Reliability*

Although several measures are now available to measure the severity of depression in children, some with promising data concerning test-retest and interrater reliability, very little convergent or discriminant validation has been reported. A few investigators have reported data on convergent validity of various childhood depression instruments, obtained by examining correlations between scores on different instruments. Kazdin, French, *et al.* (1983) reported that different measures completed by the same informant (child or parent) tended to correlate positively in the moderate to high range ( $r = .32-.81$  for child reports;  $r = .61-.81$  for parents). This study of inpatient children used the Children's Depression Inventory, the Bellevue Index for Depression, and a DSM-III-derived depression symptom checklist, thus introducing the multimethod feature by including both written and interview instruments. Schultz (1981) reported similar results in an outpatient child-guidance-center population with moderate correlation ( $r = .65$ ) between child CDI and BID scores. Both these studies also reported significant differences in scores obtained on each of these instruments between depressed and nondepressed groups identified by DSM-III criteria, findings consistent with other research showing that children diagnosed as depressed score higher than nondepressed children in the CDI, the BID, the Children's Affective Rating Scale, and the Children's Depression Scale (Carlson & Cantwell, 1979; Kashani, Barbero, & Bolander, 1981; Lang & Tisher, 1978; McKnew *et al.*, 1979).

Kaslow (1983) reported similar results from examining CDI self-reports and

composite diagnostic data from Kiddie-SADS interviews with children and both parents. This study included both nonclinic and child-guidance-center children. Correlations among these measures were moderate ( $r = .64$  for the combined sample;  $r = .69$  for the clinic sample alone). Ivens and Rehm (1985) examined additional data from this sample and reported on the item-by-item correspondence between the child's report on the CDI and on the Kiddie-SADS. They demonstrated a moderate level of correspondence (using kappa coefficients) on about half the depressive symptoms assessed in the clinic sample (including dysphoria, appetite disturbance, decreased energy, and poor concentration), low level of correspondence on the other items in the clinic sample, and, in the nonclinic sample, low correspondence on all items except poor self-image. This study is an initial step toward determining which specific items do and do not add to the convergent validity of the existing childhood depression instruments. Much further work is needed to provide ample data concerning convergent validity.

The issue of discriminant validity has been addressed even less in the childhood depression assessment literature, leaving open the question of whether children who obtain high scores on depression instruments are exhibiting depression specifically or psychopathology generally. This question, at a conceptual level, involved the issue of primary versus secondary diagnosis. In terms of the instruments described in this chapter, discriminant validity has not yet been sufficiently demonstrated. Two studies have addressed this issue. Lefkowitz and Tesiny (1980) measured peer nominations (PNID), self-report (CDI), teacher ratings, and academic data and found that PNID scores correlated with teacher depression ratings but did not correlate as highly with CDI scores. Academic achievement and peer popularity correlated more highly with CDI scores. Kazdin, Esveltd-Dawson, Unis, and Rancurello (1983) assessed depression (using the CDI, the BID, and parent and child reports) and aggression in children and reported that, within each informant group, depression measures correlated with each other more, but only slightly more, than with aggression measures. In sum, these investigations leave the question of discriminant validity of childhood depression measures unanswered.

### *Developmental Stage and Depressive Symptoms*

In adult depression, it is assumed that the symptoms associated with depression, although they may vary with the "type" of depression present, are fairly constant across the adult age span. Although this assumption may be questioned, as it has been concerning depression among geriatric populations (Barlow, 1983), it is even more tenuous when applied to children. Because children undergo rapid qualitative and quantitative changes in cognitive development, it can reasonably be expected that the symptoms of depression in children will vary with age. Although there has been very little empirical research that examines the relationship between developmental stage and depressive symptoms, there has been some theoretical literature (Anthony, 1976; Bemporad, 1978; Philips, 1979) and considerable clinical literature (Blumberg,

1978; Frommer, 1968; Malmquist, 1971; McConville, Boag, & Purohit, 1973; Toolan, 1962).

In infancy, the child is egocentric, aware only of her or his own needs. When these needs are unmet, the child may experience overwhelming helplessness. The achievement of object permanence enables the child to recognize the mother's absence, and to subsequently experience abandonment. Depression in infancy, or anaclitic depression, is associated with excessive crying, poor appetite, delayed smile, and failure to thrive (Engel & Reichsman, 1956; Spitz & Wolf, 1946).

Preschool children are usually in the cognitive stage of preoperational thought (Piaget, 1963). In this stage, abilities to self-reflect and to verbalize are limited. Thus, depression may be felt but may not be verbally expressed. Children in this stage usually present with somatic and behavioral symptoms, such as enuresis, sleep disturbance, withdrawal, inhibited play, and crying (Blumberg, 1978; Graham, 1974; Nissen, 1973).

Latency-aged children are usually in the cognitive stage of concrete operational thought. In this stage, children begin to develop concepts of reciprocity and to focus on the judgments of their peers rather than of their parents. Children also begin to internalize more standards. In addition, children are now better able to verbalize and to categorize feelings. Depressive symptoms include low self-esteem, guilt, helplessness, concentration and school difficulties, sleep and appetite disturbance, and sadness (Malmquist, 1975; McConville *et al.*, 1973; Philips, 1979). Behavioral symptoms include school phobia, truancy, temper tantrums, and disobedience (Graham, 1974; Krakowski, 1970; Toolan, 1962).

Adolescents are usually in the cognitive stage of formal operational thought. Because of their more fully developed cognitive abilities to hypothesize about possible alternatives and to conceive of an extended future, they can experience symptoms of anhedonia, loneliness, hopelessness, and suicidal ideation (Garfinkel & Golombek, 1974; Koocher, O'Malley, Foster, & Gogan, 1976).

These clinical studies support the contention that symptoms of depression change with development. In one empirical study (Leventon, 1982), these clinical impressions were partly supported. Younger depressed children were more likely than older children to report acting-out symptoms and the use of external standards in evaluating their misbehavior. Older depressed children more directly expressed sad affect, felt hopeless about the future, and experienced more family difficulties. This area is one that requires more empirical investigation (cf. Cicchetti & Schneider-Rosen, 1984).

### *Sex Differences*

A consistent finding in the adult depression literature has been that depression is more common in women than in men, with ratios estimated to be between 1.5:1 and 3:1 (Radloff & Rae, 1979; Weissman & Klerman, 1977). In the childhood depression literature, the findings have been inconsistent. Reports range from a female-to-male ratio of 2:1 to a male-to-female ratio of 3:1 (Brumback *et al.* 1977; Frommer, 1968; Poznanski & Zrull, 1970). In a sample of non-

clinical children in first, fourth, and eighth grades, no ratio difference was found, and there were very few differences in symptomatology (Leventon, 1982).

Several hypotheses can be considered to account for the difference in sex ratios between adults and children: the artifact hypothesis, the biochemical hypothesis, and the psychosocial hypothesis (Weissman & Klerman, 1977).

The artifact hypothesis suggests that the differences in ratios can be accounted for by the nature of the populations of children seen in different settings. Thus, in an educational diagnostic center, where the sample contained more boys initially, the ratio of depressed males to depressed females was large (Brumback *et al.*, 1977). In a hospital treatment setting, more depressed females were found (Frommer, 1968).

The biochemical hypothesis suggests that hormonal changes associated with puberty contribute to mood changes. These hormonal changes may lead to greater vulnerability for depression in women after adolescence. In a study that examined depression in early adolescence (Albert & Beck, 1975), mean scores on the Beck Depression Inventory (BDI) increased between seventh and eighth grades, with most of the increase accounted for by girls. This finding suggests that a shift toward the male-to-female ratio found in adult depression may begin to take place in early adolescence, perhaps because of biochemical changes.

The psychosocial hypothesis suggests that sociological factors have historically deprived women of desirable roles. As a result of the socialization of women into traditional roles, they may be more likely to experience inadequacy, low self-esteem, and depression. In preadolescence, incomplete socialization regarding career, marital, and parental roles may contribute to a lack of sex differences for depression. This hypothesis suggests that the male-to-female ratio for depression in adults may change as the roles of women in society continue to change.

Thus, unlike in the findings for adults, the findings for the incidence of depression in male and female children are inconsistent, and in one study (Leventon, 1982), no difference was found. Research on older children (Albert & Beck, 1975) suggests that an increase in the incidence of depression in females begins to occur in early adolescence, resulting in a male-to-female ratio more similar to that seen in adults.

### *Primary versus Secondary Diagnosis of Depression*

An issue of some controversy is whether it is possible to distinguish primary or secondary depression in children. As discussed earlier, one concept of depression is that it is primary but is "masked" by the presence of other disorders, such as conduct disorder, hyperactivity, learning disabilities, or school phobia (Cytryn & McKnew, 1972; Glaser, 1968; Toolan, 1974). Presumably, young children are unable to tolerate sad affect and defend against sad feelings via these other disorders. Other studies have suggested that depression develops in response to other disorders, such as learning disabilities or cancer (Kashani & Hakami, 1982). This controversy involves the issues of both assessment and

treatment. Several authors have argued that, with careful assessment, all disorders present can be adequately diagnosed (Cytryn *et al.*, 1980). In one study, a diagnosis of childhood depression and no other psychiatric disorder was rare (Kaslow, 1983). Most studies have had similar results: depression has been frequently diagnosed along with separation anxiety, learning disabilities, hyperactivity, school phobia, or conduct disorders.

Given these findings, the question is raised whether to treat the depression, the other concurrent disorder, or both, and if both are treated, then in what order. As children with multiple diagnoses appear to be the rule rather than the exception, efforts to treat only one disorder, be it depression or another disorder, will probably prove to be inadequate. Furthermore, the determination of the "primary" disorder—and then treatment of that disorder on the assumption that the "secondary" disorder will be eliminated—would be difficult at best and arbitrary at worst. One clinical case study (Petti, Bornstein, Delamater, & Conners, 1980) described a multimodal approach including individual psychotherapy, milieu therapy, antidepressant medication, behavior therapy, and family therapy, each targeted to the treatment of specific symptoms in a child with depression, school refusal, and conduct disorder. Treatment approaches such as this one, which assess the presence and severity of individual symptoms across disorders and then treat each symptom with the most effective treatment available, may ultimately prove more efficacious than efforts to establish a diagnosis as primary or secondary.

## THERAPY ASSESSMENT

The instruments reviewed above view depression as a global syndrome with a variety of affective, cognitive, somatic, and behavioral symptoms. Alleviation of the full syndrome is the goal of any intervention for depression, and any of the measures described above might be useful as an outcome measure. For example, studies evaluating the effectiveness of various antidepressant medications on depression in children may use interview and self-report measures to evaluate the outcome of the medication trials. In contrast, current social-cognitive perspectives on depression view the syndrome as resulting from certain key deficits. Remediation of the syndrome is then based on remediation of the key deficit. Thus, for social-cognitive interventions, assessment of the syndrome might not be sufficient. It would also be necessary to assess the key deficit or deficits. A number of existing instruments would be useful for this purpose.

Although relatively little work has been reported in the intervention literature on therapy for depression in children, an outline of the possibilities for such interventions can be constructed by analogy with the adult depression-therapy literature. Five forms of treatment can be identified in the adult treatment literature: (1) activity increase programs; (2) social-skill-training programs; (3) cognitive-behavioral programs; (4) attributional style programs; and (5) self-management programs. These programs have been fairly well-established in the

adult literature as effective methods for treating depression. In each instance, there are a few examples of similar treatments being applied with children.

There is much potential for further development. Certain instruments already developed for application with children could be useful for assessing the applicability of the treatment and the success of the outcome in modifying the targeted deficit. Each strategy is reviewed here briefly. For a more detailed description and review of the therapy studies with adults, see Rehm and Kaslow (1984).

Activity increase programs derive primarily from the clinical and research work of Peter Lewinsohn at the University of Oregon. Lewinsohn (e.g., Lewinsohn, Biglan, & Zeiss, 1976) argues that depression is the consequence of a loss or lack of response-contingent positive reinforcement. One way in which such situations may come about is that the environment is poor in providing events or activities that are reinforcing. This situation may occur because of changes in the environment (e.g., loss). The resulting therapy is to attempt to get the person to engage in relevant activities that will be intrinsically reinforcing. A variety of scheduling and reinforcement techniques are used to get the individual to increase his or her activities. In the program with adults, the initial activity level is assessed, and the activities targeted for increase are selected with the use of an instrument developed by Lewinsohn and his colleagues (MacPhillamy & Lewinsohn, 1982) termed the Pleasant Events Schedule (PES). There is currently no directly comparable instrument for use with children. However, the Children's Reinforcement Survey Schedule (CRSS; Cautela, 1977) comes close for certain purposes. The CRSS was developed to parallel the Cautela and Kastenbaum (1967) Reinforcement Survey Schedule for adults. The instrument was developed to identify potential reinforcers to be used in contingency management programs. Unlike the Pleasant Events Schedule, the CRSS does not provide a means for assessing overall activity level as an assessment of deficit or as an outcome measure. However, it could be useful in selecting targets for activity increase.

Social skill approaches derive partly from the assumption that individuals are unable to obtain satisfaction or reinforcement from their environment because of deficient social skills. A variety of social skill, assertion, and marital communication programs have been evaluated with regard to their effectiveness in treating depression. Case reports of treating depression in children with social skills training have appeared in the literature (e.g., Calpin & Cincirpini, 1978; Calpin & Kornblith, 1978; Frame, Matson, Sonis, Fialcor, & Kazdin, 1982; Matson & Esveldt-Dawson, Andrasik, Ollendick, Petti, & Hersen, 1980; Petti *et al.*, 1980). Both of the Calpin studies assessed social skills in children using the Behavioral Assertiveness Test for Children (BAT-C; Bornstein, Bellack, & Hersen, 1977). The BAT-C is modeled after behavioral assertiveness tests that have been used for assessing social skills in adults. Social skill training with children is rapidly developing as an intervention strategy for a variety of children's problems, and assessment methodology in that area is likely to develop rapidly with respect to depression. Similarly, more recent research has shown a



relationship between childhood depression and social skills deficits (Helsel & Matson, 1984).

Cognitive-behavioral approaches to depression derive primarily from Beck's view (1972) of depression as essentially a cognitive disorder. In Beck's view the essence of depression is the cognitive triad of a negative view of self, world, and the future. Beck attributed this negative view to distortions of events and experiences and identified specific forms of distortion. Therapy that derives from this view (Beck, Rush, Shaw, & Emery, 1979) helps individuals to identify their own distortions and automatic negative thoughts by a variety of cognitive and behavioral interventions. The program has been evaluated in a number of well-controlled outcome studies (e.g., Rush, Beck, Kovacs, & Hollon, 1977). The approach has also generated assessment instruments for evaluating depressive cognitions in adults, for example, the Dysfunctional Attitude Scale (Weissman & Beck, 1978) and the Automatic Thoughts Questionnaire (Hollon & Kendall, 1980).

No direct parallel has yet been developed for children. However, existing measures of self-esteem in children may provide something of a parallel in that they similarly assess negative characteristics attributed to the self. The Coopersmith Self-Esteem Inventory (CSEI; Coopersmith, 1967) is a 58-item self-report scale for children and young adults. The measure consists of five subscales: (1) general self; (2) school and academic; (3) home and parents; (4) social self and peers; and (5) a lie scale. The relationship between depression and CSEI scores in school-aged children has been found, with more depressed children reporting lower self-esteem (Leventon, 1982). Another frequently used measure of self-esteem in children is the Piers-Harris Self Concept Scale (Piers & Harris, 1969). This measure is an 80-item self-report inventory designed to reflect the degree of global self-esteem in children from 8 to 17 years of age. These instruments may evaluate the desirability of using a cognitive-behavioral-based therapy intervention with a depressed child.

A couple of therapy programs used with children have made extensive use of cognitive techniques. Craighead, Wilcoxin-Craighead, and Meyers (1978) described a positive self-statement training program for modifying self-concept. Butler and Miezig (1980) described an overall program for dealing with depression in the classroom. The central focus of the program is cognitive techniques for increasing self-esteem among children. These include frequent and regular approaches to the child, expressions of acceptance and affection, and the assignment of tasks that ensure successful experiences.

Another important theoretical approach to depression has been Seligman's learned helplessness model (1975). In a revision of the model (Abramson, Seligman, & Teasdale, 1978), the key deficit in depression is seen as a negative attributional style. Attribution theory, adapted from social psychology, holds that individuals attribute causes of the events in their lives to factors that may be classified as internal or external, and as stable or unstable. Seligman added to these dimensions the dimension of global or specific causes. Depressed individuals tend to make attributions about negative events to internal, stable, and global causes. That is, if something bad happens, "It's because of me; it's be-

cause of something that is always true about me; and it's because of something that is true about me in many situations." On the other hand, if a positive event occurs, attributions are made to external, unstable, specific causes: "Someone else made it happen; it won't happen again; and just because it happened in this situation, doesn't mean it will happen anywhere else." This negative attributional style is symptomatic of depression and can be seen as a vulnerability factor that interacts with actual negative life events.

Seligman (1981) outlined a number of therapy approaches that are consistent with his model. Primary among these is the direct modification of attributional style. Attributional style in adults is assessed by the Attributional Style Questionnaire (Seligman, Abramson, Semmel, & von Baeyer, 1979). A parallel instrument has been developed for children, commonly referred to as the KASTAN (Kaslow, Tanenbaum, Abramson, Peterson, & Seligman, 1983). It consists of 48 items, 16 of which pertain to each of the three attributional dimensions (internal-external, stable-unstable, and global-specific). Each item consists of a description of a situation and two statements about why the situation may have occurred. Children choose one of the two statements as if the incident had happened to them. Kaslow (1981) found moderately high correlations between attributional style and depression. Seligman, Peterson, Kaslow, Tanenbaum, Alloy, and Abramson (1984) reported that, among normal children, there was a moderate relationship between level of depression scores and both internal-global-stable attributions for failure and external-specific-unstable attributions for success.

Although no program specifically using attribution retraining for depression in children has been reported, an applicable program has been described by Dweck (1975). This work was with children who had extreme negative reactions to failure. In Dweck's study, the experimental group was given attribution retraining consisting of teaching them to take responsibility for their failures but to attribute them to unstable causes (e.g., lack of effort). After training, the experimental children maintained or improved their academic performance and problem-solving ability.

Rehm's self-control model of depression (1977) is an attempt to provide a broad self-management theoretical framework for conceptualizing key deficits in depression. The model suggests that depressed individuals' self-management behavior is characterized by six specific deficits: (1) selective attention to negative events; (2) selective attention to immediate as opposed to long-term consequences of events; (3) stringent self-evaluative standards; (4) negative attributional style; (5) insufficient contingent positive self-reinforcement; and (6) excessive self-punishment. Based on this model, a highly structured group-format therapy program was developed. The therapist presents didactic information concerning each deficit and discusses the ideas with the participants as they apply to individuals. The participants complete exercises during the sessions to help them understand the concepts and are then given homework assignments to apply each concept during the week between sessions. The program has been refined and evaluated in a series of studies in Rehm's lab and elsewhere (see Rehm, 1984).

In the adult studies, the Self-Control Questionnaire (Fuchs & Rehm, 1977) has been used to assess changes in self-control attitudes and beliefs during therapy. No scale precisely paralleling this development has occurred for children, but two self-control scales for children have been reported that may be applicable to assessment for this form of treatment. The "Usually That's Me" scale developed by Humphrey (1982) consists of 11 self-report items that measure children's perceptions of their self-control, as well as a 15-item teacher rating scale of the child's self-control behaviors. Depressed children have been found to score on the self-report scale as having more self-control problems than nondepressed children (Kaslow, 1983). A second measure of self-control in children is the Self-Control Rating Scale (Kendall & Wilcox, 1979). This scale contains 33 items to be rated by teachers on 7-point scales with items indicative of self-control, impulsivity, or both. Although the relationship between this self-control scale and depression in children is unknown, relationships have been found between the Self-Control Rating Scale and both internalized and externalized behavioral problems as assessed by the Achenbach Child Behavior Checklist—Teacher Version (Kendall, Zupan, & Braswell, 1981).

An adaptation of the self-control therapy program for children was described by Stark, Kaslow, and Reynolds (1985). Twenty-nine moderately depressed schoolchildren were assessed on an unpublished depression scale and on the Children's Depression Rating Scale-Revised (Poznanski *et al.*, 1984) as assessments of global depression. Self-control was assessed by the "Usually That's Me" self-report scale. The self-control program was compared to an activity increase program and a waiting-list control. Experimental subjects met in groups 12 times over a five-week period. Both experimental groups improved over waiting-list subjects on global depression. The "Usually That's Me Test" did not discriminate between the groups at posttest. Thus, the therapy program may not have had as specific an effect as intended on the self-control constructs as measured by the "Usually That's Me Test." What is assessed by this test, however, is somewhat different than the self-control concepts targeted by the therapy program.

In general, the field of therapy for depression in children is an extremely young one. As is suggested above, the most likely developments in this area will be applications of techniques developed with adults and adapted for work with children. The assessment of specific target behaviors will most likely develop by adapting methods of assessment that have been applied to adults, as well as methods of assessments that have been applied to children for other purposes. Additional work is also needed to develop and refine the methods of assessing depression globally and of determining the relationship between the specific and global measures.

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# 15      *Anxiety Disorders*

GRETA FRANCIS AND THOMAS H. OLLENDICK

The field of clinical behavior therapy can trace its beginning to the examination of anxiety in children. Watson and Rayner's demonstration of conditioned fear in Little Albert (1920) and Jones's subsequent treatment of fear in Peter (1924) provided auspicious support for the newly developed theory of behaviorism. Barrios, Hartmann, and Shigetomi (1981) commented that, with such an impressive beginning of the study of childhood anxiety, one might expect that the assessment and treatment of childhood fear and anxiety would be firmly established. In fact, there are few well-controlled investigations of fears and anxiety in children (Ollendick, 1979), and we have little understanding of just what constitutes anxiety in children. We still have much to learn regarding the nature and treatment of childhood fears and anxiety.

The purpose of this chapter is to examine the current state of knowledge about childhood anxiety. The emphasis is on diagnostic and assessment issues. In particular, we discuss definition, classification, normative considerations, and diverse assessment procedures in order to gain a better understanding of childhood anxiety and its concomitants.

## DEFINITION

In general, the terms used to describe anxiety in children are *fear*, *anxiety*, and *phobia*. Common to the definition of these terms are avoidance behaviors, autonomic nervous system reactions, and subjective feelings of nervousness and distress. Although these terms have often been used interchangeably, individuals within and across theoretical schools have tended to disagree on their specific definitions or correlates. In fact, Morris and Kratochwill (1983) concluded that to say there are problems with the definitions of fear, anxiety, and phobia is an understatement at best.

First, we attempt to define the terms and then to distinguish among them. *Fear* is a normal reaction to a real or perceived threatening object or situation. Fear reactions include subjective feelings of being scared and nervous, avoidance of the feared stimulus, and physiological activity such as increased heart rate and rapid breathing.

A *phobia*, on the other hand, is a special form of fear that is disproportional to the degree of threat posed by the feared stimulus. Miller, Barrett, and Hampe (1974) defined a phobia as anxiety that is attached to a specific nonthreatening stimulus, that is out of proportion to situational demands, that cannot be reasoned away, that is out of voluntary control, that leads to avoidance of the phobic stimulus, that persists over time, that is maladaptive, and that is not age-specific.

Finally, from our perspective, *anxiety* refers to a set of physiological reactions, subjective feelings of distress, and avoidance behaviors that occur without obvious precipitating external threats or clear antecedent stimulus events. Thus, anxiety is usually diffuse and not specific to certain stimuli. Nietzel and Bernstein (1981) proposed the following social learning theory conceptualization of anxiety: (1) anxiety is not a trait or a personality characteristic; (2) anxiety can be acquired through learning; (3) anxiety has multiple response components; and (4) these response components need not be highly interrelated.

The task of meaningfully differentiating among fear, phobia, and anxiety is difficult, given the obvious similarities in their definitions. Barrios *et al.* (1981) and Miller *et al.* (1974) have suggested that fears and phobias can be distinguished on the basis of persistence, magnitude, and maladaptiveness. That is, the anxiety associated with phobias is generally more persistent, is maladaptive, and is of greater magnitude than the anxiety associated with fears. The differences between fear and anxiety are less apparent however. According to Miller (1983), fear and anxiety can be distinguished by the degree of threat posed by the "threatening" stimulus. Of course, this distinction leads to questions about the perception of threat versus the actuality of threat. If a child perceives something as threatening but an adult perceives the same object as benign, is the child anxious or fearful of the object? Furthermore, is it important for us to be able to distinguish among fear, anxiety, and phobia? Some say that, from a clinical treatment standpoint, it makes little difference whether a given reaction reflects fear or anxiety. However, others feel that the distinction is important both conceptually and clinically. For example, certain treatment techniques appear to be more efficacious with circumscribed fear than with diffuse anxiety reactions. A child presenting with a specific circumscribed fear would be treated differently from a child presenting with multiple, vague worries and concerns. For example, a child who is afraid of the dark might be best treated with systematic desensitization or cognitive restructuring, whereas a child with vague worries and concerns about everything (e.g., the "worrywart") might be best treated with relaxation training or general coping strategies. Vague, difficult-to-operationalize fears lend themselves less well to highly specific procedures like systematic desensitization (Ollendick & Cerny, 1981).

## CLASSIFICATION

Given the lack of an agreed-upon definition of anxiety in children, the task of classification and diagnosis is a complex one. Classification of the anxiety disorders of childhood has been proposed from both nosological and empirical

bases. Those classification schemes based on nosological methods emphasize the essential features and the duration of each disorder as a way of making differential diagnoses. The essential features of each disorder are usually derived from clinical observation of the disorder. In contrast, classification based on empirical methods generally uses statistical techniques such as factor analysis to determine the features common to each disorder.

Probably, the best example of a nosological approach to classification is the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III; American Psychiatric Association, 1980). The DSM-III recognizes three distinct types of anxiety disorders of childhood: separation anxiety disorder, avoidant disorder, and overanxious disorder. Although anxiety is the predominant clinical feature of each, the focus of anxiety is situation-specific in separation anxiety and avoidant disorders but is generalized to various situations in the overanxious disorder. In addition, the DSM-III recognizes phobic disorders in which anxiety is also the predominant feature. According to the DSM-III, the essential features of phobic disorders are the same in children and adults; thus, no special subcategories are provided for children.

### *Phobic Disorders*

The essential feature of phobic disorders is irrational and persistent fear of a specific object or situation, coupled with an overwhelming desire to avoid contact with the phobic stimulus. Generally, the individual recognizes that the fear is excessive given the actual threat of the object or situation. The avoidance behavior can be quite disruptive and distressing to the individual, as it may interfere with social functioning. Phobic disorders are divided into three types; agoraphobia, social phobia, and simple phobia. According to DSM-III, the typical age of onset of agoraphobia is not until the late teens or early twenties. The phobias most likely to occur in childhood are social phobias and simple phobias. In social phobias, the persistent fear and avoidance behavior revolves around situations in which the individual is exposed to the scrutiny of others and fears that he or she may behave in a humiliating or embarrassing manner. Examples of social phobias include fear of public speaking, eating in public places, or using public lavatories. Apparently, this disorder often emerges in late childhood or early adolescence.

A diagnosis of simple phobia is made when the persistent irrational fear and avoidance behavior are caused by something *other than* being alone, being away from home, or embarrassment in social situations. Instead, the phobic stimuli in simple phobias include animals, closed spaces, or heights. Although the age of onset of most phobias varies, animal phobias are said nearly always to begin in childhood.

### *Separation Anxiety Disorder*

The essential feature of the separation anxiety disorder is excessive anxiety when faced with separation from persons to whom the child is attached. Such anxiety can be manifested in a number of ways. These children may have exag-

gerated and unrealistic worries that they will be separated from major attachment figures (e.g., that harm will come to their parent or themselves, or that their parents will leave and never return). Therefore, they may express persistent reluctance or refusal to sleep alone or to go to school in order to remain with major attachment figures. In fact, such children often avoid being left alone at home and complain of physical distress on school days (e.g., nausea or headaches). This excessive anxiety, which may reach panic proportions, is evident even when the child merely considers or anticipates separation. Additionally, social withdrawal, depression, or problems in concentrating may result when such children are not with major attachment figures. These disturbances may occur in children as young as preschool age and are equally common in both sexes. The duration of the difficulties must be at least two weeks in order to warrant a DSM-III diagnosis of separation anxiety disorder. The magnitude of the disorder can range from relatively mild (e.g., the child expresses some anxiety and reluctance to separate from the parents but can function adequately in novel situations) to quite severe (e.g., the child panics at the very thought of separation from the parents and refuses to attend school or to remain at home alone). These difficulties may develop in children as young as 2½ years old. Such symptoms in children younger than 2½ are likely to be due to the normal developmental phenomenon of stranger anxiety and thus would not be diagnosed.

### *Avoidant Disorder*

The essential features of the avoidant disorder are persistent and excessive avoidance of contact with strangers sufficiently severe to disrupt social functioning, coupled with an expressed desire for social acceptance. Children with this disorder tend to have satisfactory interpersonal relationships with family members but not with their peers. They tend to be shy, timid, and easily embarrassed and may feel isolated and depressed. These children avoid interacting with their peers even though they seem interested in forming social relationships. In order to warrant a DSM-III diagnosis of avoidant disorder, these problems must be evident for at least six months. At present, no information is available on the sex ratio of the disorder.

### *Overanxious Disorder*

The essential feature of the overanxious disorder is excessive worrying that is not situation-specific but that is generalized to a variety of situations and is not related to any recent identifiable stress. Children who have this disorder often worry about the future and are preoccupied with the appropriateness of their own past behavior. They are overly concerned about what others may think of their behavior and are in need of constant reassurance. Such children also complain of physical distress (e.g., dizziness, shortness of breath, or headaches) and are self-conscious and are embarrassed easily. They present persistent anxiety

TABLE 1. Characteristics of the Anxiety-  
Withdrawal Dimension<sup>a</sup>

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Anxious, fearful, tense
Shy, timid, bashful
Withdrawn, seclusive, friendless
Depressed, sad, disturbed
Hypersensitive, easily hurt
Self-conscious, easily embarrassed
Feels inferior, worthless
Lacks self-confidence
Easily flustered
Aloof
Cries frequently
Reticent, secretive

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<sup>a</sup>Adapted from Quay (1979).

and/or an inability to relax. Given the numerous somatic complaints of these children, they often undergo unnecessary medical evaluations. At present, there is no information concerning the age of onset of this disorder. Generally, it is more common in males than in females. These difficulties must be apparent for at least six months in order to warrant a DSM-III diagnosis of overanxious disorder.

In contrast to the nosological approach to classification, a number of researchers have proposed empirically based classification schemes. Some research has attempted to classify childhood psychopathology by using child-rating checklists and scales. Quay (1979) reviewed this literature and concluded that a number of dimensions appear consistently across samples: conduct disorder, anxiety-withdrawal, immaturity, and socialized aggression. The anxiety-withdrawal dimension is characterized by withdrawal, isolation, and subjectively experienced anxiety. Additional characteristics of this dimension are described in Table 1.

Other researchers have examined parent and teacher ratings of childhood psychopathology and have identified two broadband dimensions: externalizing (or undercontrolled) and internalizing (or overcontrolled) (e.g., Achenbach & Edelbrock, 1978; Ross, 1980). Achenbach and Edelbrock (1978) reviewed multivariate studies and reported that a broadband overcontrolled syndrome was found consistently in 14 different studies. Anxiety disorders fall within the internalizing or overcontrolled dimension and are characterized by apathy-withdrawal and cooperation-compliance (e.g., Kohn & Rosman, 1972). According to Achenbach (1985), hierarchical multivariate analyses have also yielded narrower-band syndromes that are similar to diagnostic categories within the two broadband dimensions. The overcontrolled dimension is comprised of anxiety, somatic complaints, depression, withdrawal, obsessions-compulsions, and schizoidlike behavior, and the undercontrolled dimension is comprised of aggressive, hyperactive, and delinquent behavior.

Naturally, each approach to classification has both benefits and limitations.

The nosological approach makes good intuitive sense. That is, it allows us to describe many of the behavior disorders seen clinically in children. In addition, the DSM-III provides a considerable improvement over the DSM-II in its specificity of diagnostic criteria. It was hoped that this specificity would facilitate research on the reliability and validity of the diagnoses. At this point, however, such research has not come about, and there is little information available about the reliability and validity of the diagnoses. This problem seems especially salient for the anxiety disorders, where diagnostic agreement is often low. For example, Mattison, Cantwell, Russell, and Will (1979) reported that the DSM-III was notably weak in reliably identifying anxiety disorders in children.

According to Miller (1983), this classification scheme assumes that categories or diagnoses are discrete; therefore, the correlation among symptoms within a diagnosis is greater than the correlation of symptoms between diagnoses. This question is an empirical one that needs to be addressed. In addition, the DSM-III provides imprecise information about epidemiology, and the diagnoses seem to have little relationship to prognosis or treatment. Finally, there is still heavy reliance on the medical model within the DSM-III; thus, diagnoses may be based on debatable theoretical notions within the empirical approach to classification.

Overcontrolled disorders do seem to be distinguished consistently from undercontrolled disorders, however (Achenbach & Edelbrock, 1978; Ross, 1980). In particular, Lapouse and Monk (1959) found no correlation between the number of childhood fears and other deviant behaviors such as bed-wetting or nightmares.

In contrast, distinctions *within* the overcontrolled dimension have proved more difficult. Although the DSM-III lays out different types of childhood anxiety disorders and Achenbach proposed narrower-band syndromes, little empirical evidence is available with which to make such distinctions. Therefore, it is difficult to distinguish among anxiety, depression, and social withdrawal in children. Often, children who are anxious also report significant depression or social withdrawal. In fact, a DSM-III diagnosis of avoidant disorder requires both anxiety and social withdrawal. Few studies have examined the relationship among depression, anxiety, and social withdrawal in children. We have begun a study looking at the role of anxiety and depression in socially withdrawn children (Francis, 1985).

A benefit of the empirical approach to classification is the generation of objective data that can be classified reliably and validly (Morris & Kratochwill, 1983). Unfortunately, there is some question about the utility of such broad, general dimensions. That is, the overcontrolled dimension includes depression, anxiety, and social withdrawal as noted above. At this point, we know little about the relationships among these disorders. There are also a number of limitations inherent in the methodology used to derive the behavioral dimensions. Quay (1979) questioned whether different dimensions may result from different samples and methods. For example, human judgment enters into the statistical procedure of factor analysis when deciding which behaviors to enter or which to label with different factors. If a particular behavior is excluded from the analysis, it cannot be expected to appear in a factor cluster.



## NORMATIVE AND DEVELOPMENTAL CONSIDERATIONS

A number of normative and developmental factors must be considered in the examination of childhood fear and anxiety: the prevalence of fear and anxiety in normal children, sex differences, age differences, and socioeconomic differences.

There is evidence to suggest that normal children evince a surprisingly large number of fears. For instance, Jersild and Holmes (1935) reported that 2- to 6-year-olds had an average of four to five fears, and MacFarlane, Allen, and Honzick (1954) found that 90% of 2- to 14-year-olds reported a specific fear at least once. Additionally, 43% of mothers reported that their children had seven or more fears, and 15% of mothers reported that their children exhibited three or more anxious behaviors, such as nail biting or thumb sucking (Lapouse & Monk, 1959). Although the incidence of common fears is relatively high, severe fears and phobias account for a small percentage of child psychiatric referrals (Graziano & DeGiovanni, 1979).

Data are conflicting about the persistence of childhood fear and anxiety. Some evidence suggests that common childhood fears are somewhat transient (e.g., Hagman, 1932; Marks, 1969). In contrast, more severe fears and anxieties appear to evince a more chronic course (Poznanski, 1973). At this point, we have a paucity of data concerning the potential negative long-term effects of childhood anxiety disorders.

The data about sex differences in the type and intensity of childhood anxiety and fear are also mixed. For example, some researchers have found that girls score higher on fear measures than do boys (e.g., Croake, 1969; Lapouse & Monk, 1959; Ollendick, 1983; Ollendick, Matson, & Helsel, 1985; Scherer & Nakamura, 1968), whereas others have found no sex differences (e.g., Miller, Barrett, Hampe, & Noble, 1971). Further, girls and boys have been shown to differ in their fears depending on the assessment devices and procedures used. Maccoby and Jacklin (1974) found that studies that use self-report and teacher ratings typically find sex differences, whereas behavioral observation studies do not. In addition, Graziano and DeGiovanni (1979) questioned whether reported sex differences reflect greater fear reactivity or sex-role expectations. That is, girls may be more willing to report fears, or teachers may incorrectly, yet reliably, attribute greater fear to girls than to boys.

Age is another important variable to consider when examining children's fears and anxieties. There is evidence to suggest that the number of reported fears declines with age (Graziano & DeGiovanni, 1979). Although this trend has been observed reliably, MacFarlane *et al.* (1954) also found a peak in the number of fears reported at around age 11. The kinds of fears that children report also change as they get older. Young children tend to fear animals, the dark, and imaginary creatures (e.g., Bauer, 1976; Lapouse & Monk, 1959), whereas older children tend to display school and social fears (e.g., Angelino, Dollins, & Mech, 1956; Lapouse & Monk, 1959). Thus, it appears that fears change in content over time in correspondence with changes in cognitive development (Morris & Kratochwill, 1983).

Children of varying socioeconomic status (SES) have been found to differ in the number and type of their fears as well. Angelino *et al.* (1956) and Lapouse and Monk (1959) reported that lower-SES children had more fears and worries than higher-SES children. In addition, low- and high-SES children exhibited different types of fears. For example, low-SES children tended to fear rats and drunks, whereas high-SES children tended to fear car accidents.

In sum, there are a number of important normative and developmental variables to take into account when assessing and treating childhood fears and anxieties. In fact, Achenbach (1985) noted that children's behavior disorders often involve behaviors that are not intrinsically abnormal, but that are deviant in intensity, frequency, pervasiveness, or developmental parameter. For example, a fear of the dark may prove of minor concern in a very young child but may be worthy of serious consideration in a young adolescent.

## ASSESSMENT

This section focuses on the assessment of the motoric, cognitive, and physiological components of childhood anxiety. A comprehensive approach to assessment is warranted in order to identify the manner in which anxiety is exhibited in each child. Not all anxious children show motoric, cognitive, and physiological components of anxiety, however. Some children display only cognitive anxiety (e.g., unrealistic worries and concerns), whereas other children display both cognitive and motoric anxiety (e.g., unrealistic concerns and worries coupled with avoidance behavior). A thorough assessment provides important information for treatment planning and outcome evaluation. This information should guide the selection of appropriate treatment strategies. For example, an appropriate treatment for an anxious child displaying cognitive and motoric anxiety would target for change both the troublesome cognitions and the avoidance behaviors.

A comprehensive assessment of childhood anxiety includes measures of motoric, cognitive, and physiological responding. Our strategy is to begin with a broad assessment of the child and his or her environment (e.g., family, school, and peers) and to move toward gaining more specific information regarding response modes, antecedents and consequences, severity, duration, and pervasiveness as problem areas are uncovered (Ollendick & Hersen, 1984). Thus, the assessment procedure begins with a thorough behavioral interview.

### *The Behavioral Interview*

The behavioral interview is a necessary and important part of the assessment process. According to Ollendick (1983a), the purposes of the interview are to establish rapport with the child and family, to obtain information about the nature of the anxious behavior and its antecedents and consequences, and to determine the broader sociocultural context in which the anxious behavior occurs.

Interviewing an anxious child and his or her family requires an understanding that such a child may be timid, shy, and relatively unresponsive in the interviewing situation. Thus, it is frequently necessary to phrase questions in specific, simple terms that the child will understand and to provide additional support and encouragement for responding. For example, general questions such as "How is school?" may often result in unelaborated answers such as "OK" or "I don't know." More specific questions such as "What are your grades in school?" or "Whom do you play with at recess?" might be more easily understood by the child. In addition, it is helpful to use the child's own terms when discussing problem areas. For example, children may distinguish "nervous" (scared, upset) from "anxious" (eager, anticipatory) feelings. It is equally important to gain information from the family regarding their perceptions of the child's anxious behavior, as well as information regarding antecedents and consequences. Again, it is helpful to ask specific questions, such as "What is Tommy doing that makes you feel that he is anxious?"

In order to assist the child in describing the antecedents and consequences of the anxious behavior, it is often beneficial to instruct the child to imagine the anxiety-provoking situation and to describe exactly what is happening. At this time, the child is observed for signs of anxiety, such as crying, tremors, or flushing. This procedure has been described by Smith and Sharpe (1970) and by Ollendick and Gruen (1972).

In interviews, as in other assessment procedures, there are psychometric concerns. Often, children and parents are unreliable reporters of behavior, particularly past behavior. That is, parents and children may find it difficult to report and agree on the occurrence of behavior and whether such behavior is a problem. One way to maximize the reliability of reporting is to assess currently occurring behaviors and the conditions under which they are occurring (e.g., Herjanic, Herjanic, Brown, & Wheatt, 1975). Thus, the focus of the interview should be on the anxious behavior and its antecedents and consequences in the here and now.

As well as the general interviewing strategy described above, structured interview schedules are available. Kovacs (1978) and Hodges (1982) have developed two such schedules for diagnostic assessment purposes: the Interview Schedule for Children (ISC) and the Children's Assessment Schedule (CAS), respectively. These interview schedules allow the standardized administration of questions and observations of specific behaviors. For example, an examiner, using the CAS, questions the child about specific content areas (e.g., family, fears, worries, and moods) and records observations about the child's behavior. Questions tap the DSM-III diagnostic criteria for childhood anxiety disorders, conduct disorders, attention deficit disorders, pervasive developmental disorders, and depression. According to Hodges (1982), the CAS is a reliable and valid assessment instrument for use in making differential diagnoses and in determining the severity of problem behaviors. The CAS takes approximately 45 minutes to administer and is designed primarily for use with children aged 7-12. It is organized so that the content areas covered become progressively more difficult or anxiety-provoking as the examiner establishes rapport with the child.

TABLE 2. Selections from CAS Reflecting DSM-III Anxiety Disorders of Childhood or Adolescence<sup>a</sup>

Question	Answer indicative of symptom	Symptom indicative of DSM-III diagnoses
Some kids have nervous or jumpy feelings. How much do you feel nervous?	Nervous a lot, unable to relax	Overanxious disorder
Are you the kind of person who is easily embarrassed or worries a lot about what others think of them?	Yes	Overanxious disorder
Do you worry that a family member will die or be maimed?	Yes	Separation anxiety
Do you worry about being separated from your parents?	Yes	Separation anxiety
If child spends a lot of time alone: Do you not want to be by yourself so much, but you are shy?	Yes	Avoidant disorder
Are you afraid of strangers?	Yes	Avoidant disorder

<sup>a</sup>Adapted from Hodges (1982).

Examples of questions tapping childhood anxiety disorders from the CAS are displayed in Table 2.

The Interview Schedule for Children (Kovacs, 1978) was developed to assess the current status of children's problem behaviors. The ISC can be administered to the child or to the parent(s) and is appropriate for use with children aged 8–13. Although the questions on the ISC tap various content areas, the majority are pertinent to components of depression. Unlike the CAS, the ISC provides "symptom ratings" rather than differential diagnoses.

### *Behavioral Observations*

The most direct and least inferential manner in which to assess motoric behavior is to observe the behavior in the situations in which it occurs. Behavioral observations can be conducted in the natural setting or in a simulated setting. In a behavioral-observation coding system for childhood anxiety, a set of specific behaviors reflective of anxiety are operationally defined. Often, observation is also made of the antecedents and consequences of the anxious behavior. A number of authors have described clinical cases in which highly individualized behavioral observation systems have been used. For example, Neisworth, Madle, and Goecke (1975) detailed a set of operationally defined behaviors reflective of separation anxiety (e.g., crying and screaming) and observed these behaviors as well as their antecedent and consequent conditions before, during, and after treatment. Using this system, they were able to determine that the child's separation anxiety occurred in the preschool setting and was maintained by maternal attention. In addition, these observations were used to develop an intervention strategy appropriate to the particular antecedent and consequent conditions.

TABLE 3. Behavioral Indices from Preschool Observation Scale of Anxiety<sup>a</sup>

- 
1. Physical complaint
  2. Desire to leave
  3. Expression of fear or worry
  4. Cry
  5. Scream
  6. Whine or whimper
  7. Trembling voice
  8. Stutter
  9. Whisper
  10. Silence to one question in the interval
  11. Silence to more than one question in the interval
  12. Nail-biting
  13. Lip-licking
  14. Fingers touching mouth area (without nail-biting)
  15. Sucking or chewing object (not fingernails)
  16. Lip contortions
  17. Trembling lip
  18. Gratuitous hand movement at ear area
  19. Gratuitous hand movement at top of head
  20. Gratuitous hand movement at an object separable from body or at part of clothing separate from body
  21. Gratuitous hand movement at some part of body (not ear, hair, mouth, or genitals)
  22. Gratuitous hand movement
  23. Gratuitous leg movement
  24. Gratuitous foot movement—below ankles
  25. Trunk contortions (e.g., arching back)
  26. Rigid posture during entire interval
  27. Masturbation
  28. Fearful facial expression
  29. Distraction—examiner must verbally remind child to pay attention
  30. Avoidance of eye contact
- 

<sup>a</sup>Adapted from Glennon and Weisz (1978).

More general behavioral-observation systems for childhood anxiety are less common than the individualized systems described in clinical treatment studies. A notable exception is the Preschool Observation Scale of Anxiety (POSA) developed by Glennon and Weisz (1978). The POSA includes 30 specific behavioral indices of anxiety to be observed in a standard time-sampling procedure. The behavioral indices include nail biting, avoidance of eye contact, silence to questions, and rigid posture (see Table 3). Although more information is needed regarding reliability and validity, this scale appears to be a promising clinical tool (Ollendick, 1983).

Although some behavioral indices of anxiety in children are likely to be similar across anxiety-provoking situations, others are likely to be quite different. For instance, both children who are anxious about leaving home and children who are anxious in the dentist's office may exhibit anxiety by crying or clinging to their parents. However, children with dental anxiety may also choke or refuse to open their mouths. This suggests that delineation of response categories be dictated by the characteristics of the specific anxiety-provoking situation (Barrios *et al.*, 1981). This would allow for more information about specific,

pertinent anxious behaviors and a more sensitive index of change for a particular child's anxious behaviors.

### *Behavioral Avoidance Test*

The Behavioral Avoidance Test (BAT) is another assessment device for motorically displayed anxiety (Lang & Lazovik, 1963). Typically, this procedure involves having the child enter a room containing the anxiety-provoking object and approach, ultimately handling, the object. According to Kazdin (1973), the BAT provides behavioral measures of avoidance such as the amount of time spent in the presence of the anxiety-provoking object, distance from the object, and the number and latency of approach responses. The limitations of behavioral avoidance tests have been described by Barrios *et al.* (1981) and include (1) procedures and instructions are not standardized; (2) there are few data available regarding the influence of procedural variations and demand characteristics on children's BAT performance; and (3) there are currently no data available about the reliability and validity of such tests with children.

### *Fear Survey Schedules*

Fear survey schedules are instrumental both in determining specific fear stimuli and in providing a general index of fearfulness. Scherer and Nakamura (1968) developed a Fear Survey Schedule for Children (FSSC) modeled after the Wolpe-Lang Fear Survey Schedule for Adults (Wolpe & Lang, 1964). Children are instructed to rate their fear of each item on a 5-point scale. Factor-analytic studies of the FSSC show that this 80-item scale taps major fears, fear of death, fear of the dark, and home-school fears (Scherer & Nakamura, 1968).

Modified versions of the FSSC have been developed by Ryall and Dietiker (1979) and by Ollendick (1983b). The Children's Fear Survey Schedule developed by Ryall and Dietiker (1979) is a short form of the FSSC that contains 48 specific fear items and 2 blanks for children to indicate additional fears not already listed. Each item is rated on a 3-point scale ranging from "not scared or nervous or afraid" to "a little scared" to "very scared." Although no information is available about the validity of this revised Children's Fear Survey Schedule, the authors have reported good test-retest reliability.

The Fear Survey Schedule for Children-Revised (FSSC-R; Ollendick, 1983) is another useful tool for determining specific fear stimuli related to children's anxious behavior. School-aged children are instructed to rate their fear of 80 specific fear items on a 3-point scale ranging from being frightened by the item "none," "some," or "a lot." Initial examination of this scale suggests it is a reliable and valid revision of the FSSC. For example, Ollendick and Mayer (1984) reported that this scale discriminated between "school-phobic" children whose fear related to separation anxiety and school-phobic children whose fear appeared to be related to specific aspects of the school situation. Further, the scale reliably discriminated between fears of blind children and fears of normally sighted children (Ollendick *et al.*, 1985).

### *Fear Thermometers*

Kelley (1976) developed a modified version of Walk's (1956) fear thermometer (1956). The child is instructed to indicate his or her level of fear according to levels of color on the thermometer. Other fear thermometers have used pictures of faces representing different levels of fear. The child is instructed to indicate which picture best reflects how he or she feels in the feared situation. Barrios *et al.* (1981) suggested that, despite problems with reliability and validity, this instrument shows promise in simplifying the child's task by eliminating potential variability due to differences in language ability among children.

### *Louisville Fear Survey for Children*

The Louisville Fear Survey for Children (LFSC; Miller, Barrett, Hampe, & Noble, 1972) is an 81-item scale covering a variety of fears; it is appropriate for use with children aged 4–18. The LFSC can be given to the child or to significant others, such as parents or teachers. The rater is instructed to indicate the child's level of fear on a 3-point scale ranging from "no fear" to "normal or reasonable fear" to "unrealistic or excessive fear." Although no data are currently available regarding the psychometric properties of the child ratings, there is evidence to suggest that adult ratings allow differentiation of school phobia into school fears and separation anxiety (Miller *et al.*, 1972). This finding is similar to the results of Ollendick and Mayer (1984) in which subtypes of school phobia were identified by the revised Fear Survey Schedule for Children. Unfortunately, Miller *et al.* (1972) reported that child and parent ratings do not correspond well and thus are not interchangeable. Perhaps anxious children have a number of worries that they do not share with their parents. Indeed, we have noted that parents often respond with surprise when they learn the number and kinds of worries or fears that their children report to a therapist.

### *Child Behavior Checklist*

The Child Behavior Checklist (CBC; Achenbach, 1978; Achenbach & Edelbrock, 1979) has been used extensively in factor-analytic studies by Achenbach and his colleagues. Parents and teachers fill out this 138-item scale which taps behavior problems and social competence. Social competence items assess the child's participation in social organizations, activities, and school. The behavior problem items are rated on a 3-point scale that shows how well each describes the child. The inclusion of social competence and behavior problem items allows for a comprehensive assessment of the child's strengths and weaknesses. In addition, the scale allows for the identification of children who display anxiety, social withdrawal, obsessions-compulsions, depression, noncommunicative behavior, hyperactivity, aggression, and somatic complaints. Specific anxiety items include "clings to adults," "school fears," and "shy, timid." This scale has been found to be reliable and valid and provides important normative data for assessing both gender and developmental differences.

TABLE 4. Revised Behavior Problem Checklist: Anxiety–Withdrawal Items<sup>a</sup>

---

Self-conscious, easily embarrassed
Feels inferior
Shy, bashful
Lacks self-confidence
Hypersensitive, feelings are easily hurt
Generally fearful, anxious
Depressed, always sad
Says nobody loves him or her
Difficulty in making choices, can't make up mind
Afraid to try new things for fear of failure
Feels he or she can't succeed

---

<sup>a</sup>Adapted from Quay and Peterson (1983).

### *Revised Behavior Problem Checklist*

Parents and teachers can fill out the Revised Behavior Problem Checklist (Quay & Peterson, 1983). This checklist consists of 89 problem behaviors that are rated on a 3-point scale ranging from "not a problem" to "mild problem" to "severe problem." Factor analyses of the scale yielded the following dimensions: conduct problem, socialized aggression, attention problem-immaturity, anxiety-withdrawal, psychotic behavior, and motor excess. Examples of behaviors indicative of the anxiety–withdrawal dimension are displayed in Table 4. Like the CBC, the Problem Behavior Checklist is a useful tool with which to assess significant others' reports of children's anxious behavior.

### *Children's Manifest Anxiety Scales*

The assessment of children's cognitive behavior is currently a little-researched area (Kendall & Korgeski, 1979). This situation is true especially for the cognitions of anxious children. Very few instruments are available to assess the cognitions of anxious children. The majority of available instruments are self-report measures of general anxiety.

The Children's Manifest Anxiety Scale (CMAS; Castaneda, McCandless, & Palermo, 1956) is a scaled-down version of the Manifest Anxiety Scale for Adults (Taylor, 1951). This scale consists of 42 anxiety items and 11 lie items that assess a child's chronic anxiety. Reynolds and Richmond (1978) developed a revised version of the CMAS entitled, "What I Think and Feel" (CMAS-R). The purpose of this 37-item revision was to clarify the wording of items, to decrease the administration time, and to lower the reading level (Barrios *et al.*, 1981). The CMAS-R is suitable for primary-grade children and provides normative information for a variety of child groups (Reynolds & Paget, 1982). The scale yields three anxiety factors: physiological, worry-oversensitivity, and concentration (Reynolds & Richmond, 1978). Items from the CMAS-R are displayed in Table 5.



TABLE 5. Anxiety Items from CMAS-R ("What I Think and Feel")<sup>a</sup>


---

I have trouble making up my mind
I get nervous when things do not go the right way for me
Others seem to do things easier than I can
Often I have trouble getting my breath
I worry a lot of the time
I am afraid of a lot of things
I get mad easily
I worry about what my parents will say to me
I feel that others do not like the way I do things
It is hard for me to get to sleep at night
I worry about what other people think of me
I feel alone even when there are people with me
Often I feel sick in my stomach
My feelings get hurt easily
My hands feel sweaty
I am tired a lot
I worry about what is going to happen
Other children are happier than I
I have bad dreams
My feelings get hurt easily when I am fussed at
I feel someone will tell me I do things the wrong way
I wake up scared some of the time
I worry when I go to bed at night
It is hard for me to keep my mind on my schoolwork
I wiggle in my seat a lot
I am nervous
A lot of people are against me
I often worry about something bad happening to me

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<sup>a</sup>Adapted from Reynolds and Richmond (1978).

### *General Anxiety Scale for Children*

Another often employed measure of the cognitive components of anxiety is the General Anxiety Scale for Children (GASC; Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960). This scale was originally developed to examine the relationship between test anxiety, measured by the Test Anxiety Scale for Children (TASC; Sarason *et al.*, 1960), and general anxiety. This 45-item scale assesses cross-situational cognitive anxiety. The GASC has been criticized, however, as containing items that lack adequate specificity and detail; thus, is used infrequently by behaviorally oriented clinicians (Barrios *et al.*, 1981).

### *State-Trait Anxiety Inventory for Children*

The State-Trait Anxiety Inventory for Children (STAIC; Spielberger, 1973) contains two 20-item scales that are purported to tap cognitive trait and cognitive state anxiety in school-aged children. On the State Anxiety Scale, the child is instructed to indicate how he or she feels "right now, at this very moment,"

and on the Trait Anxiety Scale, the child is instructed to indicate how he or she "usually feels." This distinction between trait and state anxiety has been questioned. If there is a distinction between trait and state anxiety as measured by the STAIC, one would expect trait scores, but not state scores, to correlate highly with other trait anxiety measures. In fact, the Trait Anxiety Scale has *not* been found to correlate with other measures of trait anxiety (e.g., the CMAS) more highly than with the State Anxiety Scale (e.g., Finch & Nelson, 1974; Montgomery & Finch, 1974). These scales have been widely researched and have generally been found to possess adequate psychometric properties, however (Ollendick, 1983).

### *Cognitive Self-Statement Tests*

Children's cognitions can be assessed by self-statement tests. Self-statement tests are usually administered following participation in a simulated or real-life anxiety-provoking situation. Such tests consist of a list of statements, and the child is instructed to indicate which thoughts he or she was thinking during the task. Although this means of assessing the cognitions of children has been advocated (e.g., Morris & Kratochwill, 1983), there are few examples of self-statement tests for anxious children. Two notable examples are Zatz and Chassin's assessment of the self-statements of test anxious children (1983) and Stefanek's assessment of the self-statements of socially withdrawn children (1984). Zatz and Chassin (1983) developed the Children's Cognitive Assessment Questionnaire (CCAQ) to tap the self-statements of test-anxious children. The CCAQ contains four subscales: positive evaluation, negative evaluation, on-task thoughts, and off-task thoughts. Examples of CCAQ items are displayed in Table 6. The authors reported that high-test-anxious children endorsed more negative evaluation and off-task thoughts than did low-test-anxious children.

Similarly, Stefanek (1984) examined children's inhibiting and facilitating self-statements in response to a number of role-playing situations in which the child was in conflict with, or was to initiate an interaction with, a peer. He

TABLE 6. CCAQ Example Items<sup>a</sup>

<i>Positive Evaluation</i>	I usually do better than other kids. I am bright enough to do this. I am doing the best that I can.
<i>Negative Evaluation</i>	I have a bad memory. I'm doing poorly. I can't do this—I give up.
<i>On-Task Thought</i>	Pay attention. The harder it gets, the more I need to try. Take it one step at a time.
<i>Off-Task Thought</i>	I wish I were playing with my friends. I wish I were home. I wish this was over.

<sup>a</sup> Adapted from Zatz and Chassin (1983).

TABLE 7. CCAQ-R Example Situation and Items

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**Sample scene**

Imagine that you are on the playground and a child whom *you don't know* has a ball. He or she is walking around and playing with the ball. You really would like to play with that ball now, too. Remember, this child is someone whom *you don't know*.

**Instructions before CCAQ-R**

Children often think different kinds of things when they are in situations like the one you just pretended to be in. Read each thought listed below and circle "yes" or "no" to show whether you might think that if you were *really* in that situation. There are no right or wrong answers.

**Example items**

Positive evaluation: I do well in situations like this.

Negative evaluation: The other child probably thinks I'm dumb.

On-task thought: I have a plan to use in this situations.

Off-task thought: I wonder what the other child is thinking about me.

---

reported that socially withdrawn children endorsed more inhibiting and fewer facilitating self-statements than did their more well-adjusted peers.

We have developed a self-statement test for socially anxious children that combines aspects of Zatz and Chassin's CCAQ (1983) and Stefanek's self-statement test (1984). Children are instructed to pretend they are in a series of social situations involving a child whom they do not know. Following each scene, the child is asked to report on his or her thoughts. The list of possible self-statements is a slightly modified version of the CCAQ and includes positive evaluation, negative evaluation, on-task items, and off-task items. A sample of CCAQ-R for social anxiety is displayed in Table 7.

As noted above, the development of self-statement tests for anxious children is a recent phenomenon. A productive area of inquiry might be to replicate studies such as those of Zatz and Chassin (1983) and Stefanek (1984) in order to establish the psychometric properties of the procedure. Assessing the specific cognitions of anxious children will provide vital information in treating such children. That is, information would be available on the content of cognitions to be modified as well as the extent to which coping cognitions are extant in the child's repertoire.

### *Physiological Assessment*

Principles and procedures of the physiological assessment of children are in their infancy. No normative information is currently available about children's physiological responding in general, let alone physiological distinctions among emotional reactions. In one of the few discussions of the physiological assessment of childhood anxiety, Barrios *et al.* (1981) commented that little is known about the effects of laboratory or clinic setting, ambient noise, or instructional set on physiological responding in children.

An understanding of basic psychophysiology is a prerequisite of administering and interpreting physiological assessment. Obviously, a complete discussion of psychophysiological principles and procedures is beyond the scope of

this chapter. It is important, however, to be aware of desynchrony among physiological measures. That is, different measures appear not to relate directly and reliably to arousal (Lacey, 1959; Lacey & Lacey, 1967). Thus, multiple measures of physiological responding are strongly encouraged.

Although there are very few investigations of children's physiological responses to anxiety-provoking situations, the most commonly used measures of physiological responding are those that assess cardiovascular and electrodermal responses (Morris & Kratochwill, 1983). Cardiovascular responding can be assessed by measures of heart rate, blood pressure, and peripheral blood flow. Typically, the heart rate has been the most common measure because it is measured easily and is least sensitive to measurement artifacts (Nietzel & Bernstein, 1981).

Unfortunately, it is difficult to differentiate heart rate patterns in children. For example, Tal and Miklich (1976) reported increased heart rate in children when asked to imagine a fearful situation, and Johnson and Melamed (1979) reported increased heart rate in response to imaginal angry experiences. Similarly, Greenfield and Sternbach (1972) found a low correlation between physiologically responding as measured by heart rate and self-reports of fear. Thus, a change in heart rate in and of itself may indicate general emotional responding yet may provide no information about the nature of the emotional arousal. In summary, Nietzel and Bernstein (1981) cautioned that (1) heart rate is sensitive to motor and perceptual activity and thus may be confounded easily with stress; and (2) heart rate can be idiosyncratic in that it may increase or decrease or remain stable in response to anxiety-provoking stimuli.

Electrodermal responding is typically assessed through measures of skin conductance and skin resistance. Two examples of such measures are palmar sweat prints (PSP) and finger sweat prints (FSP). Melamed and her colleagues (e.g., Melamed & Siegel, 1975) reported electrodermal responding to be correlated with both self-reports and observations of dental fears and anxiety in children. Barrios *et al.* (1981) cautioned, however, that electrodermal responding is highly reactive and is thus responsive to a number of environmental and psychological artifacts.

In sum, although the investigation of the relationship between childhood anxiety and physiological responding holds promise, few conclusions can be drawn at this time. Given the lack of systematic, normative data regarding physiological responding in children and the expense (in money and time) of physiological assessment, it seems premature to advocate the regular use of such assessment techniques in clinical practice. Rather, it might prove fruitful to explore more fully the nature of psychophysiological responding in children via basic research.

### *Case Study*

The integrated assessment practices described above are illustrated here through the clinical case history of a highly anxious 11-year-old boy (Jimmy). Jimmy, the son of an accountant and an elementary-school teacher, had one

sister, age 7. The family was of German-Catholic descent and lived in a small southeastern university town. The mother was an avid reader, whereas the father spent much of his leisure time working on manually oriented activities (e.g., repairing the home and tinkering with objects). Jimmy, on the other hand, was reported by his parents to be somewhat awkward and clumsy and to be uninterested in mechanical or manual activities. He preferred to stay in the house and to read, much as did his mother. Furthermore, he was described by both parents as outgoing, highly sociable, and well-liked by the neighborhood children.

Jimmy and his parents were referred in mid-March by a middle-school guidance counselor because Jimmy had begun to miss school, to complain of stomachaches and headaches, and to appear "anxious or nervous most of the time." At school, he was described as a "loner," a child who had very few friends and who, at times, seemed "wierd" or "strange." The counselor and the teachers were most concerned about his lack of social interaction and his peculiar "habits," including the making of funny noises and contorted facial grimaces. The counselor reported that these behaviors had increased gradually over the past six months since Jimmy's enrollment in the middle school. The only other information available at the time of referral was that Jimmy was doing poorly academically (he had just received three D's and four C's on his grade report). Before this school year, Jimmy had attended a neighborhood elementary school and had earned all B's and A's.

An initial interview was scheduled for Jimmy and his parents. Before the interview, the parents filled out a brief questionnaire regarding background information and the reasons for referral. The parents and Jimmy were then escorted to the interview room by the therapist. Verbatim aspects of that first interview follow:

*Therapist:* In our session today, I would like each of you to help me get a better understanding of the problems going on in your family. I understand that Jimmy is having some academic difficulty in school and that he seems anxious much of the time, and that you, Mom and Dad, are concerned about Jimmy and his problems. Perhaps there are other problems as well that I am not aware of. Each of you has a different view on these problems, so I would like to hear from each of you. Before we begin, I realize that it is sometimes difficult to share your concerns openly in a session like this; nonetheless, if you want me to assist you, I must hear from each of you . . . you need to tell me, as well as each other, exactly what's going on. OK. Do you have any questions before we begin? Who would like to start?

*Mom:* I can begin. We're so upset about Jimmy. He seems so different . . . like he's nervous all the time . . . he's just not the same Jimmy. Well, we've been meeting with the counselor at school. It seems that he is not relating well to other children and that his grades are getting worse and worse. He just got a terrible report card. He . . . [The mother is interrupted by the therapist.]

*T:* So it sounds as if things have not been going well for Jimmy. Jimmy, I'm wondering how you feel about the things Mom just said. Tell me in your own words what's happening. [The therapist looks to Jimmy and touches him on the shoulder.]

*Jimmy:* I guess I'm not doing so well . . .

T: Tell me more about that.

J: [No response. Jimmy looks down to floor, folds and unfolds his hands, and moves restlessly in the chair.]

T: It's hard to talk about it, isn't it, Jimmy? Maybe Dad can help us out here. Dad, tell me how it looks to you.

Dad: Well, I don't know. Sometimes I think Jimmy is a lot like me . . . I didn't do well in school either and sometimes I like being alone. He . . .

M: Well, John [Dad], this seems different. The counselor says that Jimmy's doing funny things like making noises and grunts and funny faces. Maybe that's why the kids don't like him. I know you like to be alone, too. But this is different.

D: He doesn't do that at home. At home he seems happy . . . he likes to read a lot and spend a lot of time in his room. I think he just prefers being alone.

T: Well, it sounds like the two of you might be seeing the problem a little differently. Let's come back to that later. Jimmy, tell me about your friends in school.

J: I have one . . . some kid named Eddie. That's it.

T: What do you like to do together?

J: Nothing in particular, not very much.

T: Tell me what you do at recess.

J: Go over and find a spot to sit down or just walk around by myself. Eddie usually plays with someone else.

T: So you'd rather be alone at recess.

J: Sort of.

T: How do you feel when you are around other boys and girls?

J: Well . . . not too good.

T: I'm not sure what you mean.

J: Well . . . not so hot.

T: Not so hot?

J: Well, I just don't feel too good around them . . . sort of like I'd rather not be with them. They make me nervous.

T: How long have you felt this way?

J: Ever since I started middle school [which was about seven months ago].

T: So there's something about being in middle school that . . .

J: Uh huh.

T: Mom and Dad, how do you see this? When did you first start to notice that Jimmy preferred to be alone?

M: Well . . . we thought everything was going pretty well at first. But then again, he never has been particularly outgoing personally. He has always been kind of a loner . . . maybe one friend or two, ever since he was little.

J: I did have one real good friend. His name was Patrick. I don't see him any more. He doesn't go to middle school.

T: It sounds like you miss him.

J: Yeah, he flunked fifth grade.

T: That's hard to lose a best friend. You probably did some neat things together.

J: Yeah.

D: What do you think, Doctor? Is Jimmy normal? Maybe he just misses his friend. He's a lot like me.

T: Certainly, a number of things are going on with Jimmy at this time. It's difficult for him to go to the new school and meet new friends. Also, he lost his best friend.

[This discussion continues for the next several minutes.]

*T:* Let's move on to how things are going in school. I understand that Jimmy has got sick at school. Tell me about that.

*M:* The school calls us because Jimmy got upset and his stomach started to hurt. I'm sure it hurt a great deal . . . those situations can really get you going. [Jimmy's mother briefly describes her own school fears in the seventh grade.]

*J:* Hey, Mom, how about the time, the first time. Remember? The first time I was in the clinic?

*M:* I don't remember that.

*J:* Yes you do. It was in September, September third.

*M:* Did Daddy come and get you that day?

*J:* You both came.

*D:* That's right. I was home from work that day.

*J:* Do you remember what happened that night?

*M:* No, I don't. Do you, John?

*D:* No . . . I can't remember.

*J:* You don't remember when we came back from the grocery store and we heard explosions?

*T:* Jimmy, tell us what happened.

*J:* Well, uh . . . on our way home we heard these explosions and . . . uh . . . when we got home . . . uh . . . I went right into my room to check to see if my hamster was alright and . . . uh . . . I did something she wouldn't usually allow me to do. Pull her out by her tail. And . . . uh . . . I thought she had gone into hibernation and I went into the living room and showed her to Dad and he said she'd been dead for 30 seconds. [Jimmy appears very nervous, moving restlessly in his chair, stammering, and clutching his hands together.]

*T:* Tell us more about that.

*J:* I reached into where she usually slept and . . . uh . . . she . . . uh . . . and I poked at her and she didn't wake up. So I pulled her out by her tail and I didn't see her breathing.

*T:* Jimmy, picture that happening now. Can you imagine it?

*J:* Yeah.

*J:* Yeah.

*T:* How does it make you feel?

*J:* Just like the day at school . . . I was afraid . . . I started to cry. I didn't know what happened.

*T:* Picture her now. What color was your hamster?

*J:* She was golden . . . I really liked her a lot . . . she was my best friend. [This dialogue continues for several minutes with Jimmy vividly describing this event in detail.]

*T:* Well, Jimmy, it's certainly understandable that you were upset that night. You had trouble at school, you heard the loud noises, and your favorite pet died. After that, your problems in school seemed to get worse. Is that right?

*J:* Yeah. It was like I didn't know what would happen next. I worry a lot. School makes me upset. I don't like to play with the other kids. Sometimes the teachers call on me, too. I don't like that. The kids laugh at me. [At this point, Jimmy starts to cry in the session. His mother offers him a Kleenex, and his father puts his hand on his shoulder.]

*T:* Well, Jimmy, you have shared a lot about yourself today. That's good. Sometimes, things seem pretty scary to you, and you are not sure what will happen next.

[The remainder of the first session is spent clarifying the presenting concerns and at-

tempting to isolate the antecedent and consequent events associated with them. The session ends with the therapist developing a contract with the family for further assessment and treatment.]

T: Well, we'll have to end our session today. I'm confident that we'll be able to assist you. Of course, a lot will depend on each of you and how hard each of you is willing to work. We'll need to do the following things. First, I would like you, Jimmy, to fill out these two forms [Spielberger State Trait Anxiety Inventory and the Children's Fear Survey Schedule—Revised]. These will tell me a little more about how you feel and the situations in which you feel that way. Second, I would like you, Mom and Dad, to complete this rating form together [Achenbach's Child Behavior Checklist] about Jimmy and his behavior. Third, I will be visiting the school to talk to your guidance counselor and your teachers, and to talk with you in school about how things are going. Fourth, I will have Jimmy record some things about his own behavior, and I will have you, Mom and Dad, record some things about your behavior also. We'll pinpoint these in our next session. Finally, in our next session, I'll review these forms with you and obtain more information, and then we'll map out a course of action. It's hard to tell exactly how long we'll be meeting, but it will probably be about ten weeks. We'll meet once each week for about an hour. Do you have any questions about how we'll proceed or what will be involved? As we proceed, please feel free to make suggestions and to keep me informed about how things are going.

Well, this has been a good session, especially for you, Jimmy. You seem as if you really want to work on improving things. And Mom and Dad also want to help. That's good and a great start! OK. Let's stop for today.

As a result of this first session, Jimmy's problems were conceptualized as anxiety-related. In the session, he appeared highly anxious, fearful, and apprehensive. He seemed preoccupied with past events (e.g., his hamster's death and the loud noises), overly concerned about being evaluated (e.g., the other students' making fun of him), in need of excessive reassurance (e.g., "What will happen to me?"), and worried about future events. Furthermore, a variety of somatic complaints was evident (e.g., headaches and stomachaches), and he seemed unable to relax in the session (e.g., moving about in the chair and folding and unfolding his hands). This "picture" is most consistent with the more generalized overanxious disorder of childhood, although it should be noted that characteristics of separation anxiety (e.g., losing his best friend and his hamster, as well as his dependency on mother), avoidant disorder (e.g., entering a new social situation), and phobic disorder (e.g., fear of school) were also present. Such a picture reflects the typical scenario that we encounter. The children we see do not fit nicely into simple or straightforward diagnostic categories. Nonetheless, Jimmy was anxious and fearful and clearly fit the more empirical classification of anxiety disorders described by Achenbach and others.

In the second session, the rating forms were reviewed and discussed with Jimmy and his parents separately. For the first part of the session, Jimmy was seen. On the State-Trait Anxiety Inventory for Children, Jimmy reported excessive anxiety on nearly every item on the Trait Scale (16 of the 20 items were marked "often"). For example, he reported "often" to the following items: "I worry about making mistakes," "I worry about things that may happen," "I get a funny feeling in my stomach," "I worry about school," and "I am secretly



afraid." These scores placed him well above the normative sample and clearly in the anxious range (Spielberger, 1973). Similarly, on the State Scale, Jimmy reported that he felt "very nervous," "very scared," "very frightened," "very mixed-up," and "not relaxed." Again, Jimmy's scores placed him in the highly anxious range. For the State Scale, he was asked to describe how he felt, *at this very moment*, about himself and his school problems. Finally, on the Children's Fear Survey Schedule—Revised (Ollendick, 1983b), Jimmy reported a multitude of fears that were related primarily to the social-evaluative factor (e.g., "giving an oral report," "looking foolish," "meeting someone for the first time," "being called on by the teacher," "having to go to school," "making mistakes," and "taking a test). Other excessive fears were less evident, although his total fear score was more than 1.5 standard deviation (SD) units above the normative sample. Clearly, he reported himself as being fearful in situations similar to those indicated on the anxiety questionnaires.

In the second part of the session, the Child Behavior Checklist (Achenbach, 1978) was reviewed with Jimmy's parents. Although the parents had some difficulty agreeing on specific items, they reported that his involvement in activities, social organizations, and school was minimal. Thus, his social competency score was rated at about the fifth percentile—clearly, well below that of Achenbach's normative sample. In addition, his parents agreed that it was "often true" that Jimmy was "anxious," "nervous," and "shy"; that he "fears school" and "clings to adults"; and that he has "stomach problems," "pains," and headaches." Although these individual items are drawn from various factors on the Achenbach profile, they all represent "internalizing" problems of an anxiety dimension.

In the last part of the second session, Jimmy shared his self-report results with his parents, who reported to Jimmy how they perceived him. The therapist mediated this discussion, encouraged the participants, and socially reinforced them for their efforts. By the end of the session, it was agreed that relaxation training would be initiated for Jimmy in the next session, that Jimmy would self-monitor the number of days he went to school and the number of times he was able to respond accurately when called on by his teachers (he was provided a handy index card for this purpose), and that the parents would self-monitor the amount of time each of them spent daily with Jimmy. This latter monitoring was initiated because one of the treatment goals was to increase the father's time spent with Jimmy and to indirectly reduce the amount of his solitary time. During the interval between the second and third sessions, the therapist was to visit the school, devise a behavioral observation system, and involve the school in Jimmy's treatment program.

At school, two teachers were recruited to assist in programming. One teacher had Jimmy in daily morning mathematics classes, and the other had him in daily afternoon reading classes. Both teachers shared "recess" duties on alternate days. These teachers were selected because of their interest in Jimmy. Representative samples of his behavior could thus be obtained during mornings and afternoons, as well as during structured (class) and unstructured (recess) activities. The teachers unobtrusively recorded the number of times each called

on him in class (they were instructed to call on him at least twice daily) and the number of recesses (20 minutes in length) during which he played with at least one other child. This latter assessment was intended to be a measure of generalization of treatment efficacy, resulting from reduced anxiety in social-evaluation situations. At this visit, the counselor also discussed Jimmy's grades and reported that he had missed an average of 2½ days of school per week over the past month. She was asked to keep a record of his attendance and to report it weekly to the therapist. It was decided not to record the number of "weird" or "strange" behaviors in school because of difficulties in operationalizing exactly what the teachers meant by these labels and because the treatment program was designed to reinforce positive behaviors and to ignore others.

In summary, the following measures were collected and reviewed during each successive session: (1) the State Scale of the State-Trait Anxiety Inventory; (2) Jimmy's self-monitoring of school attendance and the number of times he was able to respond accurately when called on by teachers in each class; (3) a recording of the number of times Jimmy responded accurately in class by the two representative teachers and the number of recesses during which he played with at least one other child; (4) the counselor's recording of school attendance and grades; and (5) the parents' recording of time spent individually with Jimmy at home.

At the third session, it was revealed that (1) Jimmy's self-report of state anxiety remained high; (2) Jimmy had recorded that he went to school 3½ days and that he was able to answer the teacher correctly only twice, although he had been called on nine times by the mathematics teacher and five times by the reading teacher during that week; (3) the mathematics teacher recorded only one time that Jimmy answered correctly, whereas the reading teacher recorded none, and neither teacher had observed Jimmy playing with another child during the three recesses for which he was present that week; (4) the counselor recorded 3½ days of school attendance; and (5) the mother reported that she had spent an average of 62 minutes with Jimmy daily, whereas the father reported an average of only 7 minutes (these times were recorded between 5:00 P.M. and 7:30 P.M. nightly). As is evident, acceptable reliability was present for those measures on which it was feasible to obtain such checks.

The treatment was multifaceted and included deep-muscle relaxation and parent-child contracting spread over nine treatment sessions. Overall, Jimmy's response to this treatment regimen was positive. Furthermore, multiple sources of assessment allowed us to determine the significance of change from Jimmy's own perspective as well as from that of his parents and teachers. Finally, these reports of change were confirmed by actual behavioral change in the home and school settings. Although we cannot claim or illustrate this degree of success with all of our anxious clients (unfortunately), this case study highlights the diverse assessment and treatment procedures that are potentially useful in the outpatient treatment of anxious children. Whether all of these strategies were necessary is, of course, unknown. Each strategy, however, was used in an attempt to address "specific" areas uncovered through assessment. Although significant change may have occurred in the absence of such comprehensive

assessment and integrated treatment, our clinical efforts have been guided by a philosophy that suggests that we provide our clients thorough as well as expedient clinical treatment. The diminished experimental rigor and finesse evident in such applications are typical of such interventions when applied in clinical settings (Ollendick & Cerny, 1981).

## SUMMARY

Anxiety in children has been described by the terms *fear*, *anxiety*, and *phobia*. Although there are subtle differences among these terms, their similarities are more striking. Distinctions have been made generally on the basis of the nature of the provoking stimuli. Such distinctions are often difficult to grasp. It has been suggested that more meaningful distinctions might be made on the basis of persistence, magnitude, and maladaptiveness (e.g., Barrios *et al.*, 1981; Miller *et al.*, 1974).

Childhood anxiety-based disorders have been classified on both empirical and nosological bases. The DSM-III is an example of a nosological approach that proposes three distinct anxiety disorders of childhood: separation anxiety disorder, avoidant disorder, and overanxious disorder. In addition, the DSM-III recognizes that children may present with phobic disorders but provides no separate diagnosis for childhood phobias.

Empirical methods have identified childhood anxiety as part of a broadband internalizing or overcontrolled dimension (e.g., Achenbach & Edelbrock, 1978; Ross, 1980). This broadband dimension has been found consistently in multivariate studies and consists primarily of anxiety, depression, and social withdrawal.

Each classification approach has benefits and limitations. Although nosological approaches provide clinically meaningful distinctions, more research is needed on the reliability and validity of the DSM-III childhood-anxiety-disorder diagnoses. In contrast, although empirical approaches provide reliable and valid dimensions, these dimensions are quite broad and offer little information regarding distinctions within dimensions. The answer may lie in combining the best of the nosological and empirical approaches. In fact, Achenbach's work (1985) suggests that empirical and nosological approaches can be combined, as he has identified narrower-band empirical dimensions that are similar to DSM-III diagnostic categories.

Normative and developmental considerations are extremely important to the study of any childhood disorder. Such considerations are particularly important in regard to childhood anxiety disorders. At present, research suggests that normal children report a relatively large number of fears and worries (e.g., Jersild & Holmes, 1935; Lapouse & Monk, 1959; MacFarlane *et al.*, 1954), and that the number of reported fears tends to decline with age (Graziano & DeGiovanni, 1979). In addition, we know that the content of children's fears changes with age in correspondence to changing cognitive capacities (Morris & Kratochwill, 1983). Such information can guide the assessment and treatment of anxious children.

Future research is warranted in this area. A productive area of inquiry might be to determine children's understanding of fear and anxiety at different developmental levels. For example, what does a child mean when he or she says that he or she is afraid of fire? Is the child worried that a fire might occur? Does the child mean that he or she would be afraid if he or she were actually in a fire? Does this meaning change with age? These are important empirical questions.

Finally, we provided an overview of the available assessment techniques for childhood anxiety. Such techniques included behavioral interviewing, behavioral observations, and various self-report, other-report, and physiological measures. Particularly promising is the development of specific behavioral observation schemes (e.g., POSA) and cognitive self-statement measures (e.g., CCAQ) of childhood anxiety. The key to understanding and treating anxious children is a comprehensive assessment. Comprehensive assessment allows one to make differential diagnoses and provides measures of treatment outcome. The benefits of such a comprehensive assessment procedure were highlighted in a case study.

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# 16 Selected Chronic Physiological Disorders I

## General Assessment, Asthma, Tics

RONALD NEEPER AND ANTHONY IEZZI

The intent of this review is to supply the reader, assumed to be a behavioral clinician, an overview of the assessment of selected physical disorders and their associated behavioral sequelae. We begin with a brief historical overview of the area to provide the reader with a basic conceptual foundation. Following the historical overview, a general assessment paradigm is presented. The individual disorders are presented next, along with specific assessment and diagnostic issues associated with each.

### HISTORICAL OVERVIEW

Since antiquity people have been interested in the interaction between the mind, or psyche, and the body. In particular, much thought has been devoted to questioning how mind and body interact in disease processes. With the advent of modern psychiatry and psychology, the theorizing and research in this area have intensified, culminating in a voluminous literature. However, the sheer volume of writing has not yielded clarity, in that many theoretical as well as applied questions remain to be answered.

The early scientific work in this area was conducted primarily by psychoanalytically oriented investigators, who emphasized a dualistic mind–body position. It was out of this psychoanalytic orientation to the field that terms such as *psychosomatic* were coined to apply to physical disorders and symptomatology that were presumed to have an intrapsychic etiology. Initially, the psychoanalysts focused primarily on uncovering specific intrapsychic conflicts that resulted in the physical symptomatology. Asthmatic wheezing might be viewed as muted cries for mothering (French & Alexander, 1941). A tic could be a sign of erotic expression (Ferenczi, 1921) or displaced hostility (Fenichel, 1945).

When the intrapsychic conflict approach became less popular psycho-

analytic theorists shifted interest to discovering particular personality types that were associated with individual psychosomatic disorders (Werry, 1979). For example, asthmatic children have been reputed to possess an immature and anxious-dependent character type (Herbert, 1965). An approach that is perhaps the obverse views many psychosomatic disorders as an ultimate manifestation of a characterological problem. Thus, several investigators have focused on the prevailing belief that chronic illness places one at high risk for characterological and/or emotional difficulties. Although some present findings indicate that chronically ill children do, in fact, experience higher levels of psychopathology (Kashani, Barbers, & Bolander, 1981; Pless & Roghmann, 1971), others have found this not to be the case (Tavormina, Kastner, Slater, & Watt, 1976). This area of research may at best be considered inconclusive.

In sum, we should point out a commonality between the intrapsychic-conflict and the personality-type approaches to the study of psychosomatic disorders. Both the intrapsychic-conflict and the personality-type approaches are based on the premise that a *specific* psychological factor results in a *specific* disorder or symptom pattern (specific theories; Werry, 1979).

In contrast to the specific theories, more recent approaches have concerned themselves with stress and physiological responding in a general sense (non-specific theories; Werry, 1979). Following what Minuchin, Baker, Rosnan, Lieberman, Milman, and Todd (1975) labeled the "linear model," nonspecific theorists have emphasized the link between stress, emotional responding, and physical illness. Stress results in emotional responding, which, in turn, is accompanied by autonomic arousal. Autonomic arousal or overactivity is proposed to wear down predisposed organ systems or "weak links," and the result is either actual physical damage (e.g., ulcers) or pathophysiological responding (e.g., migraine headache).

One type of research that this orientation to psychosomatic disorders has spawned is focused on comparing the number of stressful life events experienced by ill children and healthy controls. Many investigators have found that psychosomatically ill children have experienced significantly more stressful life events than their healthy peers (Coddington, 1972; Heisel, Ream, Raitz, Rappaport, & Coddington, 1973). In general, these investigators have proposed that the stress associated with significant life events contribute substantially to the etiology of the psychosomatic illness and to the exacerbation of other types of illnesses. This model fails, however, to explain how some low-stress children develop psychosomatic illnesses, as well as how many apparently high-stress children remain healthy (Melamed & Johnson, 1981).

Traditionally, children presenting with physical symptomatology have been given medical evaluation as a first priority. If the medical tests prove negative, it has been the trend to refer the child for psychological consultation (most often psychodynamically oriented), as the problem has been presumed to be psychological (Kenny, Bergey, & Young-Hyman, 1983). More recently, with the increased popularity of the linear model (stress → emotionality → pathophysiology), many have conceptualized psychosomatic disorders as lying along a continuum. At one end lie disorders that have primarily a psychological



etiology (e.g., conversion reactions), and at the opposite end, disorders that have primarily a physiological etiology (e.g., ulcerative colitis; Kenny *et al.*, 1983).

Several authors have taken issue with the linear-continuum definition of psychosomatic disorders (Werry, 1979; Wright, 1977). Werry (1979) noted that, despite a lack of hard medical reasons for the presence of the physical symptomatology in some cases, we cannot automatically assume that the etiology is nonorganic. We are limited in our ability to detect organic dysfunction by existing medical technology. Along with advances in medical technology, disorders previously thought to be entirely psychological in nature are now believed to develop because of organic etiologies (Werry, 1979). Asthma is perhaps the prime example. Before the current sophistication of the allergic and immunological sciences, asthma was believed to be entirely a psychological phenomenon (Werry, 1979). Asthma is now believed to have an organic etiology (Sirota, 1982), but a course that may be mediated by psychological factors.

Another critique of the continuum model of psychosomatic illness is based on advances in the current taxonomy of psychiatric disorders. Psychosomatic disorders such as conversion reactions, heretofore believed to have an entirely psychogenic origin, are no longer regarded as psychosomatic disorders in current diagnostic schemes such as ICD-9 and DSM-III (Werry, 1979).

Wright (1977) specifically took issue with the linear model definition of psychosomatic disorders:

The concept of psychosomatic illnesses as problems resulting from emotional stress is questioned as one that may have outlived its usefulness. . . . The field of psychosomatic medicine suffers from definitions and concepts that have emerged, over time, without adequate forethought and structure necessary to remove ambiguity and ensure that the field is properly delineated. (p. 625)

In his review, Wright noted that the linear model has never fully accounted for the many types of psychosomatic disorders that have now been identified. It should also be noted that, as discussed earlier, the linear stress model does not explain how some low-stress individuals get sick and how many high-stress children remain resilient and healthy.

Wright (1977) took a broad-based and seemingly categorical position in defining psychosomaticism. He included all "behavioral concomitants" associated with physical illness in his conceptualization of the term psychosomatic. Four general classes of psycho-behavioral concomitants were proposed by Wright. First, organic problems may be the result of dysfunctions of learning or development (Wright, 1977). For example, the origin of encopresis in children often begins in a period when the child intentionally retains feces. It is assumed that this behavior is in some way maintained by environmental contingencies. During this retention period, the child's colon becomes stretched. At this point, the neurological defecation reflexes require an increasing bulk of feces to trigger defecation. Even if the original contingencies initiating the retention behavior are no longer in effect, the child continues to have the problem of encopresis. A similar example illustrated by Wright is tracheotomy addiction in the young child. Wright noted that, because of a developmental learning phenomenon,

very young children who have breathed using a cannula fail to develop or to learn normal breathing behavior using the mouth and nose. Hence, on removal of the cannula, the child is apparently unable to breath.

Wright also proposed a class of organic problems that are the result of problems of personality and character development, for example, the non-compliant child who refuses medication. Character also influences how one handles stress. Cognitive behaviorists have demonstrated that how one interprets life events cognitively plays an important role in the emotional or autonomic responses that one eventually experiences (Beck, 1977; Ellis & Harper, 1975). It follows, then, that the character variable of cognitive style may play an important role in how life events or stress become psychological factors that mediate the expression of physical symptomatology.

The final two classes of psychosomatic phenomena outlined by Wright cover how physical illness may influence psychological functioning; thus, they are complementary to the initial two psychosomatic classes reviewed. Wright noted that organic illness may effect the psychological function of children both directly and indirectly. Chronic illness can place many limitations and burdens on children and their families. Therefore, indirectly, the problems in living associated with having a chronic illness may affect emotional functioning in an adverse way by forcing the child and his or her family to adjust to the situation. Chronic illness may cause psychological disturbance directly as well. Should the illness involve the brain or the endocrine system for example, direct emotional, intellectual, and behavioral manifestations are possible.

The conceptual system provided by Wright (1977) gives an outline for the interplay between psychological phenomena and organic disease. The Wright schema is comprehensive, going beyond the simplistic, linear stress model. Thus, it has considerable merit. It is important, nevertheless, to be aware that the schema does make inferences about psychological etiology. These inferences may go beyond our current medical and behavioral technological ability to explain the etiologies of many disorders (Russo & Varni, 1982; Werry, 1979).

Within recent years, there has been a dramatic increase in the number of behaviorally oriented clinicians involved with physicians in the treatment of pediatric medical problems (Russo & Varni, 1982). Like Wright, these investigators have regarded any psychological or behavioral problem occurring concomitantly with a medical disorder as an appropriate target for intervention. However, they have not devoted any effort to the categorization of various psychosomatic problems *per se*, as did Wright, but view the various medically associated behavioral problems as deficits in learning occurring within the context of a chronic illness (Russo & Varni, 1982). Additionally, the behaviorally oriented approach tends to make fewer inferences regarding etiology. One would not often encounter etiological terms such as *psychosomatic* in the behavioral literature. Instead, behaviorists place emphasis on the empirical development of assessment and treatment techniques based on social learning principles (Russo & Varni, 1982). The stress placed on empiricism in the behavioral approach is perhaps its hallmark. Russo and Varni (1982) summed up the behavioral position succinctly:

What behavioral medicine and behavioral pediatrics offer lies in their focus on learning and teaching, their emphasis on skills training rather than the etiology of skills deficits, and their empirical assessment of treatment process and outcome. (p. 11)

In summary, our conceptual scheme regarding the psychological or behavioral phenomena associated with physical symptomatology has changed dramatically over the past several years. Initially, clinicians viewed many medical conditions (e.g., asthma) as manifestations of intrapsychic conflict. An additional implicit assumption associated with this viewpoint was that chronically ill children were almost always believed to be deviant psychologically. The most recent or behavioral position, however, is grounded in a scientific approach emphasizing the learning of behavioral deficits in the context of a chronic illness or other difficult life situations (Russo & Varni, 1982). These deficits may be manifested at the cognitive, overt behavioral, and/or physiological level. Within the behavioral position, it is not automatically assumed that the child with a chronic medical problem is psychologically deviant. Instead, it is believed that the child that is learning behavior that is a normal response to the context he or she is in (Russo & Varni, 1982).

Fortunately, along with the conceptual shifts in this area have come technological advances not only in the medical sciences but in the behavioral sciences. Although we still remain in a quandary regarding causal relationships between physical symptomatology and associated behavioral problems, we can remain optimistic that continued reliance on empirical methodology will further clarify these issues (Russo & Varni, 1982).

## A GENERAL ASSESSMENT PARADIGM

Now that we have presented a brief review of the history of the area, it is the responsibility of this review to provide assessment and diagnostic guidelines for behavioral clinicians dealing with medical disorders in children. A selected group of disorders was chosen for illustration.

Although various medical disorders are covered in this review, we recommend a common assessment paradigm. It is presented initially, and the deviations, obviously required for the individual disorders, are later presented along with the individual illnesses.

We recommend a model that integrates a neo-Kraepelinian (Blashfield, 1984) diagnostic approach with a behavioral functional-analytic approach. Although these two views may seem incompatible, the common denominator integrating them is a reliance on empirical data for support. A similar outline for a general assessment paradigm was provided by Wright (1978).

While conducting the assessment process, inquiry should follow a number of general trends across the various problem categories to be assessed (Wright, 1978). The clinician must always be aware that judgments regarding the degree and type of psychological or behavioral involvement in the various somatic problem areas are the primary focus of the assessment process. Therefore, it becomes vital to adapt a behavior-analytic approach to each line of questioning.

When the various medical symptoms (psychiatric symptoms as well) are viewed as the behavior of focus, it is important to uncover events that have occurred before the exacerbation or development of the disorder, that is, the antecedents. Equally important to consider are the events that have followed the display of symptomatology. Does Mary fight with her parents before her asthma attacks? Do they give in to her demands and infantilize her afterward? Does the entire family panic at Mary's attacks? The functional-analytic approach may be applied to nonpsychological phenomena as well (e.g., "Does Johnny's ulcer flare up after spicy food?").

Related to the concept of functional analysis is the important focus of maintaining a historical perspective throughout the interview (Wright, 1978). When did the problem develop? In other words, is the problem acute or chronic? Has the course been steady or variable? Similarly, the clinician should consistently attempt to relate associated problems and antecedent events along the time line created by adapting a historical approach. The benefits of a temporal outlining of the various problems are obvious. A good picture of general antecedents and consequential events often results, yielding many insights regarding possible targets for remediation. In addition, the structure afforded by the historical approach can aid in organizing and making sense of what can often be an insurmountable amount of information on a client. Finally, time considerations often come into play in the differential diagnosis of many disorders. Some disorders are extremely rare before certain ages (e.g., headache). Similarly, some psychiatric diagnoses require symptomatology of a certain severity over a prescribed period of time (e.g., depression).

Also of importance in the general assessment procedure is the degree of circumscription of the various problems (Wright, 1978). Behaviorists have recognized the importance of a situational analysis regarding the occurrence of problem behavior. Nevertheless, if one problem behavior occurs in a given situation, the clinician would also expect other related behaviors to occur (Kazdin, 1982). For example, if a child talks back to a teacher, we might also expect that child to bully peers, and to lie and cheat. In a similar vein, specific kinds of behavior problems often have effects on the child's functioning in other areas, thus having a more pervasive influence on the child's life. If Johnny shows aggressive behavior and is disruptive in class as well, he may also be disliked by his peers and experience academic problems resulting from not attending to his schoolwork. Similar parallels may also be drawn from physical problems. Wright (1978) pointed out that physical symptomatology may be highly circumscribed in children. For example, a child may have problems in urinary continence and no other definable troubles. In contrast, however, a child may present with a whole host of somatic complaints that dramatically interfere with social, intellectual, and many other aspects of psychological functioning. In short, the clinician must be careful to avoid the pitfall of identifying a single problem and treating it in a circumscribed manner.

Often, the impact that a somatic problem has on a given child is related to its severity, a final dimension to be considered in the general guidelines for a diagnostic assessment (Wright, 1978). Ostensibly, more severe disorders should

result in greater demands on adjustment and, hence, put a child at greater risk for psychopathology. This idea has received support within the literature (Pless & Roghmann, 1971).

### *The Assessment Process*

The semistructured interview, conducted with the child's parents, constitutes the core of the assessment process. From it one can obtain a broad perspective of the child's and the family's current functioning. Other more specific and objective techniques or measures may be selected based on the initial information obtained in the parental interview. Similarly, information yielded in the parental interview may provide a guide for subsequent interviews with the child.

So far as objective measures are concerned, the behavioral assessment literature provides us with an armament of tools (Mash & Terdal, 1981). Generally included in these would be parent and teacher questionnaires, child self-report questionnaires, psychophysiological measures, and observational and self-monitoring techniques. Combined, these measures provide data from the cognitive, overt behavioral, and physiological spheres that constitute the tripartite assessment—a hallmark of the behavioral orientation. Projective techniques are not generally recommended because of their well-noted problems in reliability and validity (Gittelman-Klein, 1978).

Initially, it is best to begin the interview of the parents by permitting them to voice in their own words the specific medical and or behavioral concerns they have about their child. This approach provides a very general overview of the problem and yields information regarding the parents' priorities insofar as change is concerned. Diagnostic considerations provide a structure for inquiry into psychological and other areas of functioning. It is recommended that psychiatric diagnostic categories, medical history, developmental history, and family history be covered, one at a time. The order of coverage is not important; however, it is generally best to begin structured coverage of the various categories with an area that the parents have presented initially as a concern.

A number of categories of childhood psychological problems deserve specific consideration. Attentional deficits are a frequent problem in children and represent a major psychiatric diagnostic category (American Psychiatric Association [APA], 1980). Children with attentional deficits may show problems in impulsive behavior, immaturity, and clumsiness. They may be either hyperactive or hypoactive motorically. Careful assessment of attention deficits should take into account the situational specificity of the attentional deficits in many children. For example, does Johnny attend to his favorite TV shows for hours, whereas he is able to focus on his schoolwork for only short periods of time? One should also note and make judgment about whether attentional problems are a primary problem (in other words, a central deficit) or are secondary to other medical (e.g., medication) or psychological phenomena (Levine & Melmed, 1982).

Disorders of conduct constitute a second category of psychological prob-

lems, one that often occurs simultaneously with attentional deficits. Behaviors such as stealing, lying, swearing, fire setting, and oppositional behavior represent some core features of this behavioral spectrum. Two additional distinctions are important to make in this category as well. One distinction is whether the child is aggressive either verbally, physically, or both. Second, some children engage in the aberrant behavior primarily while in the company of deviant peers, whereas other children do not involve themselves with a deviant peer group. Thus, in current conceptualizations (APA, 1980), these children may be divided into four general groups: undersocialized aggressive, socialized aggressive, undersocialized nonaggressive, and socialized nonaggressive.

Traditionally, of all the major childhood psychiatric diagnostic categories, anxiety disorders and depression have perhaps been the ones associated most often with physical problems. This finding is in accord with the linear stress model of psychosomatic problems. For this reason, comprehensive coverage of these potential problems is imperative. It is always a good idea to inquire about general signs of anxiety, such as trembling, sweating, shaking, and avoidance behavior. Somatic complaints such as headache and abdominal pain often are present with anxiety and affective disorders, posing an issue of differential diagnosis between bonafide physiological disorders and associated symptoms of anxiety or depression. Specific fears or phobias are relatively common in children and should be carefully evaluated. Social and school phobias, as well as animal and other simple phobias, are the types most frequently seen in children (APA, 1980).

Additionally, issues related to secondary gain and the negative reinforcement of avoidance behavior should be addressed. Obsessive worrying and compulsive behaviors also merit inquiry. Often, in the assessment of affective disorder, mood disturbance is assessed, and the diagnosis of depression is made on this basis alone. It is extremely important to assess for neurovegetative signs as well (APA, 1980). Absence of pleasure seeking (anhedonia), sleep disturbance, eating changes, and somatic complaints also need consideration. The occurrence of these signs additionally presents a point at which careful functional analysis and differential diagnosis may need to be conducted, as many of the above-mentioned neurovegetative signs can be the result of medical problems. Obviously, if a child has a history of ulcerative colitis, one should not include abdominal pain as a somatic complain in the diagnosis of an affective disorder. Careful distinctions such as this can often preclude diagnostic confusion.

A final psychiatric category deserves mention. Screening for severe pathology such as hallucinations, delusional thoughts, and other evidence of cognitive disorder is important. As with all of the other categories of maladaptive behavior discussed, this area should not be ignored because of a faulty assumption that, if it were occurring, the parents would bring it up.

Admittedly, we have provided a cursory overview of child psychopathology, based on the assumption that the reader has a working knowledge of the area. For more comprehensive coverage of child psychiatric disorders the reader is referred to Achenbach (1982), DSM-III (APA, 1980), Ollendick and Hersen (1983), Quay and Werry (1979), and other chapters in this volume.

On completion of the psychodiagnostic portion of the interview, several other areas merit assessment. Of course, a thorough assessment of the child's medical history is in order. Again, it is quite useful to approach this portion of the interview by adopting a historical perspective that incorporates a functional analysis of the problems. In addition to the presenting medical problem(s), one should inquire about other potential difficulties. Allergies; genetic problems; seizures; accidents, particularly those involving the head; infections, especially those that have caused a protracted high fever; and feeding or gastrointestinal problems, including periods of obesity, anorexia, pica, or vomiting—all should be screened (Wright, 1978). Prescription medication and illicit drug and alcohol use should be explored as well. Previous medical records should be obtained from the various facilities used by the client. Not only does this collection of records aid in the classification and accuracy of documentation of the various medical problems, but often, this may be the first time in the child's life when all of his or her records have been collected in one place.

Related to the medical area of functioning is developmental history. Possibly, at no better time in the assessment process is one afforded the opportunity to integrate the data obtained into a temporal perspective. Naturally, prenatal events and the birth of the child serve as the starting point in the developmental-history taking. Prenatal assessment entails exploring the mother's medical history before and including pregnancy. Tobacco, alcohol, and drug use need to be queried. Other problems associated with the pregnancy and the delivery may include Rh incompatibility, breech birth, the need for a cesarean or forceps delivery, anoxia in the child, and toxemia in the mother (Wright, 1978). This list is not all-inclusive; therefore, the mother should be questioned further for additional details and problems. Early infant temperament is also useful information.

Achievement of language and motor milestones should be delineated. In particular, dates of first words, first combination of words, early sentences, and the age at which the ability to communicate clearly with others was achieved constitute the most important language milestones. Histories of comprehension and language-expression difficulties, including stuttering, should be carefully noted. Additionally, any delay of a language milestone should be documented.

The dates of the following motoric events are noteworthy: sitting unassisted, crawling, standing both by pulling up and unassisted, first steps, walking unassisted, and running. Any abnormalities in gait or signs of clumsiness should be explored and clarified. Fine-motor functioning involving tasks such as feeding oneself and dressing oneself should be assessed. Various play activities are also important. Atypical motor behavior, such as tics, may be explored at this point as well.

Development of personal hygiene skills and toilet training constitute other important areas of focus. In addition to noting the parent's methods in toilet training, one should record any problems with the actual training, as well as any relapses in either urinary or fecal continence.

Personality and social developmental functioning may be explored at this point or at appropriate points in the psychological portion of the interview.

From information on infant temperament, one can trace further the personality of the child. Various medical and psychological problems can have an impact on the child's social functioning (Wright, 1978). Given that social functioning is related to a host of later adult problems (Hops & Greenwood, 1981), it is indeed deserving of detailed investigation.

An area not discussed so far is school or academic functioning. In addition to areas of social relationships at school, it is important to investigate academic functioning; not only because a comprehensive assessment *per se* is needed, but because chronic illness and psychological problems can result in academic failings (Wright, 1978). Neepner and Lahey (1984) provided a guide for the behavioral assessment of learning problems, as do several chapters in this volume.

Up to this point, our focus has been primarily on the child. Family functioning constitutes our final important area of assessment within the general paradigm proposed here. As the child's psychological, social, school/work, and medical history is assessed, so should be that of the other family members.

Parenting styles and methods of managing child behavior represent an important focus of investigation. Not only is overt parental psychopathology manifested in the parenting style (Forehand & McMahon, 1982), but more molecular assessment of such things as parental attitudes and actual means of discipline deserves attention (Wright, 1978). As Wright (1978) pointed out, the parents are often the agents responsible for the implementation and monitoring of the psychological interventions relating to medical problems, as most often, these interventions are behavioral. Careful assessment of the parents' motivation and ability to carry out this task is indeed merited.

In conclusion, this section of our review proposed an outline for a general assessment paradigm well suited to the diagnostic and behavior-analytic conceptualization of related psychological and medical problems in children. Having presented the assessment process in general, we now move on to describe a selected group of medical and somatic problems and the various issues and techniques related to their assessment.

## ASTHMA

Asthma is most often defined as a disorder of reversible airway obstruction characterized by an intermittent and variable course (Chai, 1975; Creer, 1982, Creer, Renne, & Chai, 1982; Ellis, 1983). Symptoms of asthma may be *reversible* either through treatment or by natural causes. The display of the symptoms is said to be *intermittent* in that a child may go for relatively long periods of time without difficulty, although he or she may also have several attacks in a period of days. The severity of the attacks is *variable* both interindividually and within the same child. A child may experience attacks that amount to nothing more than mild wheezing and, later, may experience severe attacks, referred to as *status asthmaticus*, that are indeed serious as the child could go into respiratory arrest (Chai, 1975; Creer *et al.*, 1982). The majority of children, however, experience only mild asthma (Ellis, 1983).



The airway obstruction that categorizes asthma is the result of a narrowing of the bronchial lumen because of either spasm of the smooth muscle surrounding the lumen, edema (swelling of the epithelial tissue), or excess mucus secretion into the lumen, resulting in mucus plugs (Creer *et al.*, 1982; Melamed & Johnson, 1981). The result is premature closure of the airways, which hinders breathing, particularly expiration. The breathing hindrance therefore both reduces flow volume and rate and results in hyperinflation of the lungs. It should be noted that the airway obstruction is not uniform throughout the lungs but usually affects certain sections (Ellis, 1983).

It is estimated that 5%–10% of school-aged children show some signs of asthma (Ellis, 1983). The onset of the disorder is most often between the ages of 3 and 8 (Melamed & Johnson, 1981), with 80%–90% of the asthmatic children having their first symptoms before the ages of 4–5 (Ellis, 1983). Before puberty, the frequency of males experiencing asthma is approximately twice the number of females. However, the postpubertal sex ratios are roughly equivalent (Ellis, 1983).

Estimates of spontaneous remission rates vary greatly. It has been estimated that anywhere from 22% (Johnstone, 1968) to 74% (Rackemann & Edwards, 1952) of asthma cases remit spontaneously by puberty or shortly thereafter. A previous history of some allergies, such as hayfever, lessens the likelihood of remission (Johnstone, 1968). Generally, a better prognosis is associated with milder cases and earlier onset, excepting onset before the age of 2 (Creer *et al.*, 1982; Slavin, 1977). Maturation of the immunological and metabolic functions, as well as growth and widening of the airways, is believed to be an important factor in the spontaneous remission of asthma (Ellis, 1983).

Asthma is responsible for a large percentage of the visits to physicians and emergency rooms by children. It is, indeed, a very expensive disorder, costing billions of dollars annually (Creer, 1979). Other morbid features of asthma include restriction, inactivity, and high rates of periodic absenteeism from school (Creer, 1979). It is estimated that asthma results in 25% of the school days lost to chronic disease (Melamed & Johnson, 1981).

To date, the etiology of asthma has not become entirely clear, although contrary to the early theoretical propositions, it is now believed to have a medical etiology (Sirota, 1982; Werry, 1979). Asthma runs in families in a manner consistent with polygenetic inheritance (Ellis, 1983). The asthma symptoms are believed to be the result of parasympathetic overreactivity, specifically from the vagus nerve (Chai, 1975; Purcell & Weiss, 1970). Criepp (1976) proposed a defect in the adenylate cyclase system, which plays an important role in the intracellular regulation of stimulation received by the cell. Specifically, Criepp proposed that the adenylate cyclase system is inefficient in responding to sympathetic stimulation; hence, parasympathetic stimulation dominates.

Asthma attacks may be elicited by various factors. Allergens (e.g., ragweed) may promote asthmatic attacks in children. Chai (1975) noted that challenges involving exposure to various allergens believed to be important in eliciting a child's asthma are very important in confirming the diagnosis. Following exposure to the various allergens, antibodies (in particular, the IgE type) are as-

sessed for in the child's blood. Aspirin and similar compounds may also trigger asthma attacks in some children. Again, challenges are necessary to confirm this diagnosis (Creer *et al.*, 1982).

In many children, infections may provoke asthma symptoms or attacks. In particular, it seems that viral agents are important triggers, and that bacterial agents rarely initiate attacks. Cold and flu viruses are of particular importance here (Chai, 1984). Infections are more likely to induce protracted periods of attacks that are gradual in onset (Ellis, 1983).

As we've noted several times throughout this review, asthma was once presumed to have a psychological or emotional etiology. Currently, it is believed that it is not the emotion *per se*, but the behaviors associated with emotional arousal, such as laughing, crying, and screaming, that may trigger asthma attacks, most likely through vagal stimulation (Chai, 1975; Creer *et al.*, 1982; Purcell & Weiss, 1970). No carefully controlled study has yet identified a case of asthma induced only by emotional factors in the absence of physical triggers (Creer *et al.*, 1982). Emotions (e.g., panic) not only may be antecedents and concomitant aggravators of an attack but may be secondary reactions to the attacks (e.g., postattack dysphoria; Sirota, 1982).

Exercise may induce bronchial obstruction in asthmatics as well. Vagal stimulation parasympathetically and airway cooling are the most likely causes in these cases (Creer *et al.*, 1982).

A final category of asthma inducers are referred to generally as irritants. Examples include smoke, perfume, and paint. Irritants are most likely to induce acute attacks (Ellis, 1983). All asthmatic children are responsive to specific irritants (Creer *et al.*, 1982). As with allergens, challenges are of particular importance in confirming the diagnosis (Chai, 1974).

Creer *et al.*, 1982) listed several behaviors and behavior patterns that may occur before the onset of an asthma attack. Physical changes may include facial swelling accompanied by redness, flaring nostrils, a bluish tint to some areas of the face, and voice changes. Behaviorally, the child may become moody or irritable or may become quieted. Asthma attacks most often begin with wheezing and a tight-sounding, unproductive cough (Creer *et al.*, 1982; Ellis, 1983). It is important to point out, however, that wheezing is not diagnostically specific to asthma, nor is it universally reported in asthma attacks (Creer *et al.*, 1982). As the attack continues, the child may report tension or tightness in the chest due to lung hyperinflation. Breathing becomes more labored, requiring use of the accessory muscles to maintain airflow. Children's breathing at this point is often shallow and rapid (Creer *et al.*, 1982; Ellis, 1983). Tachypnea, dyspnea, and tachycardia may occur. As the effort required to breath increases or remains difficult over time, the child may report fatigue and abdominal pain (Ellis, 1983).

In extreme distress, wheezing may not be heard, as insufficient air circulation is occurring to produce the sounds. At this point, the child may begin to panic, either by becoming very emotional and acting disruptively or by freezing, remaining in a silent immobilized state (Creer, 1979). In this severe state the child may also sit up, leaning forward with his or her arms stretched forward and shoulders hunched, a position that makes it easier to breath (Creer *et al.*,

1982; Ellis, 1983). If the child fails to respond to sympathomimetic drugs or theophylline at this point, the diagnosis of status asthmaticus is often given (Ellis, 1983). Further unresponsiveness to treatment such as adrenergics or corticosteroids places the child at greater risk, as the oxygen level may become low and the pH of the blood may become too acidic (Chai & Newcomb, 1973). Respiratory failure may occur should the child remain in a status condition for a prolonged period of time (Chai & Newcomb, 1973). Death from asthma is rare, however (Creer *et al.*, 1982).

The relationship between the medical and the behavioral sciences has perhaps been more harmonious in the case of asthma than in the case of any other physiological disorder. Chai, Purcell, Brady, and Falliers (1968) emphasized the importance of collecting data on asthma in both medical and behavioral spheres, as each source yields different information that may be only moderately correlated, hence covarying independently. Creer *et al.* (1982) provided a structured outline of the medical and behavioral assessment of asthma. Here, we follow this outline, which presents the medical assessment initially, followed by the behavioral assessment techniques.

## *Medical Assessment*

### *Clinical Examination*

The first category of assessment within the medical evaluation is the clinical examination (Chai, 1975; Chai & Newcomb, 1973; Creer *et al.*, 1982). It is at this point that the physician conducts a detailed history and completes various medical tests. Included in the test series are bronchial challenges, blood eosinophil counts, and skin tests evaluating for allergens (Creer, 1982). These tests are important factors in the confirmation of the diagnosis and also yield information regarding the parameters of the child's asthma attacks.

Direct observation of an attack may also provide useful information on the features of a child's attack, as well as on the efficacy of various treatment procedures (Creer *et al.*, 1982). Observation lessens the physician's need to rely on the patient's report of attack features, which may be unreliable (Chai *et al.*, 1968). Observation of a patient's attack may also aid in the differential diagnosis of asthmatic versus nonasthmatic wheezing (Creer *et al.*, 1982).

### *Pulmonary Function Measures*

Given that asthma is defined as a disorder that is characterized by bronchial constriction, pulmonary function measurements become important in the confirmation of the diagnosis, as well as in repeated assessment of the disorder (Chai, 1975; Chai & Newcomb, 1973). Additionally, the pulmonary function measures are useful in assessing the degree of small versus large airway involvement in the asthma (Sirota, 1982).

A number of pulmonary function measures are available, some being less cumbersome than others. Some of these are spirometric techniques, full-body

TABLE 1. Asthma Pulmonary Function Measures

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Device:	Spirometer
Measures obtained:	<ol style="list-style-type: none"> <li>1. Forced vital capacity (FVC)—maximum amount of air expelled following a maximum inspiration; effort-dependent; mostly large airways assessed.</li> <li>2. Forced expiratory volume in 1 second (FEV<sub>1</sub>)—volume of air expelled in first second of an expiration; effort-dependent; mostly large airways assessed.</li> <li>3. Maximal mid-expiratory flow rate (MMEF)—mean airflow rate during middle half of a forced expiration; less effort-dependent than FEV<sub>1</sub>; both large and small airways assessed.</li> </ol>
Device:	Peak flow meter
Measures obtained:	<ol style="list-style-type: none"> <li>1. Peak expiratory flow rate (PEFR)—peak rate of air outflow during an expiration; effort dependent; mostly large airways assessed.</li> <li>2. Forced expiratory volume (1 second) (FEV<sub>1</sub>)—see above.</li> </ol>
Device:	Forced-oscillation technique
Measures obtained:	<ol style="list-style-type: none"> <li>1. Total respiratory resistance (TRR)—total resistance of airways; not effort-dependent; highly sensitive to small changes in airway constriction.</li> </ol>

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phythysmography, and gas exchange assessment. Spirometric measures are the most frequently used, as they are easily employed both in the physician's office and at home (Sirota, 1982). Table 1 provides an overview of the various types of spirometric and related measures, their most frequently used abbreviations, and their definitions. Their degree of effort-dependence and whether they measure small or large airways are also noted.

In order to be meaningful, pulmonary measures must be conducted frequently because of the inherent variability in pulmonary functioning (Chai *et al.*, 1968). Chai and Newcomb (1973) recommended at least twice-daily measurements if peak flow measures are used. Spirometric and airway resistance measures can be taken less often. Advances in technology are aiding in the assessment of pulmonary functioning. Low cost and highly portable flow meters that yield reliable measures are now available (Burns, 1979). Forced-oscillation measures can be modified to yield immediate results and hence are potentially very useful in biofeedback studies (Levenson, 1974; Melamed & Johnson, 1981; Sirota, 1982).

Pulmonary function measures, although probably irreplaceable for assessment, do have inherent drawbacks. Most notable are the dependence on the child's effort and motivation. In addition, some question the potential harm of asking asthmatic children to engage in repetitive forced exhalations (Sirota, 1982).

#### *Medication Records*

Records of the medication used in the treatment of asthma may serve in the temporal assessment of the disorder's course (Creer *et al.*, 1982). The dose level and the type of medication (ranked by potency) used can yield *medication scores*,

which may serve as rough indices of severity. However, as Creer (1979) pointed out, compliance in taking medications is a problem that may interfere with medication score measures.

In a similar vein, records of hospital admission frequency and duration of admissions, as well as emergency room visits, present themselves as useful data (Chai *et al.*, 1968). However, emergency room visits and admissions may also be affected by factors other than asthma severity. For example, Creer (1970) and Creer, Weinberg, and Molk (1974) found that operant factors may potentiate hospital admissions. Characterological factors such as a propensity for panic attacks may affect the rate of presentation to hospitals, the length of stay, and adherence to medication regimes and requests for medication (Dahlem, Kinsman, & Horton, 1977). In sum, then, it becomes obvious that medication scores, as well as hospital visits and admissions, serve as rough, not exact, measures.

### *Behavioral Assessment*

Advances in technology have strengthened the role of the behavioral scientist in both the assessment and the treatment of many medical disorders (Russo & Varni, 1982). Having presented the Creer *et al.* (1982) outline for the medical assessment of asthma, we present the large role that the behavioral clinician has to play in assessing the disorder, following outlines presented by Creer *et al.* (1982), by Melamed and Johnson (1981), and by Sirota (1982).

### *Self-Report Measures*

Self-report measures or techniques such as the behavioral interview, questionnaires, and self-monitoring may be used to address a variety of issues in the assessment of asthma. One must obviously temper the use of self-report techniques with the knowledge that the reliability and validity of such measures are often difficult to assess.

### *Interview*

We have already provided an outline for the general diagnostic interview process. Several authors have noted the potentially pervasive influence that asthma can have on a child's life (Creer, 1979; Sirota, 1982). Anxiety reactions, affective disturbance, aggression, social difficulties, and school problems are all *potential* problems (Creer, 1979). One should approach the interview with the understanding that not all chronically ill (Tavormina *et al.*, 1976) or asthmatic (Purcell & Weiss, 1970) children exhibit psychiatric disturbance. However, this question must be resolved case by case. In the opposite vein, the existence of asthma does not preclude other problems.

In research related to this issue, Block, Jennings, Harvey, and Simpson (1964) developed the Asthmatic Potential Scale (APS). The APS is a five-item medically oriented index that assesses the family history of asthma and allergy,

the highest blood eosinophil percentage obtained at any episode, skin test reactivity to allergens, the total number of allergies, and the ease with which the allergies were diagnosable. Children who score high on the APS have a greater number of known somatic factors associated with their asthma, and those who score low on the measure have fewer somatic factors associated with their asthma.

Further study comparing high- and low-APS children yielded interesting results. High APS children were found to be more anxious at attacks, presumably because the attacks were more often induced by infections and other medically related causes and were less predictable and controllable. The high-APS children were rated by their parents as being more mature, adventurous, and self-confident than the low-APS children. The emotional and family picture in the case of low-APS children was more disturbed in general than that of the high-APS children. Block *et al.* (1964) found that both the parents of low-APS children rated the children as being clingy, shy, nervous, and whiny. A notable amount of mother-child pathology and marital disharmony was observed in the cases of the low-APS children as well. All these findings are even more interesting because there was no difference in the medically rated severity of the asthma between the high- and low-APS groups.

In addition to assessing for specific types of psychological problems, it seems, then, that several other areas merit exploration in the interview. For example, how are the child and parents able to discriminate the onset of an attack—if, indeed, they are able to? What are the parents' and child's attitudes toward the asthma? Either a laissez-faire underreaction or panicky overreaction on the part of the child and/or the parents can have detrimental effects on the treatment and the general well-being of the child (Creer, 1979). The potential for secondary gain represents another important focus of exploration with the child's parents (Creer *et al.*, 1974). For example, does Johnny develop asthma wheezing on mornings of exams at school? Do his parents infantilize him following his attacks?

As in all forms of behavioral assessment, an interview conducted behaviorally should follow a functional-analytic approach. Antecedent events as well as those events that occur concurrently and following attacks are noted and examined for common themes (Melamed & Johnson, 1981; Sirota, 1982). Non-psychological phenomena may also be approached from a functional-analytic perspective. Paint, weather changes, and snakes are examples of non-psychological precipitants or antecedents of asthma attacks (Creer *et al.*, 1982). Many asthma-related behaviors may be conceptualized within the traditional behavioral framework, which views problems as behavioral excesses (e.g., overuse of medication or medical facilities), behavioral deficits (e.g., social withdrawal or academic failure secondary to asthma), behaviors that are abnormal in form (e.g., excess bronchial constriction itself), and finally, behaviors that are elicited by inappropriate stimuli (e.g., bronchial constriction elicited by emotion; Melamed & Johnson, 1981). From this perspective, several specific behaviors may be delineated as targets for remediation. In sum, the behavioral interview provides a comprehensive overview of the child's, the parents', and the family's

functioning, yielding a guide for further assessment with more objective measures.

### *Self-Monitoring*

Many behavioral aspects of asthma may be assessed in an ongoing manner using either child or parent monitoring (Chai & Newcomb, 1973; Melamed & Johnson, 1981). Antecedent, concurrent, and consequent events surrounding an attack can be given close objective scrutiny if the patient and the family are trained to monitor themselves and to keep daily records. In particular, the triggering stimuli may be identified, and questions regarding emotional reactions and operant features associated with the attacks may be answered. The monitoring of attack frequency, duration, and severity provides a flexible measure of treatment efficacy (Melamed & Johnson, 1981).

Medication may serve as a dependent variable to be monitored in both clinical and research settings, particularly if medication compliance or abuse is an issue. If medication monitoring is to be used as an indicator of treatment outcome or assessment of the asthma's course, typically only medications taken in crisis provide useful measures (e.g., epinephrine or short-term steroids; Chai *et al.*, 1968).

Recording of other asthma-related events, such as cost and days missed from school, is also useful (Creer *et al.*, 1982; Sirota, 1982).

The pitfalls of self-monitoring have been presented elsewhere (Mash & Terdal, 1981). The most notable of these are reactivity and reliability, as behaviors like wheezing are difficult to define (Creer *et al.*, 1982). An additional problem in having asthmatic children self-monitor are character variables. For example, children who have a propensity to panic at asthma attacks may be overinclusive in their monitoring. In the opposite vein, children who take a very nonchalant attitude toward their asthma may be underinclusive in their monitoring, omitting many mild attacks (Melamed & Johnson, 1981).

### *Rating Scales*

Questionnaires and checklists make up the final category of self-report measures to be discussed here. As noted earlier, several child and parent questionnaires exist to assess psychological and behavioral functioning. There are a number of questionnaires specifically related to asthma as well. Matus, Kinsman, and Jones (1978) developed the Children's Respiratory Illness Opinion Survey. It is a 46-item questionnaire designed to assess seven attitudinal dimensions related to asthma (e.g., minimization of severity and passive observance). In individualizing treatment for the client, the child's attitude is an important variable, particularly as it relates to compliance with treatment (Matus *et al.*, 1978; Melamed & Johnson, 1981).

The Asthma Symptom Checklist developed by Kinsman, O'Banion, Resnikoff, Luparello, and Spector (1973) is designed to assess five symptom dimensions relating to asthma. In the order of frequency found by Kinsman *et al.*

(1973), the five categories were airway obstruction, fatigue, panic-fear, irritability, and hyperventilation-hypocapnia. Of all the dimensions on the Asthma Symptom Checklist, it seems that the panic-fear (P-F) dimension is particularly important. Indeed, panic attacks are a frequent target for psychological intervention (Creer *et al.*, 1982). Children who score high on the P-F subscale of the Asthma Symptom Checklist would be expected to be potential overusers of asthma medication and to require longer hospitalizations, whereas children at the opposite extreme may ignore their asthma, reducing the likelihood that they will attend to their disorder in an adequate manner (Melamed & Johnson, 1981). Either extreme in attitude merits intervention (Creer, 1979). Panic reactions may be treated with systematic desensitization, whereas children who show deficits in attending to their disorder (low P-F scorers) may show problems in medication compliance and in discriminating attack onset (Creer *et al.*, 1982; Melamed & Johnson, 1981).

### *Direct Observation*

The hallmark of a behavioral approach to assessment is direct observation. Certainly, direct observation has played a considerable role in the behavioral assessment of asthma (Creer *et al.*, 1982). The nature of the attacks and the environmental conditions surrounding them may be closely scrutinized in direct observation. Methodological issues, such as difficulties in operationalizing and validating target behaviors, rater reliability, and the intermittent (often low-frequency) nature of the attacks, all deserve careful consideration (Creer *et al.*, 1982).

### *Psychometric Testing*

Traditionally, the psychometric testing of asthmatic children has involved the use of projective or other types of personality measures (Creer *et al.*, 1982). At this time, asthmatic children are no longer believed to experience specific character dysfunctions as a whole (Purcell & Weiss, 1970; Werry, 1979); therefore, the role of psychometric testing has shifted to the academic realm (Creer *et al.*, 1982). Suess (1980) showed that asthma medications can have an effect on academic performance. Ongoing assessment of academic performance is therefore a worthwhile endeavor.

In general, we have presented an overview of the assessment of asthma that emphasizes the behavioral philosophies of tripartite measurement and functional analysis. Tripartite assessment is important in asthma measurement in that changes in one class of variables (cognitive, overt motoric, or physiological) are not always followed by changes in the other classes (Chai *et al.*, 1968). The functional-analytic approach to assessment is useful in empirically demonstrating relationships between asthma symptomatology and external variables.

Coverage of the treatment of asthma is beyond both the intent and the scope of this chapter. The reader is referred to Chai (1975), Chai and Newcomb



(1973), Creer (1979), and Creer *et al.* (1982) for excellent reviews of both medical and behavioral treatments of asthma.

## TICS AND GILLES DE LA TOURETTE SYNDROME

Tics are defined as sudden, rapid, involuntary movements of functionally related muscle groups and/or the involuntary production of vocal noises or words. Tics appear to serve no obvious purpose and seem to be spasmodic in nature (APA, 1980; Matson & Frame, *in press*; Yates, 1970).

Many different types of tics may be observed. Most frequent are tics involving the eyes, the face, and the entire head. Examples include eye blinks, head jerks, and facial grimaces. More complex motor tics may also be seen but are rare, such as touching others, jumping, and repeating others' movements (Shapiro, Shapiro, Bruun, & Sweet, 1978). In general, the further one travels away from the head, the less likely the occurrence of tics becomes; moreover, in cases involving tics of the extremities, the severity of the disorder is usually greater (Corbett, Mathews, Connell, & Shapiro, 1969).

Vocal tics may be present in addition to the more frequently found motor tics. Examples of vocal tics are grunts, words, yelps, and clicks. Table 2 presents a list of tics seen both frequently and infrequently.

One important dimension of tics is the number present in a given individual. A particular person may suffer from a single tic or may have several. In cases of multiple tics, the various tics may be executed in a series, one after the other. In these cases, the tic series may start in one body part and spread to others in a sort of ripple fashion. Multiple tics may occur simultaneously or randomly as well (APA, 1980; Matson & Frame, *in press*).

Despite being defined as involuntary, tics may be controlled voluntarily for periods of minutes to hours. Tics also seem to be somewhat state-dependent, in that tic frequency is reduced greatly during sleep and sexual activity (Glaze, Frost, & Jankovic, 1983). They are also known to be exacerbated by stress and emotional upset (Shapiro *et al.*, 1978; Yates, 1970).

Until the advent of the third edition, tics were not afforded diagnostic status in the *Diagnostic and Statistical Manuals* of the American Psychiatric Association. DSM-III categorizes tics under the general rubric of "Stereotyped Movement Disorders." Specifically, tics are subtyped in DSM-III along the dimensions of their chronicity and their form. Four categories are delineated: transient tic disorder, chronic tic disorder, Tourette disorder, and atypical tic disorder.

### *Transient Tic Disorder*

This disorder is characterized by single or multiple motor and/or vocal tics. Vocal tics are rare in the transient tic disorder (Shapiro & Shapiro, 1981); the most frequent tics are of the face and head. Onset is during childhood or early adolescence. As with all tics, the tiqueur is able to suppress the behavior for varying lengths of time. The frequency and form of the tics are variable, waxing

TABLE 2. Common and Less Common Examples of Tic Behaviors

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Simple motor tics
Eye blink
Shoulder shrug
Jerking of limbs
Facial grimace
Twitch of cheek
Head jerk
Head nod
Vocal or nasal tics
Snorts
Sniffs
Loud exhale
Grunts
Sighs
Barks
Throat clearing
Words
Yelps
Coughs
Echolalia—repeat words of others
Coprolalia—obscene words
Palilalia—repeat own last words
Complex motor tics
Jumping
Retracing steps
Bend to touch floor
Touch others or objects
Tapping
Hitting
Echopraxia (echokinesis, echotaxia)—repeat others' actions

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and waning over time. Finally, to be classified as a transient tic, the duration of the symptoms must be a minimum of one month but no longer than one year.

### *Chronic Motor Tic*

Chronic tic disorder is also characterized by single or multiple motor and/or vocal tics. No more than three muscle groups may be involved, according to DSM-III criteria. Again, vocal tics are rare in this disorder. If they occur, they are usually due to constriction of the diaphragm (Shapiro & Shapiro, 1981). The tiqueur is capable of tic suppression for periods of minutes to hours. The minimum duration of the disorder, to merit the diagnosis of chronic, is one year. Typically, the disorder is lifelong (Shapiro & Shapiro, 1981, 1982). The tics in the chronic forms of tic disorder are usually of a lower frequency than in transient tic disorder or Tourette disorder (Shapiro & Shapiro, 1982). Little change in the course of chronic tics is noted, in direct contrast to the course of the transient and Tourette disorders. Onset is usually during childhood or after age 40 (APA, 1980; Shapiro & Shapiro, 1981, 1982).

## *Tourette Disorder*

To date, Tourette disorder is the only tic *syndrome* that has been isolated (Yates, 1970). DSM-III defines the disorder as follows: (1) onset between ages 2 and 15; (2) multiple motor tics; (3) multiple vocal tics; (4) the tiqueur is able to suppress the tic behavior for varying periods; (5) waxing and waning course; and (6) tics of greater than one year's duration.

Although the age of onset ranges from 2 to 15, a definite clustering exists at the frequently reported mean age of onset of 7 years (Shapiro *et al.*, 1978; Shapiro & Shapiro, 1982). The initial symptoms are most often eye tics (35%), facial tics (45%), and, less frequently, coprolalia (1%) or obscene utterances (Shapiro & Shapiro, 1982). Because of the subtlety of these initial symptoms, Tourette disorder is often misdiagnosed in its early stages (Shapiro *et al.*, 1978).

The motor tics are most often facial, but the upper torso and extremities may be involved (Corbett *et al.*, 1969; Messiha & Carlson, 1983). The complex motor tics presented in Table 2 accompany Tourette disorder almost exclusively, as do the echo phenomena presented there also. Tourette disorder is always characterized by multiple tics, head involvement, and verbal tics (Shapiro & Shapiro, 1981). In any given tic event, verbal tics usually follow a motor tic (Mesiha & Carlson, 1983).

As noted in the DSM-III criteria, variability in course is highly characteristic of Tourette disorder. Symptoms wax and wane over time and may even remit for long periods or permanently (Mesiha & Carlson, 1983). The frequency of tics is extremely variable, not only across individuals but within the same individual. The frequency of the tics may range from infrequent to uncountable (Leckman, Detlor, & Cohen, 1983). Fatigue and stress may exacerbate tic frequency, whereas sleeping, sexual activity, or intense interest in an activity often suppresses tic behavior (Leckman *et al.*, 1983; Shapiro *et al.*, 1978).

The disorder also appears to be subject to developmental phenomena as well. The consistent age of onset is 7, a finding believed by many to have developmental significance (Shapiro *et al.*, 1978). The symptoms seem to blend in the disorder. Initial vocal tics such as coughs or sighs, often develop into tics consisting of audible words. Similarly, motor tics frequently occur developmentally before the onset of verbal tics, usually up to five years beforehand (Mesiha & Carlson, 1983). The earlier the onset, the more likely it is that the disorder will follow the well-known rostral-caudal development pattern (Leckman *et al.*, 1983). This pattern is characterized by an initial presentation of tics in the head region, with tics in regions distant from the head occurring at later times, roughly proportional to the distance of the body part from the head.

## *Atypical Tic Disorder*

This category is a repository for individuals who do not meet criteria for the other DSM-III tic categories.

The tic categories put forth in DSM-III are for the most part new; hence, much of the previous literature has not made adequate diagnostic distinctions. A

result of this difficulty is some confusion in interpreting epidemiological as well as other types of research reports regarding tics. Generally, between 1% and 50% of the elementary-school population have been estimated by various reports to experience tics to some degree, with tic behavior of a clinical degree usually estimated at between 5% and 15% (Azrin & Nunn, 1977; Matson & Frame, in press; Rutter, Graham, & Yule, 1970; Shapiro *et al.*, 1978; Torup, 1962). It seems that children make up a significant majority of the tiqueur population (Matson & Frame, in press). Estimates of the incidence of Tourette disorder specifically indicate frequencies of between .01% and 1.6% of the population (Messiha & Carlson, 1983; Shapiro & Shapiro, 1982; Shapiro *et al.*, 1978). In a comprehensive review, Shapiro *et al.* (1978) estimated that, by age 13, up to 18% of the child population has experienced tics to a clinical degree. Shapiro *et al.*'s estimates for a pediatric medical population (28%) and a pediatric psychiatric population (40%) are considerably higher. A finding that has emerged with amazing consistency in the literature is that, for all types of tics (including Tourette disorder), boys outnumber girls 3–4 to 1 (Corbett *et al.*, 1969; Golden, 1977; Shapiro & Shapiro, 1982; Shapiro, Shapiro, & Wayne, 1972).

Approximately 20%–40% of children with tics or Tourette disorder have a family member(s) who has a history of the disorder (Golden, 1977, 1978; Torup, 1962). Some ethnic differences have been noted for Tourette disorder; however, it is not known if these differences relate to other tic forms also. In their review, Shapiro *et al.* (1978) found that the Tourette population was comprised of individuals of Eastern European Jewish descent at frequencies up to 67%. Blacks seem to be at a much lower risk for the disorder than whites. Tourette disorder is not related to socio-economic status, mother's age at birth, or birth trauma or problems (Shapiro & Shapiro, 1982; Shapiro *et al.*, 1972).

Little is known of the natural course of tic disorders because of the many well-known problems associated with longitudinal research. All of the reports relating to prognostic issues in tics are retrospective. For tics in general, it appears that up to 50% of the children can be expected to outgrow the problem (Corbett *et al.*, 1969; Torup, 1962). Eye tics and facial grimaces, it would seem, are the most lingering (Torup, 1962). In the specific case of Tourette disorder, it has been estimated that from 4% to 19% of children experience spontaneous remission (Bruun, Shapiro, Shapiro, Sweet, Wayne, & Solomon, 1976; Corbett *et al.*, 1969; Shapiro & Shapiro, 1982). Onset between ages 6 and 8 is associated with a better prognosis in Tourette disorder, as opposed to earlier or later onset (Corbett *et al.*, 1969). Coprolalia, which is present in up to 60% of Tourette cases (Shapiro *et al.*, 1978), is indicative of a poorer prognosis, as is lower limb involvement in the tic syndrome (Corbett *et al.*, 1969).

There has certainly been no lack of theorizing regarding the etiology of tics and Tourette disorder. Matson and Frame (in press), noting the historical progression of the various theories, have divided them into five classes; homeostatic, organic, developmental, behavioral, and psychodynamic. Early attempts at theorizing were primarily psychoanalytic. With the advent of behavior therapy in the 1950s, dissatisfaction with psychoanalytic models led to behavioral

hypotheses. The 1960s brought the advent of developmental and organic theories in accordance with the biological *zeitgeist* developing within psychiatry.

Psychoanalysis postulates underlying intrapsychic conflict as the primary etiological factor in tic behavior (Matson & Frame, in press; Shapiro *et al.*, 1978). As is the norm for this school of thought, there exists a wide variation in the types of symbolism and conflicts expressed in the form of tic behavior. Tics have been viewed as displaced sexual urges, as anal conflicts, and as the results of disordered mothering (cf. Matson & Frame, in press; Shapiro *et al.*, 1978). Despite the plethora of theorizing provided by psychoanalytic writers, few or no empirical data exist supporting their views on either the etiology or the treatment of tics.

Behavioral theories of psychopathology began in the 1950s, in part as a direct reaction to the psychoanalytic school of thought. Some early conceptualizations of tics viewed them as nervous habits (Olson, 1929). Later individuals, such as Yates (1958), began to systematically apply what was known of the laws of learning to tic behavior. Yates (1958, 1970) borrowed heavily from Hullian learning principles in his scheme, which proposes that, through the fortuitous pairing of a tic behavior and stress reduction, a tic can acquire drive-reducing properties and hence become reinforcing. It is at this point that the tic behavior may function autonomously. This conceptualization has received limited empirical support, in that behavioral treatments based on the Hullian model (e.g., massed practice) have been demonstrated to be only somewhat effective (Turpin, 1983).

Along similar lines, operant conditioning has been proposed to play a role in the acquisition and maintenance of tics (Yates, 1970). As one might expect, the basic premise within this paradigm is that tic behavior may be, by chance, followed by a positive event (reinforcement) that serves to strengthen and maintain the behavior. Like the previous behavioral model, the operant model has received only limited support in the treatment literature (Turpin, 1983).

Some view tic behavior as serving a homeostatic function. The primary premise within this conceptualization is that tic behavior serves to maintain some optimal level of arousal in the body (cf. Matson & Frame, in press). In other words, the tics may serve the purpose either of arousing an understimulated individual or relaxing an overly stimulated (stressed) individual. On the face of it, this model seems difficult to evaluate, as many of the observations supposed to fit it also fit other models. For example, some people do report an increase in tic behavior while relaxed. Although this observation fits the homeostatic model, it is also open to the interpretation of disinhibition, as relaxation, by definition, inhibits the control the individual may have been exerting over the tic behavior (Shapiro *et al.*, 1978). The exacerbation of tics by stress may also be explained by the Hullian model put forth by Yates (1958, 1970).

Developmental phenomena have also been implicated in tic etiology. The high incidence of childhood onset is viewed by many as indicative of developmental phenomena (Shapiro *et al.*, 1978). Tourette disorder seems to have a developmental progression, in that vocal tics and complex motor tics are nearly

always preceded by facial tics (Messiha & Carlson, 1983). The relatively high rates of spontaneous remission of tics and Tourette disorder, as well as their very transient nature, may indicate developmental involvement. At best, our evidence in this sphere is tentative.

Beginning in the 1960s, along with the beginnings of the biological *zeitgeist* in psychiatry, organic factors received increasing emphasis in the etiology of tics. The lack of demonstrable emotional problems in many tic cases, as well as the ineffectiveness of traditional psychiatric treatment in eliminating tics, had the net effect of deemphasizing the role of psychological factors in the eyes of many researchers (Shapiro *et al.*, 1978). Many data, particularly those collected in regard to Tourette disorder, began to accumulate in support of organic factors as the underlying etiological variables in tic behavior. The following have been considered important results supportive of organic tic etiology:

1. Many Tourette patients have been demonstrated to have abnormal EEGs and specific visual, spatial, and visual-motor deficits in psychological test batteries.
2. Drugs, particularly those affecting dopaminergic activity have been highly effective in treating tics.
3. Some investigators have found positive family histories for tics in their patients. This factor is taken as possible evidence for genetic transmission of the disorders (Comings & Comings, 1984).

Although some of these findings have emerged consistently in the Tourette literature, their generalizability to other forms of tics is unknown at this point. Further research using more sophisticated diagnostic differentiation of tic subtypes is certainly warranted.

### *Assessment and Diagnostic Issues*

Differential diagnosis and comprehensive assessments of tic disorders and their associated features often require careful collaboration between pediatricians, pediatric neurologists, and/or behavioral clinicians. Again, most of the data having to do with differential diagnostic issues and problems associated with tics come from the Tourette literature; thus, generalization to other tic forms can be done only with caution. Nevertheless, it is useful to point out that Tourette disorder, for example, is misdiagnosed as psychological problems or other neurological difficulties at rates that are indeed staggering. Some estimates of misdiagnosis well over 50% have been reported (Goggin & Erickson, 1979; Golden, 1977; Jagger, Prusoff, Cohen, Kidd, Carbonair, & John, 1982). These figures point out the need for a detailed, comprehensive assessment.

Typically, one of the initial steps in the evaluation of tics and Tourette disorder is the neurological exam. It is at this point that tics are distinguished from other disorders of neuromotor origin (Yates, 1970); such as spasms, choreas, seizures, myoclonic movements, and athetoid movements. Table 3 presents an extended list of neuromuscular disorders to be distinguished from tics in a neurological exam. In the specific case of Tourette disorder, EEG studies

TABLE 3. Some Neuromuscular Disorders to Be Distinguished from Tics

Descriptive term	Behavioral presentation
Athetosis	Writhing, slow twisting of limbs or other parts of body.
Chorea	Rapid, jerky movements of body parts serving no purpose.
Choreoathetosis	Combined manifestation of chorea and athetosis.
Dystonia	Abnormal postures of sustained, slow, twisting nature, interspersed with tense states.
Myoclonus	Rapid jerking of body parts; usually affects parts of or possibly a whole muscle; flexors dominate, without whole muscle group being involved.
Spasm	Involuntary tensing of muscles; rapid in nature; prolonged.
Torticollis	Lateral turning of head; may be prolonged or spasmic.
Tremor	Rapid alternating movements due to antagonistic muscles; involuntary.
Hemiballismic movements	Unilateral, interspersed, jumping movements of limbs.
Hemifacial spasm	Unilateral, jerky, repeating movements of facial muscles.
Dyskinesia	Abnormal tone and or movement; may be silent oral movements or choreoathetoid movement of limbs.

may also be conducted by the neurologist. Several reports indicate abnormal EEGs in up to half of Tourette patients (Glaze *et al.*, 1983; Volkmar, Leckman, Detlor, Harcherik, Prichard, Shaywitz, & Cohen, 1984). Sleep disturbances have also been reported, indicating the potential need for sleep EEGs in some Tourette patients (Glaze *et al.*, 1983).

Several kinds of problems may be associated with tics (particularly in Tourette disorder). Included are difficulties in adaptive functioning, learning disabilities, speech pathology, attentional deficits, and secondary or reactive anxiety (Bakwin & Bakwin, 1972; Bauer & Shea, 1984; Comings & Comings, 1984; Corbett *et al.*, 1969; Messiha & Carlson, 1983; Shapiro & Shapiro, 1982). Given the well-documented nature of these various difficulties, it becomes obvious that the comprehensive diagnostic assessment procedure outlined earlier is necessary.

As the first stage in this process, the interview is useful in establishing onset, frequency, the intensity of the symptoms, and the situational variability of the tic behavior (Matson & Frame, *in press*). From there, the general diagnostic categories, social history, family history, and school history all merit coverage in the interview.

Of the major child-psychiatric diagnostic categories, several are of particular importance. Attentional deficits co-occur at a high frequency in Tourette disorder (Bauer & Shea, 1984; Comings & Comings, 1984). Some estimates range as high as 60% of Tourette patients meeting criteria for attention deficit disorder with hyperactivity (ADD/W; Comings & Comings, 1984). Some suggest a possible genetic link between the two disorders (Comings & Comings, 1984). No data regarding the possible occurrence of attentional deficits without hyperactivity have yet been reported.

Anxiety problems are an important focus of investigation for two reasons.

First, stress or anxiety has been implicated in the etiology of transient tic disorders (Bakwin & Bakwin, 1972; Yates, 1970). Anxiety may exacerbate the expression of tic behavior as well. Second, a number of investigators have postulated a converse relationship between anxiety and tics (Corbett *et al.*, 1969; Shapiro & Shapiro, 1982). Specifically, these investigators have found significant frequencies of anxiety problems secondary to, and perhaps resulting from, the highly embarrassing behavior that often characterizes Tourette disorder. The ritualistic or compulsive types of behavior often associated with Tourette disorder (Shapiro & Shapiro, 1982) may present as a differential diagnostic issue with some of the more complex motor tics seen in this disorder. The primary differentiating dimensions in this case are that true compulsive behaviors (e.g., checking) are usually more complex than tic behavior and clearly serve an anxiety-reducing purpose that tics do not (Matson & Frame, *in press*; Yates, 1970).

Social withdrawal may be another secondary reaction to embarrassing tic behavior; hence, an assessment of the child's current level of social and adaptive functioning is merited. Social withdrawal to the extent of school phobia has been reported by some investigators (Bauer & Shea, 1984). Although social functioning may be affected by tics, Shapiro *et al.* (1978), in their extensive review of the tic and Tourette literatures, found no evidence of increased frequencies of characterological pathology in tic populations, a conclusion that is a direct contrast with the psychoanalytic school of thought.

Few or no data exist regarding the potential for concurrent problems in academic functioning with transient or chronic tics. However, with relative consistency, specific neuropsychological and academic deficits have been identified as potential concomitants of Tourette disorder. Most studies indicate that Tourette patients are of average intelligence (Bornstein, King, & Carroll, 1983; Corbett *et al.*, 1969; Shapiro *et al.*, 1978). Clear problems in visual-motor integration and letter copying seem to characterize many of the Tourette population (Harcherik, Carbonari, Shaywitz, Shaywitz, & Cohen, 1982; Incagnoli & Kane, 1981). On the WISC-R, many do most poorly on the coding subtest and have Performance IQs that are significantly lower than their Verbal IQs (Bornstein *et al.*, 1983; Harcherik *et al.*, 1982; Incagnoli & Kane, 1981; Shapiro *et al.*, 1978). Tourette subjects seem to be deficient in arithmetic, in comparison with the linguistic subject areas of reading and spelling (Incagnoli & Kane, 1981). Interestingly enough, arithmetic performance appears to be deficient only when a written computational component is introduced. Often, Tourette children score in the average range on the highly verbal WISC-R arithmetic subtest but do poorly on achievement test arithmetic sections that require written calculation (Incagnoli & Kane, 1981). It seems, then, that a complete academic assessment is advantageous in the case of Tourette patients.

Developmental history also deserves careful consideration in the diagnostic interview and process. Again, although little or no information regarding transient or chronic tics is available, Tourette disorder is associated with significant frequencies of delays in developmental milestones (Shapiro & Shapiro, 1982; Shapiro *et al.*, 1972). A related issue is that, although tics and Tourette disorder



do not seem to occur at elevated frequencies in developmentally delayed populations such as mentally retarded persons (Matson & Frame, in press), they (in particular for Tourette disorder) may be more difficult to diagnose in these instances. A particular problem related to this issue is differentiating the stereotypical behavior often seen in developmentally delayed individuals from complex motor tics, as seen in Tourette disorder (Golden & Greenhill, 1981; Yates, 1970). The characteristics that seem to distinguish stereotypical behavior from Tourette disorder are that the former are often self-injurious and seem to be pleasurable to the individual engaging in the behavior, and that anxiety reduction can often be identified as a maintaining factor (Matson & Frame, in press). Golden and Greenhill (1981) noted that, in severely disturbed and delayed populations, Tourette disorder is often underdiagnosed, as the tic behavior is frequently viewed as bizarre behavior related to the psychiatric disturbance.

A final point of emphasis within the general diagnostic interview process is noteworthy, that is, family history and psychiatric status. At least one study has found a significant rate of parental problems in Tourette patients (Corbett *et al.*, 1969). These investigators reported that 50% of the mothers of the Tourette patients in their study had affective disorders. Possibly, then, the child is not the only individual who is taxed by the adjustment to this troubling disorder.

Concurrently with both the diagnostic and the treatment processes, several behavioral assessment techniques have found widespread use. In particular, direct observation, self-monitoring, and rating scales are of potential value in objectively quantifying tic behavior.

Tics can be clearly defined and observed by significant others in the child's environment. This method, although relatively unobtrusive, suffers from the problems of potentially deficient reliability and cumbersome procedures, as it is difficult to observe for long periods of time. Clearly defining the tics is helpful in maintaining rater reliability. Observing at selected times (time sampling) can greatly reduce the amount of time spent in observation. Clearly, the interview can serve as a means of delineating the times during which tic behavior may be worse.

The clients themselves may self-monitor tics, as well as use the time-sampling procedure noted above. Tallies on cards or wrist counters may provide frequency counts of tic behavior. Clients using self-monitoring can also record additional data, such as anxiety levels and social avoidance, on their record sheets in order to provide continuous data on these phenomena. Self-monitoring is not without problems either. Most notable are the well-documented reactive effects of such measures and the fact that many tiqueurs remain relatively unaware of their tic behavior; hence, they may require training to self-monitor (Matson & Frame, in press).

Rating-scale measures are a new and welcome addition to the behavioral assessor's tools. To date, the only standardized rating scale is that of Harcherick, Leckman, Detlor, and Cohen (1984). The Tourette's Syndrome Global Scale (TSGS) is a clinician's rating form that rates the frequency, complexity, and disruptive function of the patient's tics. Social functioning is a final tic-related

dimension recorded on the TSGS. Preliminary data on the scale indicate adequate reliability of the measure. Certainly, rating scales can provide a useful and economic method of behaviorally assessing tics.

In sum, the diagnostic assessment of tics is an endeavor requiring much cooperation between pediatric neurology specialists and the behavioral clinician. Behavioral techniques such as the interview, observation, self-monitoring, and rating scales are of particular use in assessing tics.

Additionally, behavioral techniques have been found to be efficacious in the treatment of transient tic disorders (Turpin, 1983). However, Tourette disorder remains resistant to all forms of psychological treatment; generally, the treatment of choice for Tourette disorder is haldol, a major tranquilizer (Shapiro *et al.*, 1978). The reader is referred to the previous two references for comprehensive overviews of the medical and behavioral treatments of tics and Tourette disorder.

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# 17 Selected Chronic Physiological Disorders II

## *Gastrointestinal, Headache, and Seizure Disorders*

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This chapter continues the coverage of physiological disorders begun in the previous chapter. It includes three groups of disorders seen by psychologists: gastrointestinal, headache, and seizure disorders. Each is discussed in some detail.

### GASTROINTESTINAL DISORDERS

We have opted to cover three disorders in this section: peptic ulcers, ulcerative colitis, and recurrent abdominal pain. The assessment of ulcers and colitis is covered following presentation of their individual clinical manifestations. Recurrent abdominal pain is covered in a separate subsection.

#### *Peptic Ulcers*

Peptic ulcers are ulcerations or lesions of the mucous membranes of the stomach and/or the uppermost section of the small intestine (Wright, Schaefer, & Solomons, 1979). Ulcers are the direct result of either abnormal gastric secretion or deficits in tissue resistance to gastric acids and enzymes. It appears that hyperacidity plays a large role in duodenal ulceration, whereas problems in tissue resistance play a more important role in gastric or stomach ulceration (Hamilton & Herbst, 1983). In early-onset ulceration, before the age of 2, data indicate the ratio of gastric to duodenal ulcerations to be equivalent; however, by age 7, most cases of ulcers are duodenal (Hamilton & Herbst, 1983). Some estimates of the frequency of duodenal ulceration in these later years are between 90% and 97% as compared to gastric ulcers (Wright *et al.*, 1979).

The observable and self-reported symptoms of ulcers change with age as well. Early-onset ulceration, before age 2, is characterized by vomiting, slow growth, and hemorrhage. Preschoolers present with dull, aching, periumbilical pain, vomiting, and hemorrhage (Hamilton & Herbst, 1983). With increase in age, a number of additional symptoms seem to enter the picture. Older children (late preschool and older) present with primary symptoms of periumbilical pain, nausea, vomiting, frontal tension headache, and bleeding (Prouty, 1970; Robb, Orszulok, & Odling-Smee, 1972; Wright *et al.*, 1979). The pain is often dull, in contrast to the sharp pain so frequently reported by adult ulcer patients. Pain may be particularly noticeable just before meals, on school mornings (Prouty, 1970; Wright *et al.*, 1979), or following severe emotional stress (Tabaroff & Brown, 1954). The pain may or may not be relieved by ingestion of food (Prouty, 1970; Robb *et al.*, 1972). Nocturnal pain sufficient to waken the child is sometimes reported (Prouty, 1970). Other associated symptoms that occur in a smaller degree include anorexia, black, tarry, foul-smelling stools, and minor flatulence (Prouty, 1970; Robb *et al.*, 1972). Interestingly enough, children do not report the heartburn so commonly noted by adult ulcer patients (Robb *et al.*, 1972).

Ulcers have been believed to be an extremely rare disorder in children. Many note that detection of the disorder is increasing both because of an actual increase in its occurrence and because of improved medical-technological advances in the detection of the disorder (Sultz, Schlesinger, Feldman, & Moshe, 1970; Wright *et al.*, 1979). One large epidemiological study comparing the period of 1947–1949 with 1956–1958, noted an increase in ulcers from .5 to 3.9 out of 100,000 children (Sultz *et al.*, 1970).

The lowest incidence rate appears to be in the 0 to 4-year-old age group; increasing frequencies characterize each successive age group (Robb *et al.*, 1972; Sultz *et al.*, 1970). In their sample of 49 children, all under age 13, Robb *et al.* (1972) found that 18% of the patients had had an onset of symptoms between 0 and 4 years of age, 35% had had symptom onset between 5 and 8, and 47% had had onset of symptoms between 9 and 12. A striking peak in the onset of ulcer development has been observed at age 15, particularly for boys (Sultz *et al.*, 1970). Robb *et al.* (1972) reported that, on the average, two years of symptomatology elapses before a diagnosis of peptic ulcer is given. Wright *et al.* (1979) feel that this gap in time between symptom onset and diagnostic confirmation is the result of a general bias or hesitancy on the part of physicians to diagnose this condition in children.

Boys tend to outnumber girls in the pediatric ulcer population by 1.6 (Rebhun, 1975; Sultz *et al.*, 1970) to 3.0 (Robb *et al.*, 1972). The difference in the sex ratio is particularly true in older children (Sultz *et al.*, 1972). Although no socioeconomic variation has been found for girls, it seems that boys from higher socioeconomic groups are more ulcer-prone (Sultz *et al.*, 1972). Interestingly enough, with an overall mortality rate of 5%, girls appear to be twice as likely as boys to die from ulcers, despite being underrepresented in the pediatric ulcer population as a whole. Children with an earlier onset of symptoms and those

from lower socioeconomic groups have also been found to be overrepresented in the mortality figures (Sultz *et al.*, 1970).

Although numerous theories, both medical and psychological, have been proposed, the etiological factors underlying pediatric ulcer remain unclear. Genetics has received considerable emphasis in the literature. Children with ulcer disease have high rates of positive family history for the disorder. These family history rates generally run from 40% (Robb *et al.*, 1972) to 65% (Prouty, 1970; Sultz *et al.*, 1970). Pediatric ulcer patients, in direct contrast to their adult counterparts, have not been found to be hypersecreters of gastric fluids (Robb *et al.*, 1972; Wright *et al.*, 1979). This finding has led some investigators to propose a genetic hypersensitivity to digestive acids and enzymes as an important etiological factor (Wright *et al.*, 1979).

The immunological system has also been implicated. Recent studies indicate that children with ulcers have higher rates of allergies than would be expected, and that infections often precede the onset or aggravation of ulcer symptoms (Prouty, 1970; Rebhun, 1975). Rebhun (1975) proposed that allergy and stress chronically elevate the levels of histamines and related biochemicals. This condition, in addition to possible food sensitivities and the use of ulcerogenic drugs, may result in ulcerative lesioning.

It has also been found that there is a disproportionately high number of ulcer patients with type O blood (Robb *et al.*, 1972; Wright *et al.*, 1979). The etiological significance of this finding remains unknown.

Very little systematic research has been conducted on the potential role of psychological variables in the etiology of ulcer. This is surprising, given the relative dominance of psychological theorizing in the adult ulcer literature. The little research that does exist in the area may be criticized as being vague description of personality types, and as using nonquantifiable and unreliable techniques such as projectives (Wright *et al.*, 1979). As a result, the conclusions of such studies are often confusing and quite contradictory. For example, pediatric ulcer patients have been described as being perfectionistic, high-strung, and nervous, and as having a high need for approval (Prouty, 1970). Wright *et al.* (1979), in their review, noted that ulcerative children have been described both as schizoid, immature/withdrawn types and as assertive and outgoing.

Stress has been found to play a significant role in the etiology of ulcer (Prouty, 1970; Robb *et al.*, 1972; Sultz *et al.*, 1970; Wright *et al.*, 1979). Sultz *et al.* (1970) reported several findings in their study: increased ulceration in teens compared to younger children, a disproportionate risk for high-SES boys, a high frequency of mixed religion in the patients' parents, and a high frequency of reported marital conflict. Similarly, Robb *et al.* (1972) noted a significant amount of stress in the families of the ulcer patients they interviewed. Although there are no statistical analyses to back her assertion, Prouty (1970) reported a significant number of school problems in her sample of pediatric ulcer patients. Because of poor methodology, the data are equivocal regarding the role of psychological stress in the etiology of peptic ulcers in children. The existing data supporting the existence of associated psychological or stress difficulties with



peptic ulcers may be interpreted in two different ways. Psychological problems found to co-occur with peptic ulcers may indeed have etiological significance, or they may be adjustment reactions to a chronic illness, or both possibilities may exist. Without highly controlled prospective studies, these questions cannot be answered.

### *Idiopathic Ulcerative Colitis*

Ulcerative colitis is characterized by ulcerative lesions of the rectum, the large intestine, or the ileum (i.e., the portion of the small intestine most distant from the stomach). The lesions most often begin in the rectal area and spread toward the large and small intestines (that is, they spread proximally; Wright *et al.*, 1979). The lesions may exist in somewhat circumscribed areas, or they may be diffuse, spreading throughout the large intestine and the ileum (Wright *et al.*, 1979).

The observable and self-reported symptoms most often include chronic diarrhea, frequently with fresh blood and mucus, and lower abdominal cramps, especially before defecation. Often, anorexia is noted with an accompanying growth delay. Girls may cease to menstruate. In about 10% of colitis cases, signs of arthritis are prominent (Hamilton, 1983). Abdominal distention, rectal tenderness, and the bloody diarrhea are often cardinal signs used in the medical examination.

The onset of colitis usually comes in the preadolescent period, and most cases occur after age 9 (Hamilton, 1983; Werry, 1979). In their sample of 31 cases, Hanley and Ray (1968) found that 29% of their patients were under 11 years of age, 52% were between 12 and 14, and 19% were 15 or 16. Typically, the onset is gradual; however, it may be fulminating (Hamilton, 1983).

A fulminating onset may be characterized by fever and a perforation of tissue in a matter of days, and it is potentially life-threatening (Hamilton, 1983; Werry, 1979). Such severe initial symptomatology is seen in approximately 10% of the pediatric patients (Werry, 1979). The typical course is usually low-grade and chronic and may be accompanied by periodic anemia (Werry, 1979).

Children with colitis are at an increased risk for colon cancer. Mortality rates based on 10-year follow-ups were estimated to be from 15% (Patterson, Castiglioni, & Dampson, 1971) to 20% (Devroede, Taylor, Sauer, Jackman, & Stickler, 1971; Truelove, 1971). Poorer prognosis seems to be associated with early onset and diffuse lesions. Given the risk of cancer, surgery is sometimes conducted to remove lesions and to reduce cancer risk (Wright *et al.*, 1979).

Estimates of the sex ratio of the disorder are variable, ranging from equivalent representation of the sexes (Werry, 1979), to a 5:4 male-to-female ratio (Patterson *et al.*, 1971), to as high as a 2:1 male-to-female ratio (Hanley & Ray, 1968). Nonwhites are underrepresented in this disease population (Patterson *et al.*, 1971).

Traditionally, colitis has been viewed as a psychogenic disorder (Werry, 1981; Wright *et al.*, 1979). Most of the little research that has been conducted in

attempts to document psychopathology in pediatric colitis patients, has been traditional or psychodynamic. These children have been described as passive, dependent, and immature, and as having poor sex-role identification (see Wright *et al.*, 1979, for a review). Ulcerative colitis has been conceptualized as a disease of physiological etiology (Werry, 1979; Wright *et al.*, 1979). Of the various infective, biochemical, and immunological theories proposed, Werry (1979) posited that the immunological theory is the most popular. Indeed, an anti-colonic antibody has been isolated (McDermott & Finch, 1967).

### *Assessment*

It goes without saying that the primary assessment responsibility in the case of these two disorders lies with the physician. After the physical exam, radiographic (X-ray) techniques are the primary medical diagnostic tools for assessing peptic ulcers and ulcerative colitis, although gastroduodenoscopy and proctoscopy, respectively, are used in many cases as well.

Because of the absence of a significant body of literature regarding the psychological concomitants of the two disorders, one is left without specific guidelines to alert one to probable psychological difficulties. Wright *et al.* (1979) advocated a functional, analytic approach using such behavioral techniques as self-monitoring, so that the patient and the parents can identify potentially allergenic foods and emotionally laden events or stimuli related to exacerbations of disease episodes.

Both of these gastrointestinal disorders can be quite painful and demand significant adjustment on the part of the patient and his or her family. So far, the evidence is equivocal, and some empirical studies indicate no elevated levels of emotional or family problems in gastrointestinal disorder groups (Feldman, Cantor, Soll, & Bachrach, 1967), whereas other studies report evidence of significant child and family pathology in reaction to pediatric gastrointestinal disorders (Kashani *et al.*, 1981; Steinhausen & Kies, 1982). Most often, these adjustment problems appear to be manifested in depression and anxiety reactions in the children (Kashani *et al.*, 1981; Prouty, 1970; Steinhausen & Kies, 1982) and in marital conflict in the parents (Feldman *et al.*, 1967). Based on these observations, it is generally recommended that one screen for potential adjustment or psychological problems in a diagnostic interview, as outlined in Chapter 16.

In conclusion, although peptic ulcer and ulcerative colitis have been traditionally assumed to be disorders of psychogenic origin, more recently the role of physiological factors has predominated in assumptions about the etiology of ulcers. This situation is particularly true of colitis (Werry, 1981). Currently, medical procedures appear to be the treatment of choice (cf. Hamilton, 1983) for both disorders. A lack of research exists regarding the psychological correlates of peptic ulcer and ulcerative colitis in children. Future research in this area should provide clearer guidelines for the psychological assessment of these two disorders.

## *Recurrent Abdominal Pain*

Recurrent abdominal pain (RAP) is a symptom that is common and that often provokes anxiety in children and their parents. Oster (1972) made 18,162 observations on Danish children over an 8-year longitudinal study and noted an overall prevalence of RAP of 14.4%, with 16.7% for girls and 12.1% for boys. In his classic monograph, Apley (1975) provided much of the current knowledge on the RAP syndrome. In his study of 1,000 randomly selected British children, he observed a prevalence rate of 10.8% for both sexes combined, with 12.3% for girls and 9.5% for boys. Although there is some ambiguity about the age of onset in the RAP literature, the peak age of onset has been reported to occur anywhere from 5 to 9 years of age (Apley, 1975; Papatheophilou, Jeavons, & Disney, 1972).

Apley (1975) provided the most conservative and commonly accepted definition of RAP: (1) it is paroxysmal in nature; (2) episodes occur frequently over an extended time period (more than three episodes over three months); and (3) pain is severe enough so that it results in an interruption in the child's activity. *Paroxysmal pain* means that RAP is unpredictable, unexpected, and self-limited. RAP in children typically lasts from several minutes to an hour. If pain lasts for a day or more, organic disease should be suspected (Apley, 1975; Barr, 1983). The pain's location tends to be periumbilical, and children often describe RAP as "a dull ache," "sharp as needles," "pinching," "gnawing," and so on (Apley, 1975). The frequency and time of occurrence of RAP episodes in most children are variable. Associated symptoms include diarrhea, constipation, nausea, vomiting, headaches, pallor, and sleeplessness following attacks (Apley, 1975).

The belief that RAP is a problem of preadolescence and that children will outgrow it is not valid. From 20% to as much as approximately 35% of children with RAP continue to experience pain episodes for many years (Apley, 1975; Christensen & Mortensen, 1975; Stickler & Murphy, 1979). Two studies went on to indicate that 2%–6% of children in their respective samples developed organic disorders, such as Crohn's disease, esophagitis, and ulcers (Christensen & Mortensen, 1975; Stickler & Murphy, 1979).

As RAP has generally been thought to be of psychogenic origin, it is not surprising that very little information is available on the specific pathophysiological mechanism (Barr, 1983). The sensation of RAP is presumed to originate from nerve endings in the submucosa, the musculature, or the serosa of the abdominal organs, and the pain sensation is likely to be mediated directly by mechanoreceptors or indirectly by the release of humoral substances (Leek, 1977).

Several theories have been proposed to explain the etiology of RAP. In an attempt to demonstrate that RAP is associated with autonomic dysfunction or overreactivity, two studies (Apley, Haslam, & Tulloch, 1971; Rubin, Barbero, & Sibnija, 1967) have indicated that children with RAP evince abnormal pupillary reactivity (dilation) to a physical stressor (ice water). However, another study investigating other autonomic measures (i.e., digital blood volume pulse, heart rate, and forearm EMG) in response to a cold pressor test found no differences between RAP, hospital, and healthy control groups (Feurstein, Barr, Francoeur, Houle, & Rafman, 1982). Autonomic dysfunction has also been postulated to

underlie abnormalities of colonic function in children with RAP (Dimson, 1971). Kopel, Kim, and Barbero (1967) found that, compared to controls, RAP children demonstrated excessive rectosigmoid responses to prostigmine methyl sulfate, a parasympathetic agonist. Dimson (1971) found delayed transit time through the gastrointestinal (GI) tract in 44% of RAP children as compared to 27% in another pain group (i.e., migraine). The most widely accepted hypothesis on the etiology of the RAP syndrome is that it represents a stress reaction of childhood (Apley, 1975; Barr, 1983; Berger, 1974; Hughes & Zimin, 1978). However, evidence supporting this hypothesis is mostly restricted to clinical impression rather than substantiated by systematic, controlled investigations (Barr, 1983). Furthermore, it is rarely indicated whether stress is the cause or an effect of RAP, or both.

### *Assessment*

Despite its prevalence and the morbidity that accompanies it, RAP represents a clinical entity with a small empirical base to guide assessment. As the primary complaint is physical, a thorough medical examination is required. Initial laboratory tests usually include blood and urine analysis, examination of stools for occult blood, carmine marker transit time (i.e., to check for stool retention), and lactose breath hydrogen test to rule out lactose intolerance (Barr, 1983; Lebenthal, 1980). In an attempt to find an organic cause of abdominal pain, some physicians use invasive procedures such as EEG, GI barium studies, endoscopy, proctoscopy, and laparotomy. Some of these invasive procedures (e.g., proctoscopy and laparotomy) are often unwarranted and may further reinforce or exacerbate the condition (Lebenthal, 1980; Stickler & Murphy, 1979).

In a series of 200 children, Apley (1975) found that only 7% had organic disorders as an underlying cause of RAP. Symptoms of recurrent fever, weight loss, jaundice, changes in stool color, and persistent vomiting raise questions of a generalized disease (Barr, 1983). The medical assessment should be prompt and thorough because continuing visits to the physician over an extended period of time further increase the preoccupation with physical illness and foster anxiety in the child and the parents.

Although the presence of organic disease in RAP is low, this should not imply that all other cases have a purely emotional base. In addition, empirical studies are lacking that examine the hypothesis that nonorganic RAP is psychogenic and that environmental stress or other psychosocial factors play a role in predisposing, exacerbating, and/or maintaining the disorder. With these caveats in mind, let us discuss the areas of interest to review during the interview.

An increased prevalence of abdominal complaints in the families of children with RAP, as compared to controls, has been noted by several investigators (Apley, 1975; Christensen & Mortensen, 1975; Oster, 1972; Stone & Barbero, 1970). Stone and Barbero (1970) found that 50% of mothers and 46% of fathers had functional GI difficulties. Apley (1975) observed that 46% of RAP children had a parent or a sibling with abdominal pain, as compared to 8% for controls.

These data have been used as evidence for familial modeling or for a familial constitutional predisposition to RAP.

Although it has been found that children with RAP have a normal distribution of intelligence (Apley, 1975), it has been reported that they often exhibit emotional disturbances. Apley (1975) observed that 70% of RAP children in his study had emotional difficulties (e.g., undue fears and sleep disorders), as compared to 43% of children with organic abdominal pain. He also noted that children with RAP tend to be high-strung, fussy, excitable, anxious, timid, and apprehensive. Stone and Barbero (1970) observed insecurity, hypersensitivity, and constant worrying in their RAP sample. Liebman (1978) noted "perfectionism" in 30% of his subject sample. Although it seems that a personality profile has been drawn up, it should be used cautiously. The personality traits used to describe RAP children are similar to those used in other pain disorders (e.g., headache); therefore, these personality traits may be of doubtful use in the differential diagnosis.

Questions about the environment of the RAP child are especially pertinent because of the presumed role of stress in the etiology of RAP. The most common sources of stress have to do with family conflict and school (Apley, 1975; Berger, Honig, & Liebman, 1977; Farrell, 1984; Hugh & Zimin, 1978; Leibman, 1978; Stone & Barbero, 1970).

Excessive parental anxiety about the child's pain has been observed and can serve as a strong contingent reinforcer of pain behavior (Apley, 1975; Hugh & Zimin, 1978). Problems with peers and teachers are common, and school difficulties may be so pervasive that school phobia may be suspected (Berger, 1974).

Several psychological disturbances should be considered in the differential diagnosis. Given the presumed relationship between anxiety and abdominal pain with no physical basis, and given the personality profile of children with RAP, overanxious disorder as described in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) (APA, 1980) may be indicated. Other anxiety disorders, such as separation anxiety (i.e., using abdominal pain to stay home with an attachment figure) and school phobia (i.e., using abdominal pain in order to avoid feared stimuli associated with going to school) should be carefully ruled out. Abdominal pain can also present as symptoms of depressive illness. A study by Hughes (1984) reported that 23 children hospitalized for nonorganic RAP met the DSM-III criteria for a major depressive episode. Finally, the DSM-III somatization disorder and psychogenic pain disorder should also be part of the differential diagnosis. Ernest, Routh, and Harper (1934) reported that 108 children with nonorganic RAP evinced a greater number of somatic complaints than 21 children with organic RAP and a group of 14 children with organic findings unrelated to pain. Furthermore, Routh and Ernest (1984) observed a preponderance of somatization disorder in relatives of children with nonorganic RAP, as compared to relatives of children with organic RAP. If the assessment data indicate that secondary gain predominates in the clinical picture, psychogenic pain disorder may be suggested.

Surprisingly, the use of self-monitoring in the RAP literature is almost nonexistent. In an attempt to investigate the relationship between anxiety and RAP,

a study by Barr, Feuerstein, Iezzi, and Hanley, (1985) examined daily mood and pain ratings in nonorganic RAP and in a control group matched for age, sex, socioeconomic status, and ethnicity. All subjects were required to complete the Spielberger State-Trait Anxiety Inventory four times a day for 21 days. Also, over the same period, all subjects were requested to indicate the occurrence, the duration, the intensity, and the possible trigger sources of RAP and other types of pain (e.g., headache). There was little evidence that children with RAP reported higher levels of trait anxiety, higher levels of mean state anxiety over pain and nonpain days, or more variability in state anxiety than the control group. These investigators also reported that children and adolescents were able to monitor their anxiety and pain episodes with considerable changes both within a day and across days.

The same paucity of data is evident in the psychophysiological assessment of RAP children. Currently, in an attempt to assess the relationship between naturally occurring stress and its transduction into physiological changes that could exacerbate pain episodes, ambulatory recorders (similar to the holter monitors used by patients with cardiovascular disorders) have been used by Barr, Feuerstein, Iezzi, and Hanley. The ambulatory recorder is a box with electrode leads that are attached to disposable surface electrodes. The recorder can be positioned on the hip, where it can be held in place by a belt. The rationale for ambulatory recording is that children with RAP should experience an increase in heart rate and abdominal electromyography (an indirect measure of the hypothesized pain site) and a reduction in gross motor activity in response to pain episodes and other specified stressors. The data of this investigation are still being analyzed and should be reported shortly.

In sum, other than medical procedures and the interview, there are very few guidelines to the assessment of RAP. The recent development of an anxiety and pain diary and the use of ambulatory recording with RAP children appears to be promising.

## HEADACHE

Although there is an extensive literature on chronic headache in adults, there is considerably less information concerning the topography, assessment, and treatment of chronic and recurrent headaches in children and adolescents. Moreover, most of the empirical literature has concentrated on migraine, and very little attention has been given to other types of headache (e.g., muscle-contraction). Following is a discussion of the incidence, the classification defining characteristics and symptoms, the etiology, and the assessment of chronic and recurrent headaches in children and adolescents.

The classic epidemiological study investigating the prevalence of headaches in childhood populations was conducted by Bille (1962). The results were derived from a questionnaire given to approximately 9,000 school children between ages 7 and 15 in Uppsala, Sweden, during 1955. This study showed that,

by age 7, approximately 40% of children have experienced headaches. By age 15, this figure had risen to 75%. Bille estimated that the incidence of migraine headaches in children is about 5% by age 11 and 7% by age 16. The sex distribution varies as a function of age: child migraineurs under 10 are approximately equally distributed, and by 13–15 years of age, 60% are females. Fifty-four percent of children experienced nonmigraine headaches (types of headaches unspecified). Deubner (1979) found that 9% of 2,027 Danish children between the ages of 15 and 17 had had migraines. More recently, Sillanpaa (1983) found that the overall headache prevalence increases from 37% to 69% between age 7 and age 14 in a population survey of 2,941 Finnish schoolchildren. At age 7, the prevalence of migraines was similar for boys (2.9%) and girls (2.0%), but by age 14, boys had increased to 6.4%, and girls had increased to 14.8%. Unfortunately, there are no large-scale North American epidemiological investigations of headache prevalence in children and adolescents. From these three large-scale epidemiological studies, it can be concluded that childhood headaches are common.

Despite the prevalence of childhood and adolescent headaches, no headache classification system specific to children has been developed, probably because of children's inability to clearly describe and localize their headaches, and because of the belief that, with few exceptions, chronic childhood headaches are thought to be similar to adult headaches (Barlow, 1984; Hoelscher & Lichstein, 1984; Saper, 1983). The most frequently used adult-headache-classification system is that provided by the Ad Hoc Committee on Classification of Headache (Friedman, 1962). Although the classification system describes 15 categories of headache types, only 4 are discussed here in any detail because they are seen more frequently clinically, and because psychological factors have been indicated in their etiology. The four headache categories are migraine, muscle-contraction, combined migraine–muscle-contraction, and psychogenic (i.e., hypochondriacal, conversion, or delusional).

### *Migraine Headache*

Interest in childhood and adolescent headaches—migraine headache, in particular—has increased substantially, as indicated by a recent survey of published sources on the topic (Barlow, 1984; Dalessio, 1980; Gascon, 1984; Hoelscher & Lichstein, 1984; Rothner, 1983; Saper, 1983; Shinnar & D'Souza, 1981; Thompson, 1980). Migraine headache is a vascular disorder characterized by recurrent attacks of pulsating head pain with widely varying symptomatology. Prodromal and concurrent symptoms include unilateral, retro-orbital, or fronto-temporal pain, usually associated with nausea, vomiting, anorexia, abdominal pain, pallor, sweating, phonophobia, and photophobia. The headache episodes may occur at any time of the day but are usually common at awakening. The average age of onset is approximately 7, with a range of 18 months to 14 years (Bille, 1962). The frequency of migraine headaches varies from several times a week to several times a year. The duration is usually from 30 minutes to several hours but may last several days at a time. A higher incidence of motion sickness, bilious attacks, eczema, and sleep-related disturbances (e.g., bed-wetting and

nightmares) than in the general child population has been noted (Prensky, 1976; Waters, 1972). Compared to adults who have migraines, children tend to experience migraine headaches that are more frequent, that have a shorter duration, and that are accompanied by greater gastrointestinal distress (Barlow, 1984; Hoelscher & Lichstein, 1984; Saper, 1983).

Several different types of migraine headaches (i.e., classic, common, cluster, complicated, and migraine variants) are commonly seen in children and adolescents. Classic migraine is identified by the characteristic presence of conspicuous, transient visual auras (e.g., scintillating scotomas and flashing lights) and sensory and/or motor disturbances (e.g., micropsia, macropsia, tinnitus, lightheadedness, and numbness in the extremities) during the prodrome (Barlow, 1984; Gascon, 1984; Hoelscher & Lichstein, 1984; Thompson, 1980). Following the prodromal period (approximately 10–30 minutes before a headache), a classic migraine usually manifests itself unilaterally, with associated symptoms of nausea and vomiting. Gascon (1984) indicated that the expression of classic migraine is more frequent in adolescence than in preadolescence, but again, children may have difficulties in recognizing and describing prodromal signs.

Common migraine headaches are characterized by the absence of a clear-cut prodrome or aura, and the location of the pain is likely to be bilateral and of longer duration than in classic migraine headaches (Thompson, 1980). Nausea and vomiting may or may not be present during the headache episode.

Cluster migraine headaches are defined by unexpected bouts of severe headaches, usually in clusters of two or three 20 to 90-minute headache episodes over several days (Barlow, 1984; Gascon, 1984). Cluster migraine headaches are often unilateral and located orbitally. Clusters of headaches are usually followed by periods of remission of one month or more. This form of migraine headache is rarely seen in children (Curless, 1982; Dalessio, 1980; Thompson, 1980).

Complicated migraines (e.g., hemiplegic, ophthalmoplegic, basilar artery, acute confusional states, and Alice in Wonderland) are headaches accompanied by strong focal neurological deficits (Gascon, 1984; Shinnar & D'Souza, 1981; Thompson, 1980). Prensky (1976) noted that these forms of complicated migraine headaches occur more frequently in children than in adults.

Migraine variants represent a constellation of periodic symptoms that are associated with childhood migraines but that do not involve actual head pain. (Gascon, 1984; Prensky, 1976; Shinnar & D'Souza, 1981; Thompson, 1980). These migraine variants include cyclical vomiting, benign paroxysmal vertigo, and abdominal migraine. The physical disturbances may alternate with migraine headaches and/or may be replaced by migraine in later life.

Although the pathophysiology of migraine headaches has been well established, the etiology remains uncertain. As proposed by Wolff (Dalessio, 1980), the pathophysiology of migraine headache involves two phases. The initial phase (prodrome) consists of a vasoconstriction of the intracranial and extracranial arteries induced by sympathetic nervous system action. Following this initial phase, the second phase is characterized by vasodilation, particularly of the extracranial arteries, which results in the pain. What exactly initiates this two-phase sequence is not known, but psychological (e.g., migraine person-



ality), environmental (e.g., stress), neurovascular, (e.g., platelet aggregation and amines), hormonal (e.g., estrogen and progesterone) causes have been proposed (Adams, Feuerstein, & Fowler, 1980; Barlow, 1984; Dalessio, 1980; Saper, 1983; Thompson, 1980). It is unlikely that any one factor is responsible, and more research is needed to elucidate the precise nature of the etiology of migraine headache.

### *Muscle-Contraction Headache*

Muscle-contraction headache, also known as *tension headache*, results from sustained contraction of the muscles of shoulders, neck, and scalp (Friedman, 1962; Gascon, 1984; Green, 1983; Thompson, 1980). A sensation of tightness or pressure in a "hat-band"-like distribution is commonly reported. Muscle-contraction headaches last for a few hours up to weeks, with varying degrees of intensity, but usually do not interrupt regular daily activities. Pain is usually located bilaterally and is described as dull (as opposed to the throbbing of migraine headaches). Muscle-contraction headaches have no prodrome, but nausea, vomiting, and dizziness may occur concurrently (Green, 1983). It should be pointed out, however, that some controversy exists over the frequency of childhood muscle-contraction headaches. Based mostly on clinical impression, Green (1983) and Shinnar and D'Souza (1981) have reported that muscle-contraction headache is the most common type of headache, whereas Jay and Tomasi (1981) and Thompson (1980) have indicated that this type of headache is relatively infrequent. It is interesting that, in the child and adolescent headache literature, muscle-contraction headache has received less attention than psychogenic headache, whereas in the adult literature, the reverse is true. This current situation probably has to do with the confusion of and lack of knowledge about diagnostic categories.

Although a sustained contraction of shoulders, neck, and scalp muscles appears to be the pathophysiological mechanism, emotional factors (e.g., school and family conflict) have been suspected as playing a significant role in the etiology of muscle-contraction headache (Dalessio, 1980; Thompson, 1980). Despite the association between muscle-contraction headache and emotional factors, no evidence to support a direct cause-and-effect relationship has been established.

### *Combined Migraine–Muscle-Contraction Headache*

Combined migraine–muscle-contraction headache, also known as *mixed headache*, is characterized by the expression of both vascular and muscular symptoms in a headache episode. This headache category has received no empirical attention, much less any consideration in childhood headache review papers. This state of affairs is not surprising, as this type of headache has only relatively recently been recognized as a valid separate diagnostic headache category (Blanchard & Andrasik, 1982).

## *Psychogenic Headache*

The Ad Hoc Committee on the Classification of Headache (Friedman, 1962) listed a major subgroup of headaches as conversion, hypochondriacal, or delusional. The pain mechanism is assumed to be psychological, and there are no known peripheral physiological characteristics. This type of headache is very similar to a pain disorder described in the DSM-III as psychogenic pain disorder; hence, the term *psychogenic headache* is more appropriate for descriptive and diagnostic purposes.

The relative prevalence of psychogenic headaches is not clear. Again, based on clinical impression, Rothner (1979) indicated that psychogenic headaches are most common in children and adolescents, whereas Prensky (1976) and Thompson (1930) noted its infrequency. The controversy about the prevalence of both psychogenic and muscle-contraction headaches has to do with whether these two headache types are one and the same (Thompson, 1980) or two separate categories (Gascon, 1984; Green, 1983; Rothner, 1979; Shinnar & D'Souza, 1931).

Psychogenic headaches tend to be relatively continuous in occurrence, with a waxing and waning quality, and are often described as a dull pain located frontally or posteriorly (Barlow, 1984). Associated symptoms include anxiety and depression (Barlow, 1980; Green, 1983; Shinnar & D'Souza, 1981).

Fordyce (1976) suggested that psychological factors have a role in the maintenance of pain behavior; that is, through the environment, pain behavior is positively reinforced and "well" behavior is inadequately reinforced. Therefore, psychogenic headache can be viewed as a pain disorder reinforced by its consequences without the known peripheral pain mechanisms that are typical of migraine or muscle-contraction headaches. The possible mechanism in the acquisition of psychogenic headache involves inappropriate positive reinforcement, modeling, and/or avoidance conditioning.

## *Assessment*

A differential diagnosis of headache types in children and adolescents involves the elimination of alternative physical, physiological, and psychological explanations of head pain (Barlow, 1984; Gascon, 1984; Hoelscher & Lichstein, 1984; Saper, 1983; Shinnar & D'Souza, 1981; Thompson, 1980). A comprehensive headache assessment requires collecting information from several sources:

1. An adequate medical examination.
2. A thorough interview that gathers data from both the child and the parents on the developmental history, the parameters, and the antecedents and consequences of head pain.
3. Having the child self-monitor head pain behavior.
4. Performing a psychophysiological assessment.

The medical diagnosis of a headache type is made on the basis of behavioral symptoms and positive or negative findings on a series of medical tests (Gascon,

1984; Shinnar & D'Souza, 1981; Thompson, 1900). A physical examination includes blood pressure, size of cranium, cranial auscultation, eye function, cranial nerve function, and general sensory and motor function. Also included in a thorough examination are laboratory studies, if indicated (e.g., blood and urine analysis, skull X rays, computerized tomography study, angiogram, and EEG). A medical examination that rules out intracranial pathology is warranted because 5%–13% of children experience chronic headaches that are secondary to neurological disease, such as tumors, hematomas, and cranial neuralgias (Illingworth, 1975; Koch & Melchior, 1969).

Prensky (1976) stated that another reason for a medical examination is to properly diagnose and manage forms of complicated migraine and, in particular, to differentiate child migraine from epilepsy. Shinnar and D'Souza (1981) indicated that the difficulty in differentiating migraine from epilepsy has to do with the presence of symptoms that are common to both (e.g., auras, nausea, pallor, drowsy postictal state, confusion, transient focal neurological deficits, and response to anticonvulsants). Several differences between migraine and epilepsy have been noted (Shinnar & D'Souza, 1981). Individuals with migraine headaches usually have a positive family history of migraine (70%–90%) and a negative history of seizures. Also, a loss of consciousness occurs during migraine headaches only rarely but is typical during seizures. Furthermore, the duration of migraines tends to be measured from 30 minutes to a day, whereas seizures are measured in seconds to minutes. Paroxysmal EEG is unusual for migraines and is common during seizures. A further discussion of the procedures used in the medical examination of headaches has been provided by Ryan and Ryan (1978).

The critical areas to be assessed in the psychological interview include a detailed listing of headache and other chronic pain, a detailed medical history of head pain and the treatments received, and an evaluation of the child's psychological adjustment in order to construct a functional analysis of head pain and other psychological difficulties that may be present (Hoelscher & Lichstein, 1984). Hoelscher and Lichstein (1984) stated that, although the interview is of value in gathering information, the reliability of self-report by children and parents remains unknown. With this caution in mind, we describe here aspects of the interview that will aid in the differential diagnosis of head pain.

Children with head pain often show a strong positive family history. It has been observed that 70%–90% (the percentages for other types of headache are unknown) of children with migraine headaches have a family history of the disorder (Bille, 1962; Congdon & Forsythe, 1979; Prensky, 1976). Because a strong family history has been observed in children with migraine headaches, Barlow (1984) indicated that caution is especially warranted to rule out more serious organic pathology when a family history of migraine cannot be developed for a child who appears to have migraines.

In an excellent review paper, Gascon (1934) provided a useful framework for the interpretation of headache parameters (i.e., lateralness of pain, pain site, quality of pain, duration, time of onset, and associated symptoms). Headaches that tend to be bilateral are usually muscle-contraction or common migraine headaches. If a headache is unilateral first and eventually becomes bilateral,

classic migraine is suggested. A headache with no specific location (i.e., "it hurts all over") is usually a psychogenic headache. Head pain located at the forehead or bifrontally may point to a common migraine, a classic migraine is characterized by frontotemporal pain, and muscle-contraction head pain is usually situated bifrontally, at the vertex, or bioccipitally. A headache located over the face could be due to sinusitis or temporal mandibular joint pain. Classically, migraine and muscle-contraction headaches are described as throbbing and dull, respectively. If the child reports a headache that is severe but does not appear to be distressed by it, a psychogenic headache may be suggested.

Migraine and muscle-contraction headaches tend to last anywhere from several hours to days, whereas psychogenic headaches are often described as "always there." The time of onset of migraine headaches is often on awakening (note that children with headaches due to hypertension or minor intracranial pressure or secondary to bruxism often wake up with headaches), whereas muscle-contraction headaches usually occur several hours after waking and get worse as the day progresses. Associated symptoms such as nausea, vomiting, and motion sickness usually indicate migraine headaches.

Because both physical and psychological stress have been implicated in the etiology, exacerbation, and/or maintenance of childhood and adolescent headaches (Barlow, 1984; Bille, 1962; Dalessio, 1980; Gascon, 1984; Saper, 1983; Thompson, 1980), sources of possible stress need to be assessed. Bille (1962) noted that physical stress, such as exercise, eye strain, fatigue, and hunger, can trigger headaches in children. However, more important, he added that psychological stress due to school demands and conflicts at home accounted for over 50% of all migraine attacks in his headache sample. However, as Hoelscher and Lichstein (1984) pointed out, no acceptable methodology or study has yet been designed to directly investigate the presumed relationship between psychological stress and headaches.

Children experiencing headaches have also been thought to exhibit a certain personality profile (Barlow, 1984; Green, 1982; Hoelscher & Lichstein, 1984; Saper, 1983). Based on anecdotal impressions, children with chronic headaches have been described as shy, sensitive, neat and tidy, overconscientious, prone to worry, anxious, and perfectionistic. Although this personality profile may be intuitively appealing, it still requires empirical validation.

As headaches in children can present themselves alone as a pain state or as part of a psychological state or both, it is necessary to rule out other possible psychological disorders (i.e., DSM-III overanxious disorder, separation anxiety disorder, school phobia, depression, and psychogenic disorder). The headache personality profile described earlier resembles the DSM-III criteria for overanxious disorder. One particular criterion, "somatic complaints such as headaches or stomachaches, for which no physical basis can be established" (p. 57.), can be used to rule out migraine and muscle-contraction headaches. Differentiating psychogenic headaches from overanxious disorder can be a problem. If headaches appear to be functional and are part of an anxiety symptom complex, overanxious disorder is indicated. Children may use headaches to avoid school because of a fear of school, as in simple phobia, or to remain close to an attach-

ment figure, as in separation anxiety disorder. Children presenting with headaches should also be assessed for childhood depression (Ling, Oftedal, & Weinberg, 1970). If a child experiencing headaches exhibits a decrease in vigor, changes in appetite, sleep disturbances, changes in mood, and loss of interest in usual activities, childhood depression should be suspected. If the functional analysis of headaches indicates high secondary gain, a diagnosis of psychogenic pain disorder may be correct.

Although self-monitoring of headache activity is one of the most frequently used methods of quantifying headache parameters, it has been less commonly used with children. Descriptions of headache activity often come from parents and from medical and school records rather than from the children themselves (Hoelscher & Lichstein, 1984). Typically, children are required to record their headache severity, location, duration, the disability caused, the associated physical symptoms, the type and amount of medication taken, and possible headache triggers or stressors (see Joffe, Bakal, & Kaganov, 1982, for a headache diary sample). The advantages of using a headache diary are these: a diary provides data that are more objective and reliable than global self-report measures; it allows the establishment of baseline levels and assessment for treatment effectiveness; and it records the functional relationships between the antecedents and consequences of headache behavior. Unfortunately, no data in the literature are available on the reliability of headache diaries compiled by children or adolescents (Hoelscher & Lichstein, 1984).

Psychophysiological recording as part of the assessment procedure has rarely been used with children, except in treatment studies. Assessment of baseline levels of physiological activity (e.g., frontalis and/or trapezius electromyography, forehead or finger skin temperature, or cephalic blood volume pulse) is important for diagnostic purposes and for evaluation of treatment efficacy. A physiological assessment of a child in both a nonheadache and a headache state should help to differentiate psychogenic headaches (i.e., no physiological differences between nonheadache and headache states) from migraine or muscle-contraction headaches. As the physiological differences between migraine and muscle-contraction headaches have not been convincing in the adult literature (Andrasik, Blanchard, Arena, Saunders, & Barron, 1982), differentiating these two kinds of headaches physiologically in children may be equivocal. Differentiating migraines from muscle-contraction headaches physiologically remains an empirical task that has not been addressed.

Clearly, despite the ubiquity of headaches in children and adolescents, there are surprisingly few data on the assessment of headaches. At this time, the differential diagnosis of headache rests mostly on medical procedures and a thorough interview. Obviously, more research is required to validate the use of self-monitoring and physiological recordings in the assessment of headaches in children and adolescents.

## SEIZURE DISORDERS

Epilepsy is a common neurological disorder. It has been estimated that 1%–2% of the American population suffers from the condition (Epilepsy Foundation

of American, 1975). In addition to its pervasiveness, epilepsy costs the U.S. government some \$4.4 billion annually (e.g., in welfare, social security, disability payments, special education, and vocational rehabilitation). On a more personal level, epilepsy has neurological, psychological, behavioral, and environmental implications for the child and adolescent.

Epilepsy is a complex neurological disorder with a wide spectrum of clinical manifestations, and as a result, deriving a simple and precise definition of epilepsy is a difficult task. Symptomatic of a CNS disorder, epilepsy—or more accurately, the epilepsies—in and of themselves are not a disease (Mostofsky & Iguchi, 1982). The term *epilepsy* implies recurrent, paroxysmal, uncontrolled, excessive discharge of cerebral neurons, resulting in clinical signs and symptoms that interfere with the normal levels or the quality of an individual's behavior (Browne & Feldman, 1983; Strub & Black, 1981).

Several terms describing various aspects of the seizure experience need to be reviewed before we discuss the classification of seizures (Browne & Feldman, 1983; Strub & Black, 1981). The period in which the seizure actually occurs is called the *ictal period*. *Preictal* and *postictal* refer to the time before and after the seizure. The *interictal period* refers to the interval between actual seizures. An aura denotes the actual onset of the seizure and is recognized as an aspect of the seizure itself.

Several classification systems have been used. The most commonly accepted and frequently used classification system was developed by the International Classification against Epilepsy and led to the International Classification of Epilepsy (Gastaut, 1970). This classification has been updated by Dreifuss (1981; see Table 1). This classification system classifies seizures as a single event and is based on three factors: (1) clinical seizure type; (2) EEG seizure type; and (3) EEG interictal expression. This discussion deals mostly with clinical seizure types, and readers are directed to Henry (1980), Kiloh, McComas, and Osselton (1972), and Riley (1983) for a detailed discussion of the EEG in the evaluation and management of epilepsy.

The advantages of this classification system are that it was written by experts in the field, that it is widely recognized and endorsed by other epilepsy federations and societies (e.g., the World Federation of Neurology and the International Federation of Societies for Electroencephalography and Clinical Neurology), and that it provides a uniform standard facilitating communication between clinicians and scientists (Browne, 1983). One disadvantage of this classification system is that the diagnostic terms used are different from those used by most clinicians (e.g., *tonic-clonic* is used instead of *grand mal*). Another major difficulty is that this classification system fails to specify anatomical substrates, etiology, age of onset, seizure frequency, modifying and precipitating factors. Finally, this classification system requires heavy reliance on EEG data, which may not always be available (Browne, 1983). For a review of this classification and other classification systems used in the diagnosis of epilepsy, see Maslund (1974).

Although a detailed review of the different epilepsies is beyond the scope of this chapter, a brief description of the different types will be given. As the reader will note from Table 1, the partial (focal, local) seizures make up the first major

TABLE 1. International Classification of Epileptic Seizures<sup>a</sup>

- 
- I. Partial seizures (seizures beginning locally)
    - A. Partial seizures with elementary symptomatology (generally without impairment of consciousness)
      - 1. With motor symptoms (includes Jacksonian seizures)
      - 2. With special sensory or somatosensory symptoms
      - 3. With autonomic symptoms
      - 4. Compound forms
    - B. Partial seizures with complex symptomatology (generally with impairment of consciousness) (temporal lobe or psychomotor seizures)
      - 1. With impairment of consciousness only
      - 2. With cognitive symptomatology
      - 3. With affective symptomatology
      - 4. With "psychosensory" symptomatology
      - 5. With "psychomotor" symptomatology (automatisms)
      - 6. Compound forms
    - C. Partial seizures secondarily generalized
  - II. Generalized seizures (bilaterally symmetrical and without local onset)
    - 1. Absences (*petit mal*)
    - 2. Bilateral massive epileptic myoclonus
    - 3. Infantile spasms
    - 4. Clonic seizures
    - 5. Tonic seizures
    - 6. Tonic-clonic seizures (*grand mal*)
    - 7. Atonic seizures
    - 8. Akinetic seizures
  - III. Unclassified epileptic seizures (unclassified because of incomplete data)
  - IV. Addendum (repeated seizures occurring under a variety of circumstances, e.g., due to alcohol, fatigue, emotional strain, and so on)
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<sup>a</sup>Table is modified from "Proposal for Revised Clinical and Electroencephalographic Classification of Epileptic Seizures" by F. E. Dreifuss, *Epilepsia*, 1981, 22, 409-501.

category of epileptic seizures (Dreifuss, 1981). The partial seizures are further subdivided into three major subgroups: (1) simple partial seizures; (2) complex partial seizures; and (3) partial seizures evolving into generalized tonic-clonic convulsions. Simple partial seizures are caused by local cortical discharges with no impairment of consciousness. Simple partial seizures can consist of motor (e.g., Jacksonian march, postural, and phonatory), somatosensory (e.g., visual, auditory, and gustatory), autonomic (e.g., sweating, pallor, and pupillary dilation), and psychic (e.g., *deja vu*, dreaming states, *macropsia*, fear, and anger) symptoms. The major distinction between simple partial and complex partial seizures is that there is a loss of consciousness in the latter.

Complex partial seizures (Dreifuss, 1981) usually have bilateral hemispheric involvement. Complex partial seizures may start as a simple partial seizure with associated features, eventually leading to impaired consciousness, or may be accompanied by automatisms. Automatisms are nonreflex actions that are performed "automatically" without conscious awareness and of which the individual has no recollection (Penry, Porter, & Dreifuss, 1975). Automatisms may appear as lip smacking, chewing, grimacing, yawning, fumbling of the fingers,

and so on. The third subgroup of partial seizures consist of partial seizures that eventually spread to become generalized seizures.

The generalized seizures (convulsive and nonconvulsive) make up the second major class of seizures (Dreifuss, 1981). This class of seizures initially involves both hemispheres, and impairment of consciousness may be manifested. There are six different types of generalized seizures: absence, myoclonic, clonic, tonic, tonic-clonic, and atonic.

The essential features of the absence seizure (what used to be called *petit mal*) are suddenness of onset, interruption of ongoing activities, blank stare, and possibly brief upward rotation of the eyes (Penry *et al.*, 1975). This decrease in responsiveness may be accompanied by impairment of consciousness, with mild clonic (i.e., alternate contraction and relaxation of muscles), tonic (i.e., sustained muscular contraction), or atonic (i.e., without muscular tone or tension) components, with automatisms and autonomic symptoms. These associated symptoms can occur singly or in combination. Absence seizures last about 5–10 seconds. A typical absence is a seizure in which the individual's responsiveness is decreased but not completely abolished, and the onset and cessation are not as sudden.

Myoclonic seizures are characterized by muscular jerks (single or multiple) that have a sudden onset, and that are brief in duration; the spasticlike contractions may be confined to one area or several areas of the body (Dreifuss, 1981). Myoclonic seizures occur most frequently before going to sleep or on awakening.

Tonic-clonic seizures consist of an initial increase in muscle tone (tonic phase) resulting in the individual's falling to the ground (Dreifuss, 1981). Respiration difficulties, cyanosis, biting of the tongue, and passing of urine may occur during the tonic phase. Following the tonic phase, clonic convulsive movements occur for a variable amount of time. Cyanosis and frothing from the mouth may be present during the clonic phase. After the clonic phase, the individual usually falls asleep. Clonic and tonic seizures are characterized predominantly by the presence of one phase of the tonic-clonic cycle.

Atonic seizures (drop attacks) can be described as a sudden, brief loss in postural muscle tone (e.g., head, neck, trunk, and legs) causing the individual to fall to the ground (Dreifuss, 1981). An atonic seizure lasts 1–4 seconds. There is usually no loss of consciousness, aura, or postictal confusion.

The third major category is made up of seizures that cannot be classified because of a lack of data or because of atypicalness (Dreifuss, 1981). This category basically represents a "waste basket." Finally, Dreifuss (1981), in his update of the classification of epileptic seizures, provided an addendum describing repeated seizures occurring under a variety of circumstances (e.g., cyclic attacks, attacks provoked by alcohol or fatigue, or attacks that occur for no apparent reason). Prolonged repeated seizures in which there is no recovery between attacks is referred to as *status epilepticus*.

There are other types of seizures (e.g., infantile spasms and Lennox-Gastaut syndrome) not described in the International Classification of Epilepsy but that have received considerable attention because of their association with mental retardation (Brett, 1983). Infantile spasms or West syndrome are characterized



by sudden, brief, flexion of the neck and trunk, and raising of both arms forward or sideways, sometimes with flexion of the elbows and knees. Often, a cry is associated with the attacks. The onset of infantile spasms usually occurs within the first year of age. Brett (1983) indicated that some 70%–96% of children with infantile spasms also have mental retardation. Delays are noted most in the area of social and personal abilities. The outcome of infantile spasms in a child is severe subnormality, little or no verbal ability, hyperactivity, a need for constant attention, and the presence of autistic traits and mannerisms (Brett, 1983). The Lennox-Gastaut syndrome, which is present in 10% of all children with epilepsy (Gastaut, Gastaut, Goncalves e Silva, & Sanchez, 1975), is characterized by atypical absence and myoclonic, atonic, and tonic symptomatology. Mental retardation and neurological deficits have ranged from 47% to 96% and 30% to 75%, respectively, in children with Lennox-Gastaut syndrome (Erba & Browne, 1983).

A cursory review of different types of seizure disorders has been provided. For further details on seizure disorders, see Browne and Feldman (1983) and Dreifuss (1983).

Much of the information on the incidence and prevalence of epilepsy has been provided by Hauser and Kurland (1975). These investigators conducted their epidemiological study in Rochester, Minnesota, from 1935 to 1967. The incidence of epilepsy by seizure type indicated that the mean annual rate per 100,000 population was highest for simple partial seizures (12.8), followed by tonic-clonic (12.5) and complex partial seizures (10.4). The incidence of epilepsy by age indicated that partial seizures occur most frequently in the first years of life and after 60 years of age, with a decrease from 10 to 50 years of age. Tonic-clonic seizures do not vary much with age, whereas absence seizures rarely occur after age 20. The incidence of "incomplete convulsive" seizures was highest during the first year of life and decreased substantially after 5 years of age. A study by Gastaut *et al.* (1975) indicated that, in 2,161 children and adolescents (less than 15 years of age) with epilepsy, 10.4% had tonic-clonic, 17.8% absence, 3.7% myoclonic, 10.2% Lennox-Gastaut syndrome, 2.8% infantile spasms, 45% simple partial, and 21.4% complex partial seizures.

Though the causes of seizure disorders are multiple and vary from case to case and within the individual, the etiology of epilepsy remains largely speculative. Genetics has been thought to play a role, but the evidence has been inconclusive (Newmark & Penry, 1980). Brain tumors, cerebrovascular diseases, metabolic and endocrine factors, and trauma have all been implicated in the etiology of epilepsy (Browne & Feldman, 1983; Vinken & Bruyn, 1974; Yang, Berger, Cohen, & Duffner, 1979). Flashing lights, fever, sleep deprivation, stress, reading, withdrawal of medication, emotional factors, and sensory stimuli have been known to trigger seizures (Brett, 1983). Balaschak and Mostofsky (1981) reviewed several psychological theories (i.e., psychoanalytic formulations, emotional precipitants, psychosomatic theory, and learning theories) and concluded that none of these theories provided a comprehensive explanation of seizure disorders.

## *Assessment*

Because of the multifaceted symptomatology of seizure disorders, a broad-based assessment of epilepsy is a necessity and represents a major challenge to the behavioral clinician. Balaschak and Mostofsky (1981) described a useful assessment checklist, including an appraisal of the physiological, psychological, and environmental domains of the epileptic child.

An assessment of the physiological domain requires a thorough medical examination that attempts to diagnose the possible neurological, cerebrovascular, infectious, traumatic, metabolic, and the endocrinic etiology of seizure disorders. The medical workup includes a basic neurological evaluation, a detailed medical and genetic history, skull X rays, computerized axial tomography, serum and hormonal determinations, cranial nerve function, electroencephalography, and other more invasive tests if indicated (Balaschak & Mostofsky, 1981; Brett, 1983; Strub & Black, 1981).

As Balaschak and Mostofsky (1981) pointed out, although the medical workup is the primary form of assessment, it does not provide any information regarding how cognitive, behavioral, and psychosocial functions are affected by seizures; in other words, the psychological and environmental domains.

The evidence of cognitive deficits in epileptics is extensive. Tartar (1972) reviewed 16 studies that spanned 50 years and provided some of the following conclusions: epileptics have a slightly lower mean IQ than is in the normal population; epileptics of known etiology have a lower IQ than epileptics with unknown etiology; institutionalized epileptics have a lower IQ than noninstitutionalized epileptics; the higher the premorbid IQ, the greater the deterioration; the earlier the onset and the longer the duration of the disorder, the lower the IQ; and except for petit mal seizures (i.e., absence seizures), IQ is negatively correlated with the total number of seizures. These conclusions on the data should be accepted cautiously because of the number of confounding methodological problems in much of the first few decades of research. However, more recent investigations have continued to note the preponderance of cognitive deficits in epileptic children and adolescents (Holdsworth & Whitmore, 1974; O'Leary, Lowell, Sackellares, Berent, Giordani, Seidenburg, & Ball, 1983; Stores, 1978).

The Wechsler Intelligence Scale for Children and the Stanford-Binet are the two main intellectual assessment tests. There are no standard psychological instruments specifically for epileptic children; therefore, scores on standard IQ tests should be interpreted cautiously (Balaschak & Mostofsky, 1981). These authors have also added that IQ tests should not be used indiscriminately because an individual has seizures but should be administered if learning problems, mental retardation, or organic pathology is suspected.

In several studies it has been reported that children with epilepsy have higher rates of psychiatric disturbances. In the well-known Isle of Wight study, Rutter, Graham, and Yule (1970) reported that children with epilepsy were five times more likely to have psychiatric disturbances than the general population

and three times greater than children with nonepileptic brain injuries. Holdsworth and Whitmore (1974) indicated that, based on teacher ratings, 21.1% of 85 children with epilepsy exhibited deviant behavior. Hoare (1984a) compared psychiatric disturbances in a newly diagnosed epileptic group, one group with chronic epilepsy, two similarly composed diabetic groups, and a normal control group. He indicated that there were significantly greater psychiatric disturbances in children with chronic epilepsy than in a chronic diabetes group and in children in the general population as measured by Rutter's Parent and Teacher Rating Scales. Hoare (1984b) observed that parents of epileptics and diabetics were no more disturbed than adults in the general population, but that there was a relationship between disturbance in a chronic epileptic group and increased psychiatric morbidity among their mothers. Psychiatric disturbances in epileptics have been associated especially with temporal lobe epilepsy or, in current terminology, complex partial seizures (Hoare, 1984a; Lindsay, Ounstead, & Richards, 1979; Rutter *et al.*, 1970; Stevens & Herman, 1981; Stores, 1978).

Epilepsy has also been associated with psychosocial dysfunction. Richardson and Friedman (1974) evaluated psychosocial problems in adolescent patients with epilepsy and observed that difficulties with peers, significant restrictions in social life and athletic activities, and poor school performance were prominent. Also, familial concerns about and reactions to epilepsy contributed to psychosocial difficulties experienced by the epileptic child. In a study by Harrison and Taylor (1976), 200 children out of an original sample of 638 were followed for a period of 25 years. The investigators concluded that continuing epilepsy was associated with greatly reduced educational and occupational achievement compared to that of a group of epileptics in remission.

The interview is the preferred method of assessing the psychological and environmental domains of the epileptic child. In an attempt to be specific to epilepsy and to provide information that may be missed in a standardized diagnostic interview, Balaschak and Mostofsky (1981) developed three paper-and-pencil inventories. The Seizure Disorder Survey Schedule was designed to provide standardized sociofamilial information; a detailed description of clinical seizure phenomena; possible triggers of seizures; medical, surgical, and drug histories; behavioral problems (e.g., enuresis and phobias); psychometric results; and clinical impressions. This inventory is usually filled out by the parent, but the epileptic adolescent should also be encouraged to complete the inventory. The Pre-Behavioral Treatment Questionnaire attempts to elicit the epileptic's understanding of his or her disorder and the potential secondary gain value that the seizures may have. Finally, the Weekly Chart requires the parent and the child to record the frequency, the duration, the severity, the onset, the interference in activities, and the precipitants of seizures. The reader is referred to Balaschak and Mostofsky (1981) for further details and samples of these inventories. Although the use of these inventories appears promising, their validity and reliability require further evaluation.

Other paper-and-pencil tests that have been used for research on epileptics and that should be part of the standard assessment are parent and teacher rating

scales. The rating scales can provide information on the behavioral topography of the epileptic child as rated by different sources and across different settings.

Given the multifaceted symptomatology of epilepsy, the differential diagnosis of epilepsy from other medical and psychiatric disorders can be difficult. Following is a discussion of selected major medical and psychiatric disorders that need to be eliminated in the differential diagnosis of epilepsy.

Although the differential diagnosis of various types of seizure disorders and other medical disorders is likely to be done by a neurologist or a pediatrician, the behavioral clinician should still be familiar with these diagnostic considerations. To differentiate the various types of seizure disorders (e.g., absence seizures vs. complex partial seizures, single partial seizures vs. complex partial seizures, and tonic-clonic seizures vs. tonic seizures), the reader is encouraged to review the earlier discussion of seizure types provided in this section and to examine the following sources for further details: Browne and Feldman (1983), Dreifuss (1983), and Vinken and Bruyn (1974).

One type of seizure not already discussed that requires consideration is the pseudoseizure. Pseudoseizures are characterized by several features (Brett, 1983; Feldman, 1983): (1) pseudoseizures usually occur in emotionally laden situations; (2) symptomatology of attacks varies from stereotypical to variable and is easily affected by the environment; (3) attacks have a gradual onset and prolonged resolution; (4) incontinence may occur; (5) self-injury is rare; (6) epilepsy may be present in the family; (7) there may be apparent amnesia about the attacks; (8) denial and unwillingness to consider motivational determinants and secondary gain can often be identified; and (9) a normal interictal EEG is common. Epileptic attacks usually occur in neutral settings; the symptoms of attacks tend to be stereotyped with minor variations among attacks; attacks have an abrupt onset and ending; incontinence usually occurs during the attacks; and self-injury is common. Other features of epileptic attacks include a moderate to strong family history of epilepsy, individuals' having fragmentary recollection of the attacks or no recall at all, a desire by individuals to know about their attacks, usually absence of secondary gain, and, commonly, an abnormal interictal EEG. The differential diagnosis of pseudoseizures and seizures is further compounded by the observation that individuals with pseudoseizures can also experience epileptic episodes (Brett, 1983; Feldman, 1983).

Syncope (i.e., fainting) is a medical condition that can easily be mistaken for epilepsy. Jeavons (1983) observed that as many as 35 patients (children and adults) with syncope out of 470 were misdiagnosed as having epilepsy. The differential diagnosis between syncope and epilepsy (in particular, simple partial seizures, complex partial seizures, and tonic-clonic seizures) can be made according to several features: syncopal attacks are characterized by flaccid muscle tone; the attacks last approximately 10 seconds; they rarely occur during sleep; incontinence is very infrequently present; skin color is pale; respiration is slow, unless syncope is due to hyperventilation; the EEG is nonspecific; and the EKG is abnormal (Brett, 1983; Feldman, 1983). On the other hand, seizures are characterized by increased muscle tone, episodes lasting 10 seconds (e.g., absence seizure) to 3 minutes (e.g., tonic-clonic seizures), episodes that may occur

during sleep or after sleep deprivation, frequent occurrence of incontinence, flushed skin color, stertorous breathing, specific paroxysmal EEG, and, commonly, a normal EKG during episodes.

Migraine is another medical disorder deserving attention in the differential diagnosis of epilepsy (e.g., simple and complex partial seizures). (See the differential diagnosis of migraine and epilepsy in the headache section of this chapter.)

Some of the behavioral symptomatology of epilepsy closely resembles behavioral disturbances noted in psychiatric disorders (e.g., psychosis, mental retardation, attention deficit disorder with or without hyperactivity, and conduct disorders). Complex partial seizures may be mistaken for psychosis. The primary distinguishing feature between the two is that, during a seizure, ideational disturbances, hallucinations, or inappropriate affect occur suddenly, whereas in psychosis, they occur over several days or weeks (Strub & Black, 1981).

Differentiating mental retardation and epilepsy in children is complicated by the observation that mental retardation occurs in one-third of the children with epilepsy (Brett, 1983). The difficulty in separating the two has to do with whether epilepsy and mental retardation are part of the same etiological process (e.g., brain damage) or whether one condition causes the other.

Because of the considerable overlap in the presentation of learning and behavior disturbances in children with epilepsy, attention deficit disorder, or conduct disorder, the differential diagnosis among the three can be very difficult. For example, absence seizures occurring in the classroom can sometimes be mistaken for the inattentive behavior characteristic in attention deficit disorder. As a result of taking medication for the control of seizures, a child may appear to be mentally sluggish, a reaction that can be mistaken for a feature of attention deficit disorder. In a final example, children with complex partial seizures may exhibit aggressive or violent behavior that resembles the behavioral patterns of conduct disorder. Obviously, the differential diagnosis among these disorders relies heavily on a thorough medical evaluation, a complete interview, and a detailed functional analysis of the child's behavior.

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# 18      *Eating and Elimination Disorders*

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Eating and eliminating disorders are among the most common problems of children and adolescents treated in pediatric outpatient settings (Christophersen & Rapoff, 1979). The most common eating disorders of infancy and early childhood are failure to thrive and food refusal. Anorexia nervosa, bulimia, and obesity are more frequently seen in later childhood and adolescence. Of the eliminating disorders, enuresis and encopresis are most common and are observed primarily in preschoolers and during the elementary-school years. This chapter addresses the diagnosis and assessment of each of these disorders. Each disorder is described, and assessment strategies for differential diagnosis and treatment outcome are reviewed.

## EATING DISORDERS

### *Anorexia Nervosa and Bulimia*

#### *Clinical Description*

Anorexia nervosa is most often seen in females and involves voluntary restriction of food consumption leading to substantial weight loss. Table 1 summarizes the diagnostic criteria for anorexia and bulimia in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III; American Psychiatric Association, 1980). As shown in Table 1, the DSM-III criteria for anorexia include the loss of at least 25% of body weight, an intense fear of being fat, a distorted body image, and a refusal to maintain an appropriate body weight. Because of their low weight level and nutritional deprivation, anorexics frequently experience amenorrhea and other physical disturbances such as lanugo and bradycardia (Bellack & Williamson, 1982). Furthermore, it is common for anorexics to exercise excessively as they sincerely believe they are fat.

TABLE 1. DSM-III Diagnostic Criteria for Anorexia Nervosa and Bulimia

*Anorexia nervosa*

- A. Intense fear of gaining weight.
- B. Disturbance of body image, or overconcern with feelings of fatness.
- C. Substantial loss (e.g., 25%) of body weight.
- D. Refusal to sustain normal body weight.
- E. No known physical illness that would account for the weight loss.

*Bulimia*

- A. Frequent binge eating.
- B. At least three of the following:
  1. Consumption of high-calorie foods during a binge.
  2. Secretive eating during a binge.
  3. Termination of binging by abdominal pain, sleep, social interruption, or self-induced vomiting.
  4. Recurrent weight-loss attempts by severely restricted diets, self-induced vomiting, or use of cathartics and/or diuretics.
  5. Weight fluctuates by 10 pounds or more due to alternating binges and fasts.
- C. Awareness that the eating pattern is abnormal and fear that eating is out of control.
- D. Depressed mood and self-deprecating thoughts following eating binges.
- E. The bulimic episodes are not due to anorexia nervosa or any known physical disorder.

*Note.* Adapted from *Diagnostic and Statistical Manual of Mental Disorders* (3rd edition) (pp. 69–71) American Psychiatric Association, 1980, Washington, DC.

As shown in Table 1, the main symptoms of bulimia include frequent binge eating, which is accompanied by a fear of losing control over eating and feelings of depression and guilt following binge episodes. Generally, the binge eating consists of consumption of large amounts of high-calorie foods. However, some bulimics report “binge” episodes that consist only of small amounts of “forbidden” foods such as ice cream. These primary symptoms may be accompanied by a variety of other symptoms, such as secretive eating, frequent weight fluctuations greater than 10 pounds, self-induced vomiting, and laxative and diuretic use in order to lose or maintain weight. Although bulimics frequently purge—that is, force themselves to vomit—after binging, the behavior is not an essential characteristic of the DSM-III diagnosis. The bulimic also may suffer from amenorrhea; however, it is less common than in anorexics, as the bulimic is usually within a normal weight range (Nillius, 1983). However, like anorexics, bulimics appear to have a distorted perception of their body (Williamson, Kelley, Davis, Ruggiero, & Blouin, 1985a). Like anorexia, bulimia is seen rarely in males.

*Course of the Disorders*

Anorexia occurs most often in females between the ages of 13 and 20 with 14½ and 18 being the most frequent ages of onset (Halmi, 1974; Halmi, Casper, & Eckert, 1979). Amenorrhea and weight loss may be the first physical signs of anorexia. The disorder usually begins when the individually intentionally loses 5–20 pounds. Subsequently, the individual becomes obsessed with continued weight reduction. Anorexics inevitably describe themselves as fat even though they have become critically underweight. The anorexic’s restrained eating also

may occur in conjunction with sudden or ongoing family stress. If the disorder is left untreated, death can occur as a result of starvation leading to cardiac arrest (Andersen, 1983). Untreated or inadequately treated anorexics sometimes become bulimic, as purging allows for both unrestrained eating and weight maintenance.

Bulimia most often begins between the ages of 15 and 18 (Fairburn & Cooper, 1982; Pyle, Mitchell, & Eckert, 1981). However, the age of onset may range from 13 to 30 (Russell, 1979). A recent survey of high school females between the ages 13 and 19 indicated that 16% engaged in frequent binge eating and 4% used self-induced vomiting as a purgative method (Johnson, Lewis, Love, Stuckey, & Lewis, 1983). Bulimics tend to have a history of being overweight and of binge eating (Fairburn & Cooper, 1982; Halmi, Falk, & Swartz, 1981). The bulimic typically follows binging with purging or short-term fasting.

The adolescent female can discover purging as a weight control method in a variety of ways (e.g., being told of the method by her peers or coincidentally vomiting following a meal because of an illness or overeating). The purging is often performed secretly and can be difficult to detect unless it occurs frequently. Depression and anxiety often accompany bulimia. Depression frequently occurs when the bulimic realizes that she can no longer control her binging and purging. When she attempts to stop the cycle, she experiences weight gain and thus reverts to purging or fasting to lose weight or to maintain her current weight.

The anxiety model of bulimia first proposed by Rosen and Leitenberg (1982) suggests that the disorder is maintained by a cycle of nutritional deprivation and anxiety. An elaboration of this model, illustrated in Figure 1, was presented by Williamson, Kelley, Davis, Ruggiero and Veitia (1985). As shown in Figure 1, the model proposes that frequent purging results in nutritional deprivation and physiological hunger that serve as antecedents to binge eating. Anxiety follows binging because of fear of weight gain, and purging reduces this anxiety. The purging also reinstates the deprivation, and the cycle begins again. Fasting or restrained eating following binges could also result in similar nutritional deprivation and could also serve as a motivator for binge eating. Other problems, such as body image disturbance, interact with the binge-purge behavior in a bidirectional fashion (see Figure 1) and thus exacerbate the eating disorder. This model of bulimia has led to the use of anxiety-based treatment techniques, including exposure with response prevention (Leitenberg, Gross, Peterson & Rosen, 1984).

Numerous medical complications can occur after lengthy periods of binging and purging. For example, bulimics frequently suffer from sore throats, dental caries, stomach problems, dizziness, and low blood pressure. Frequent purging also may result in electrolyte imbalances (Mitchell, Pyle, Eckert, Hatsukami, & Lentz, 1983) and death due to hypokalemia (Andersen, 1983).

### *Assessment for Differential Diagnosis*

Although some of the symptoms of anorexia and bulimia may be due to endocrine and hormonal problems, there has been a trend away from diagnosis

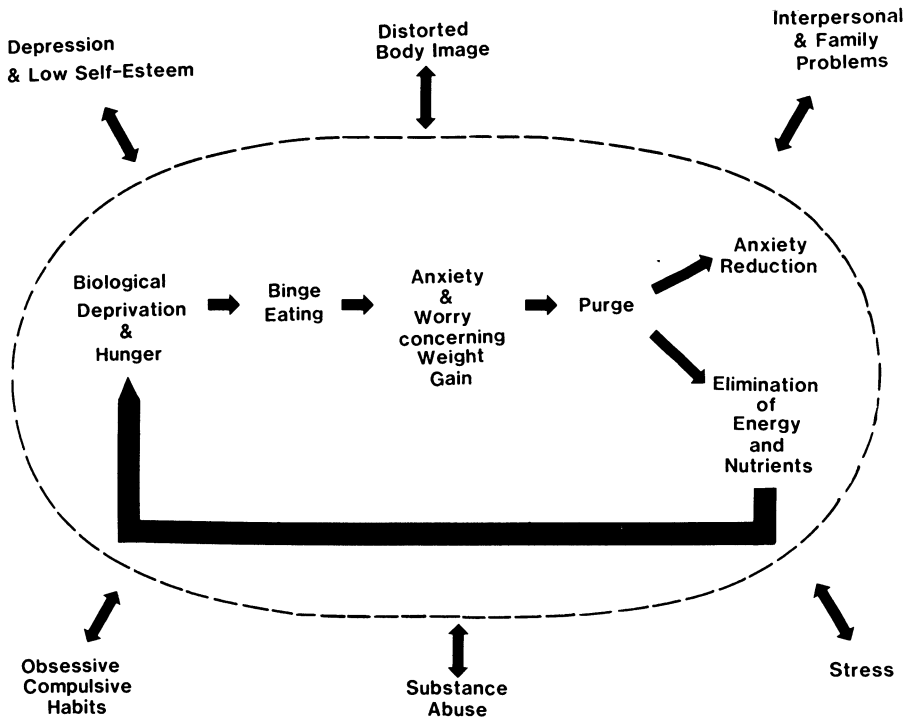


FIGURE 1. Anxiety model of bulimia.

by eliminating medical causes as they have been found to be rare (Andersen, 1983; Beumont & Abraham, 1981; Vigersky, Loviaux, Andersen, & Lipsett, 1976). Table 2 summarizes the similarities and differences among anorexics, bulimics, and obese adolescents that should be addressed when making a differential diagnosis. As shown in Table 2, bulimics are separated into two subgroups, those who purge and those who do not. This division is based on our recent research, which has shown that there are significant differences between these two subgroups. A variety of assessment procedures must be used to differentially diagnose the eating disorders. They should include interviews with the adolescent and significant others as well as psychological testing.

Anorexics and bulimics who purge share such symptoms as secretiveness, preoccupation with food, body image disturbance, fear of being obese, avoidance of forbidden foods, anxiety about eating, mood disturbances, and the overuse of weight control techniques (i.e., anorexics restrain food intake, whereas bulimics engage in cycles of bingeing followed by fasting and/or purging). In contrast, bulimics who binge-eat only do not evidence most of these symptoms. They do not appear to have a disturbed body image, nor do they experience anxiety after eating.

Until recently, body-image-perception assessment required the use of fairly complex equipment, such as the adjustable body-distorting television monitor (Allebeck, Hallberg, & Espmark, 1976) and movable calipers (Slade & Russell,

TABLE 2. Similarities and Differences Among Anorexic, Bulimic, and Obese Populations

Type	Typical weight level	Binge eating	Weight control method	Body image distortion	Concern about forbidden foods	Anxiety after eating	Mood influences on binges	Additional psychopathology
Anorexia nervosa	15-20% below normal weight	Episodic	Severe fasting	Yes	Severe	Yes	Yes	Severe
Bulimia—purgers	5% below normal weight	Frequent, with no sense of control	Purging	Yes	Severe	Yes	Yes	Moderate to severe
Bulimia—binge eaters	10% or more above normal weight	Frequent with no sense of control	Frequent restrictive diets	No	Modest	No	Yes	Normal to moderate
Nonbulimic obese	20% or more above normal weight	Occasional	Frequent restrictive diets	No	Modest	No	Yes	Normal to moderate

1973). Because of the complexity of these procedures, a simple, portable procedure called the Body Image Assessment was developed (Williamson, Kelley, Davis, Ruggiero & Blouin, 1985). The Williamson *et al.* procedure has been found to be a reliable and valid measure of body image perception (Davis, Williamson, & Ruggiero, 1984). The instrument consists of nine cards of female silhouettes that are of graduated sizes. The cards are illustrated in Figure 2. The cards are presented in random order, and the client is asked to choose the silhouette that most closely represents her *current* body size. The cards are then reshuffled, and the client is asked to choose the silhouette that most closely represents her *ideal* size. The Body Image Assessment procedure has been found to differentiate bulimics who purge from those who do not purge (Davis *et al.*, 1984). It has also been found to differentiate bulimics who purge from normals and obese patients (Williamson, Kelley, Davis, Ruggiero, & Blouin, 1985). Furthermore, the procedure is advantageous in that it is portable and can be administered quickly and easily.

Several self-report instruments are available to identify abnormal eating attitudes, methods of weight control, bingeing frequency, purging frequency, and reactions to eating certain food types. The Eating Attitudes Test (EAT) was developed by Garner and Garfinkel (1979) to identify abnormal attitudes toward eating. The instrument has been shown to discriminate anorexics from normal subjects (Mann, Wakeling, Wood, Monck, Dobbs, & Szmukler, 1983). The Binge Scale includes questions about fasting, bingeing, purging, and emotional reactions to bingeing (Hawkins & Clement, 1980). The Bulimia Test (BULIT) is a 32-item questionnaire for use in diagnosing bulimia. The instrument has been shown to correlate well with the Binge Scale (Smith & Thelen, 1984). BULIT identifies eating and purging behaviors, and a score greater than 102 is reported to be necessary for a diagnosis. Unfortunately, none of these questionnaires directly follow the DSM-III diagnostic criteria for bulimia. With this deficiency in mind, we developed the Eating Questionnaire presented in Table 3. As shown, the measure follows DSM-III criteria very closely. Furthermore, preliminary studies have supported the reliability and validity of the instrument (Davis, 1984; Ruggiero, 1984).

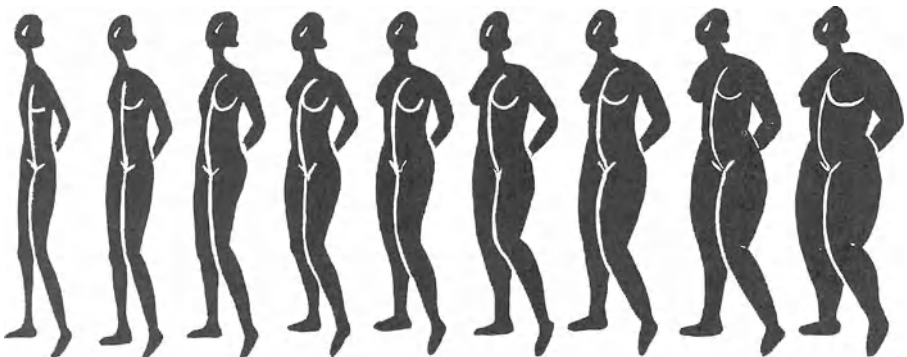


FIGURE 2. Body image assessment silhouettes.

TABLE 3. Eating Questionnaire

Directions: In the space provided, indicate the letter of the answer that best describes your eating behavior.

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- \_\_\_\_\_ 1. How often do you binge-eat? (a) seldom; (b) once or twice a month; (c) once a week; (d) almost every day; (e) every day.
- \_\_\_\_\_ 2. What is the average length of a bingeing episode? (a) less than 15 minutes; (b) 15–30 minutes; (c) 30 minutes to one hour; (d) one hour to two hours; (e) more than two hours. Please indicate length of episode \_\_\_\_\_.
- \_\_\_\_\_ 3. Which of the following statements best applies to your binge eating? (a) I don't eat enough to satisfy me; (b) I eat until I've had enough; (c) I eat until my stomach feels full; (d) I eat until my stomach is painfully full; (e) I eat until I can't eat anymore.
- \_\_\_\_\_ 4. Do you ever vomit after a binge? (a) never; (b) about 25% of the time; (c) about 50% of the time; (d) about 75% of the time; (e) about 100% of the time.
- \_\_\_\_\_ 5. Which of the following best applies to your eating behavior when binge eating? (a) I eat much more slowly than usual; (b) I eat somewhat more slowly than usual; (c) I eat at about the same speed as I usually do; (d) I eat somewhat faster than usual; (e) I eat very rapidly.
- \_\_\_\_\_ 6. How much are you concerned about your binge eating? (a) not bothered at all; (b) bothers me a little; (c) moderately concerned; (d) a major concern; (e) the most important concern in my life.
- \_\_\_\_\_ 7. Which best describes the control you feel over your eating during a binge? (a) never in control; (b) in control about 25% of the time; (c) in control about 50% of the time; (d) in control 75% of the time; (e) always in control.
- \_\_\_\_\_ 8. Which of the following describes your feelings immediately after a binge? (a) I feel very good; (b) I feel good; (c) I feel fairly neutral, not too nervous or uncomfortable; (d) I am moderately nervous and/or uncomfortable; (e) I am very nervous and/or uncomfortable.
- \_\_\_\_\_ 9. Which most accurately describes your mood immediately after a binge? (a) very happy; (b) moderately happy; (c) neutral; (d) moderately depressed; (e) very depressed.
- \_\_\_\_\_ 10. Which best describes the type of food you eat during a binge? (a) high-calorie junk food (e.g., ice cream); (b) high-calorie meals (e.g., lasagna); (c) a mixture of high- and low-calorie foods; (d) low-calorie meals (e.g., salads); (e) low-calorie snack food (e.g., fruit).
- \_\_\_\_\_ 11. Which of the following best describes the situation in which you typically binge? (a) always completely alone; (b) alone but around unknown others (e.g., restaurant); (c) only around others who know about my bingeing; (d) only around friends and family; (e) in any situation.
- \_\_\_\_\_ 12. Which of the following best describes any weight changes you have experienced in the last year? (a) 0–5 lb.; (b) 5–10 lb.; (c) 10–20 lb.; (d) 20–30 lb.; (e) more than 30 lb.
- \_\_\_\_\_ 13. On a day that you binge, how many binge episodes typically occur during that day? (a) 0; (b) 1; (c) 2; (d) 3; (e) 4 or more. Please indicate frequency \_\_\_\_\_.
- \_\_\_\_\_ 14. How often do you use restrictive diets/fasts? (a) never; (b) 1 time per month; (c) 2 times per month; (d) 1 time per week; (e) almost always.
- \_\_\_\_\_ 15. How often do you use laxatives to lose weight? (a) never; (b) 1–3 times per month; (c) 1 time per week; (d) 1 time per day; (e) more than 1 time per day. Please indicate frequency \_\_\_\_\_.
- \_\_\_\_\_ 16. How often do you use diuretics to lose weight? (a) never; (b) 1–3 times per month; (c) 1 time per week; (d) 1 time per day; (e) more than 1 time per day. Please indicate frequency \_\_\_\_\_.
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Szmukler (1983) discussed the concept of forbidden foods in relation to eating disorders. These foods are highly preferred, although they tend to be avoided. The Food Survey (Ruggiero, Williamson, Jones, & Davis, 1984) was developed to help identify food types that anorexics or bulimics either avoid or that may cause anxiety and guilt following their consumption. Very common forbidden foods are those high in carbohydrates, such as doughnuts and ice cream. Teaching the patient how to control eating and the related anxiety rather than avoiding these foods is an important part of treatment. The Food Survey has been found to be reliable and useful in differentiating bulimics who purge from obese subjects and bulimics who do not purge (Ruggiero *et al.*, 1984).

Anxiety following eating may be evaluated by means of psychophysiological assessment procedures, during which the client's heart rate, skin temperature, forearm EMG, and peripheral vasomotor responses are monitored (Williamson, Kelley, Davis, Ruggiero, & Veitia, 1985). The procedure used in our research requires the client to participate in a 10-minute adaptation followed by a 5-minute baseline period. Next, the client is required to eat a meal comprised of preselected forbidden foods. The individual is given 15 minutes to finish the meal, and psychophysiological recording continues for another 30–60 minutes. This procedure has been found to be useful for objectively assessing anxiety following eating (Williamson, Kelley, Davis, Ruggiero, & Veitia, 1985).

Self-monitoring of food intake and related factors yields very useful information regarding the patient's eating behavior. (Schlundt, Johnson, & Jarrell, 1985). Schlundt *et al.* developed a very straightforward and convenient self-monitoring procedure for eating-disordered patients. The procedure provides the therapist with data on the frequency of eating, bingeing, fasting, and purging, as well as with information on the type and amount of food eaten. Variables such as mood and activities engaged in before eating and secretiveness of the eating behavior can also be identified with this procedure.

### *Assessment of Treatment Outcome*

Successful treatment outcome for both anorexics and bulimics should reflect improvement on a variety of measures. The assessment methods used for diagnosis can also be used for evaluating treatment outcome. For example, re-administration of the Body Image Assessment, the Eating Questionnaire, BULIT, EAT, and the Food Survey during and following treatment, as well as collecting self-monitoring data on a weekly basis, can provide the therapist with feedback about changes in key variables and treatment effectiveness. In addition, monitoring the patient's weight throughout treatment is important, as initial treatment efforts focus on increasing the anorexic's weight to a noncritical level or stabilizing the bulimic's weight fluctuations.

Successful treatment may result in smaller discrepancies between the patient's perceived current and ideal body image. Measures of eating and purging should show self-reported reductions in the frequency of bingeing, fasting, and purging, as well as indications of increased control over bingeing. The EAT and

the Food Survey should reflect changes in attitudes toward eating and increased tolerance of forbidden foods. Self-monitoring information provides assessment of ongoing changes in fasting, bingeing, purging, and mood relative to these behaviors. By carefully monitoring changes in eating behavior, weight, and associated problems, the therapist can evaluate treatment across a number of dimensions.

### *Assessment of Related Problems*

Both anorexics and bulimics often display symptoms indicative of depression and anxiety, although they are frequently unable to accurately identify these mood states (Andersen, 1983). During stressful situations, bulimics tend to experience high levels of arousal and to binge more frequently than usual (Calloway, Fonagy, & Wakeling, 1983). Anorexics generally are more perfectionistic, displaying obsessive-compulsive or ritualistic behavior during periods of stress (Andersen, 1983).

Inventories such as the Minnesota Multiphasic Personality Inventory (MMPI) or the Symptom Checklist (SCL-90) help confirm suspicions of associated symptoms uncovered in the interview process. Our research (Williamson, Kelley, Davis, Ruggiero, & Blouin, 1985) has shown that a typical bulimic profile on the MMPI consists of modest elevations (between 60 and 70 *T* scores) on MMPI Scales 1, 2, 3, 4, 7, and 8. These elevations suggest undue health concerns; depression; use of conversion symptomatology to solve conflicts, particularly when under stress; poor impulse control; anxiousness; negative self-evaluation; and poor self-esteem (Lachar, 1974).

The Beck Depression Inventory (BDI) is a quick, easy method for evaluating depression. We found a mean BDI score for bulimics of 15.4 (Williamson, Kelley, Davis, Ruggiero, & Blouin, 1985), and anorexics were found by Garfinkel, Garner, Rose, Darby, Brandes, O'Hanlon, and Walsh (1983) to average 28.6. These figures suggest that both anorexics and bulimics score higher than average on the BDI, although depression is more severe among anorexics. Family and social stress appear to interact with and to exacerbate anorexia and bulimia. Therefore, it is essential to assess and treat these associated problems as well as the specific behaviors associated with the eating disorders.

## *Obesity*

### *Clinical Description*

Obesity in childhood and adolescence can be generally defined as weighing significantly more than is expected for the child's height, age, and sex. The most common definition of obesity is a weight level greater than 20% of the normal or expected weight level. However, researchers have used weight criteria as low as 10% overweight to define childhood obesity (e.g., Coates, Jeffery, Slinkard, Killen, & Danaher, 1982).

### *Course of the Disorder*

The prevalence of obesity generally increases with age and is slightly more common among girls (Brownell & Stunkard, 1980). However, obesity is a problem for some proportion of youngsters regardless of age, sex, race, or socioeconomic status. Evidence of genetic contributions to childhood and adolescent obesity is strong. Estimates of the heritability of obesity are generally around .60, which is quite high (Foch & McClearn, 1980). Most geneticists believe that obesity is best understood as an interaction between environment and heredity. Studies of the relative contributions of diet, eating habits, and exercise to the development of obesity have produced conflicting results. There is evidence that obese children eat more and are less active than normal children (Brownell & Stunkard, 1980; Johnson, Burke, & Mayer, 1956). However, other studies have failed to replicate these findings. Research concerning the eating habits of obese children has consistently shown that they eat faster and chew less thoroughly than nonobese children (Israel & Stolmaker, 1980; Keane, Geller & Scheirer, 1981; Marston, London, & Cooper, 1976). Thus, the etiology of obesity in childhood is not entirely clear. It appears likely that a genetic predisposition in combination with dietary and behavioral factors (i.e., eating habits and exercise or activity) places a child at risk for developing obesity during childhood or adolescence.

Once obesity is manifested, it is clear that the child is at a greater risk for remaining obese for life. The relationship between childhood obesity and obesity in adulthood begins at birth and becomes increasingly stronger as the child ages (Israel & Stolmaker, 1980). Generally, once a child becomes overweight, it is very likely that the weight problem will get progressively worse, unless treated. Thus, effective treatment of obesity during childhood may be the best method for preventing lifelong obesity.

Treatment of childhood obesity is important for other reasons. A number of psychological and health problems are associated with obesity during childhood and adolescence. Health problems include depressed growth hormone release, hyperinsulemia, elevated blood pressure, and increased plasma lipids (Coates & Thoresen, 1978). Common psychological and social problems include stigmatization by others and low self-esteem (Israel & Stolmaker, 1980). Furthermore, as indicated earlier, obesity is a commonly seen precursor in the development of anorexia nervosa and bulimia. Therefore, careful assessment and effective treatment of this disorder is of great significance from a variety of perspectives.

### *Assessment for Differential Diagnosis*

The most important disorder to be differentiated from adolescent obesity is bulimia. As bulimia is seldom observed before adolescence, this differential diagnosis is usually not applicable to cases of childhood obesity. As shown in Table 2, bulimics who purge are generally near their normal weight level. However, bulimics who binge-eat but do not purge, are often significantly over-

weight and therefore may appear to be traditional cases of obesity. Examination of Table 2 indicates that the primary symptoms for differentiating the two disorders are the frequency of binge eating and the feeling that eating cannot be controlled. The most useful assessment techniques for establishing the presence or absence of these symptoms are interviews with the child and the parent, self-report instruments for assessing binge eating, and self-monitoring of eating.

Interviews with parents should attempt to identify the frequency of binge eating and should investigate evidence related to secretive eating (e.g., hidden food and attempts to destroy evidence of secretive eating). Interviews with the child should attempt to establish the environmental and emotional antecedents of binge eating. One should also assess the degree of control that the adolescent has over eating between meals. If the interview data suggest frequent uncontrollable eating, a diagnosis of bulimia should be entertained.

Self-report instruments related to bulimia were discussed earlier. If scores on these instruments suggest problem binge eating, a diagnosis of bulimia should be investigated further.

Self-monitoring of eating can be very useful for establishing a diagnosis of obesity versus bulimia. Procedures such as those developed by Schlundt *et al.* (1985) are especially useful for this purpose, as they are designed to establish the antecedents and consequences of eating as well as to evaluate the type and amount of food consumed.

#### *Assessment of Treatment Outcome*

For cases of obesity, the most important measure of treatment outcome is, of course, weight change. However, additional measures are often included in order to assess adherence to treatment procedures, changes in fitness, and modification of nutrition.

Weight measures are usually obtained at least once a week in the clinic and daily at home. Follow-up measures should be obtained less frequently over the course of a year.

Measures of adherence to the treatment program generally use self-report questionnaires completed by children or questionnaires completed by parents. Data derived for self-monitoring records are also commonly used to evaluate adherence to treatment.

Programs that include exercise as a part of treatment frequently use fitness measures for evaluating this treatment component. A good example of this type of assessment has been provided by Epstein, Wing, Koeske, Ossip, and Beck (1982). These authors used the step test (Montoye, 1975) to evaluate fitness changes produced by two different exercise programs, programmed aerobics, and lifestyle change. The step test requires the subject to step up and down using an 8-inch bench at a rate of 24 steps per minute for 3 minutes. Heart rate is recorded before, during, and after the test. This procedure established that fitness was improved after treatment for both exercise programs and that the lifestyle change program was significantly more effective than programmed aerobics.

Assessment of nutrition is very difficult. Nutritionists have wrestled with this problem for years. They have developed a variety of standardized procedures and computer programs for precise measurement of nutrition. However, these procedures are very complicated, costly, and time-consuming. Epstein and his colleagues (Epstein, Masek, & Marshall, 1978; Epstein *et al.*, 1982; Epstein, Wing, Koeske, & Valoski, 1984) have established a less precise, though much simpler, method of assessment that accompanies their "traffic light diet." This procedure involves simply counting the servings of foods eaten in three major food groups. This procedure has been documented to be sensitive to change in nutrition and has been successfully used with children in a series of studies.

### *Assessment of Related Problems*

Family variables have emerged as important to the treatment of childhood obesity. These variables include the parents' weight status (Epstein *et al.*, 1984) and the parents' willingness and ability to participate in a treatment program for the child (Brownell & Stunkard, 1980). These studies have found that incorporating the parents into the child's treatment program enhances the probability of obtaining clinically significant weight loss in the child. The data suggest that parents should be knowledgeable about the program and should support the child's efforts to lose weight. However, for maintenance of weight loss, it is imperative that the child be made responsible for the behavior change and that excessive reliance on the parents for the monitoring of food intake and the management of weight be avoided (Cohen, Gelfand, Dodd, Jensen, & Turner, 1980). Therefore, use of the suggestions provided in other sections of this handbook for evaluating family dysfunction are very important in the assessment and treatment of childhood obesity. Similarly, assessment of other problems (e.g., depression) are likely to be important in properly treating obesity in childhood and adolescence, given the general findings of low self-esteem among this population (Israel & Stolmaker, 1980). However, very little research is currently available to provide empirical support for the negative impact that such problems may have on treatment.

## *Failure to Thrive*

### *Clinical Description*

Failure to thrive (FTT) is a descriptive term generally applied to infants experiencing persistent growth retardation. Because of a lack of consensus regarding the associated features, the etiology, and the treatment of FTT infants, the term itself has little diagnostic value (Stickler, 1984). The criteria commonly used to classify infants as FTT include weight that is persistently below the third percentile for age on standardized growth charts or a loss of weight or a failure to gain weight that is represented by a fall of two or more major percentiles (i.e.,

two or more standard deviations) on the growth curve (Bithoney & Rathbun, 1983).

Depending on the definition of FTT that one adopts, the clinical picture of this disorder may also include developmental delay, maternal deprivation, socially withdrawn and passive infant behavior, hyperactive and irritable infant behavior, lack of appetite, hyperphagia, feeding problems, lack of an organic etiology, or lack of any obvious cause (Accardo, 1982; Bithoney & Rathbun, 1983; Krieger, 1982).

Failure to thrive is a common pediatric disorder. Prevalence rates have been estimated to be as high as 10% in some rural outpatient areas, and hospitalization rates for FTT range from 3% to 5% of all infant admissions and 1% of all pediatric admissions (Bithoney & Rathbun, 1983). Furthermore, recent data suggest that, in a majority of FTT cases, no identifiable organic cause can be found (Homer & Ludwig, 1981; Sills, 1978).

#### *Course of the Disorder*

Failure to thrive typically appears rather early in infancy, although actual incidence data by age are sparse. No single course of FTT can be delineated; rather, the ultimate impact of FTT is a function of the type, severity, and duration of associated features. Well-controlled prospective studies of FTT are rare. The limited evidence that does exist suggests that inadequate growth in FTT continues to be a problem in at least one quarter of all cases, and cognitive and behavioral deficits have been estimated to occur in over half the children who were followed (Bithoney & Rathbun, 1983). One study that compared the developmental outcomes of organic, nonorganic, and normal control infants reported significant differences between both FTT groups and normals in sensorimotor skills at 8 and 20 months, and in IQ at 3 years of age (Singer & Fagan, 1984).

#### *Assessment for Differential Diagnosis*

An obvious differential diagnosis to be considered in the assessment of FTT is whether organic or nonorganic factors are responsible for growth failure. Until recently, the diagnosis of nonorganic FTT required the prior exclusion of all organic variables and a therapeutic hospital trial in which dietary intake could be closely monitored. Recently, objections have been raised against each of these procedures. For example, given the finding of a rather low rate of cases in which organic factors alone are implicated, withholding the assessment of environmental or psychosocial factors until organic causes have been ruled out is viewed as a considerable waste of time and resources (Homer & Ludwig, 1981; Sills, 1978). In fact, two separate studies have found that less than 2% of laboratory tests ordered during assessment produced positive diagnostic data. Moreover, when positive laboratory results and organic causes were found, they had usually been indicated by previously obtained history and physical examination (Berwick, Levy, & Kleinerman, 1982; Sills, 1978). The overemphasis on a diag-

nostic therapeutic trial in the hospital has also been questioned because of the heterogeneity with which nonorganic FTT infants respond to such trials (Casey, Bradley, Wortham, 1984; Rosenn, Loeb, & Jura, 1980). Current trends in FTT assessment deemphasize the organic-nonorganic dichotomy and, instead, recognize that a combination of organic and nonorganic factors can and often do interact to produce the problems associated with a given FTT case. Therefore, most authorities now recommend that the assessment of nonorganic FTT variables proceed concurrently with the assessment of organic factors (Bithoney & Rathbun, 1983).

Recent emphasis on the role of environmental and behavioral variables in FTT has prompted the use of a variety of assessment instruments. Psychologists must be careful, however, not to repeat the errors made by physicians ordering a "cascade of esoteric diagnostic procedures" (Rosenn *et al.*, 1980, p. 704) in their FTT assessments. The instruments and techniques used should inevitably lead to a clearer formulation of the functional role that psychological variables play in maintaining the problems associated with FTT. Two areas in which a thorough assessment may reveal important functional relationships are infant feeding behavior and mother-infant interaction patterns.

An evaluation of the parameters associated with the dietary behavior of FTT infants is a critical, yet often overlooked, area of assessment. Overemphasis on other, more distal variables (e.g., the degree of attachment) can often preclude an adequate investigation of simply how much, how often, and in what manner food is ingested by the infant. Such oversights may also follow a dietary history from the mother that is erroneously assumed to be a valid indication of a satisfactory nutritional history. That undernutrition is an important contributor to FTT is evidenced by one study in which over half the mothers of FTT infants reported such problems as feeding difficulty with the FTT child, skimpier and less regular meals, and a lower daily caloric intake (Kotelchuck & Newberger, 1983). In addition, two studies have been conducted in which the only intervention provided was the delivery of meals of adequate caloric value to the homes and passive observation as the mother fed the infant. Substantial gains in weight were found in one study (Whitten, Pettit, & Fischkoff, 1969), and impressive gains in weight, height, and developmental scale scores were found in another (Ramey, Starr, Pallas, Whitten, & Reed, 1975).

Whereas clinical interviews and nutrition checklists (e.g., Krieger, 1982) may provide some clues regarding feeding habits and problems, actual observation of mealtime behavior in the hospital or the home may be the only means by which one can be assured that undernutrition has been assessed adequately. Although not essential for identifying specific feeding problems, elaborate behavioral codes have been developed with which one can score videotaped feeding interactions (Klesges, *et al.*, 1983; Pollitt & Wirtz, 1981). Also available is a simple system developed to assess both the caloric and the nutrient value of the food consumed in a hospital setting (Traughber, Erwin, Risley, & Schnelle, 1983). This system has been shown to consistently correspond to more time-consuming nutritional assays.

Although the mechanisms by which aberrant mother-infant interaction re-

tards growth despite adequate caloric intake have not been discerned (Krieger, 1982), evidence does exist of a possible functional relationship between these variables (e.g., Brazelton, 1981; Green, Campbell, & David, 1984; Rosenn *et al.*, 1980). For example, Rosenn *et al.* (1980) developed a diagnostic method that, although not designed to directly assess mother–infant interaction, does assess the degree of approach and withdrawal behavior exhibited by infants when interacting with an examiner. This very simple, easily conducted assessment procedure not only differentiated between nonorganic and organic FTT infants but also reflected changes that coincided with significant weight gain. Of course, a potential problem with the use of assessment techniques that focus on infant social behavior is the overreliance during treatment on variables that may be affected by changes in weight but whose manipulation may not influence important physical and developmental indices (Ramey *et al.*, 1975; Rosenn *et al.*, 1980).

#### *Assessment for Treatment Outcome*

The assessment techniques used to identify those problem areas that maintain delayed growth and development can also be used to assess treatment outcome. Thus, if a videotaped assessment of parent–infant feeding reveals possible deficits that are then targeted for remediation, repeated assessments can aid in the evaluation of the efficacy of that remediation.

Additional assessment procedures that are relevant to treatment outcome include caloric intake, measures of physical growth, and evaluation of cognitive and behavioral functioning (e.g., IQ tests and developmental scales).

#### *Assessment of Related Issues*

The assessment and treatment of FTT cases can be quite difficult and are probably best conducted as part of a multidisciplinary team approach. Often, gains are short-lived, and extensive follow-up assessments are needed. In addition, other important variables not mentioned above may be present and may affect treatment efforts. Such variables include maternal isolation, depression, or anxiety; differences between parents in expectations and management of the child; financial deprivation; and parental neglect (Bithoney & Rathbun, 1983). The reader should consult other chapters of this text for the details of assessing these problems.

### *Food Refusal*

#### *Clinical Description*

Food refusal can present as a reluctance to eat any foods outside a select group of preferred foods or food textures (e.g., liquid formula or pureed foods), or as a persistent refusal to eat foods in amounts sufficient to produce appropriate weight gain (Krieger, 1982; Linscheid, Oliver, Blyler, & Palmer, 1978; Palmer, Thompson, & Linscheid, 1975). Other feeding problems that may be associated



with food refusal include mealtime tantrums or playing with food; gagging, choking, or vomiting of certain foods; and difficulty in swallowing or chewing.

### *Course of the Disorder*

The course of food refusal differs among those populations that experience this problem. Many normal preschoolers become very picky eaters but eventually outgrow their stubbornness with time and appropriate parental management (Christophersen & Hall, 1978; Siegel, 1982). Developmentally delayed or handicapped children may develop eating problems when switched to more solid foods or when given more responsibility for self-feeding (Iwata, Riordan, Wohl, & Finney, 1982). Children who have been taken off solid foods temporarily because of certain illnesses or surgery may refuse these foods when reintroduced, especially if prior eating had been associated with painful swallowing or vomiting (Siegel, 1982). Finally, Krieger (1982) has noted that many children who were small for gestational age (SGA) "tend to be picky eaters with capricious appetites," who eat only enough to maintain their small size (p. 147). Therefore, depending on the particular case, the impact of food refusal problems varies considerably. The problem may quickly dissipate or may cause significant family disruption, produce malnourishment and retarded growth, or even threaten a child's life.

### *Assessment for Differential Diagnosis*

Parental interviews and a review of past medical and developmental events can provide much useful information regarding the history of the problem behavior and its current topography. In general, children in food refusal cases are older than FTT infants and show less severe weight and eating problems. Children with problems of food refusal frequently have changed their eating habits, whereas FTT infants have never developed appropriate eating habits. A 24-hour dietary recall and completion of measures such as the Food Frequency Listing (Murray & Glassman, 1982) can help specify food flavor and texture preferences. In addition to gaining information on the frequency, severity, and duration of food refusal, the interview can be used to generate hypotheses regarding relevant antecedents and consequences that maintain the eating problem (Iwata *et al.*, 1982). In sum, information gained from the interview can help to differentiate among the variety of forms and etiologies of food refusal and can help in differentiating food refusal from FTT.

Actual observation of mealtime behavior is needed, however, to confirm hypotheses about maintaining variables that may be targeted for treatment. Videotape recording of meals can allow for less obtrusive observation and can minimize the reactivity of parent and child behaviors. Unobtrusive observation may be especially relevant in food refusal cases maintained by others' attention to the child's eating behavior.

Valuable information may also be obtained from videotaped meals in which parents are given instructions to alter typical mealtime behavior along a given

dimension. Such diagnostic trials may assist in distinguishing among food refusal problems maintained primarily by insufficient parental reinforcement for appropriate eating, excessive attention given to food refusal, or both. Also, the capabilities of the parents in altering their mealtime behavior and in following through with treatment recommendations can be assessed with this assessment procedure.

#### *Assessment for Treatment Outcome*

Feedback on treatment efficacy can be obtained most profitably from repeated behavioral observations of mealtime behavior and the quantification of the amounts and variety of foods eaten (Palmer *et al.*, 1975; Siegel, 1982; Traughber *et al.*, 1983). Equally important is the quantification of relevant parent behaviors (e.g., prompts, praise, and ignoring) and child behaviors (e.g., bites and noneating behavior) (see, e.g., Klesges *et al.*, 1983). A neglected aspect of the treatment of food refusal has been the assessment of the differential effectiveness and acceptability of treatments that are based on strict consequences (e.g., praise or ignoring) for appropriate eating and the acceptance of prompts for eating (e.g., Palmer *et al.*, 1975) versus treatments that attempt to minimize parental consequences and expressed concern over food refusal (e.g., Christophersen & Hall, 1978).

#### *Assessment of Related Issues*

Food refusal problems may be just one manifestation of a more pervasive parenting skills deficit requiring evaluation and treatment. Also, successful implementation of treatments in the home may require an evaluation of other household members' adherence to treatment recommendations. Finally, the assessment of food refusal behavior in SGA children should include an appraisal of the extent to which parents' expectations for increased appetite and growth are congruent with realistic medical estimates. The exertion of undue pressure by parents may actually exacerbate these children's problem (Krieger, 1982).

## ELIMINATING DISORDERS

### *Enuresis*

#### *Clinical Description*

Functional enuresis has been defined as the persistent occurrence of wetting in the absence of urological or neurological pathology (Doleys, 1977, 1983). To be classified as enuretic, the individual must be beyond the age at which normal bladder control is typically obtained. Estimates of the age at which a child may be considered enuretic have varied considerably and have ranged from 3 to 5 years old. The DSM-III diagnostic criteria for functional enuresis are presented in Table 4. The DSM-III criteria define the disorder as "involuntary" voiding.

TABLE 4. DSM-III Diagnostic Criteria for Functional Enuresis and Encopresis

## Functional enuresis

- A. Repeated involuntary voiding of urine during the day or night.
- B. Minimal frequency of involuntary voiding of twice per month for children of the ages of 5 and 6, and at least one per month for older children.
- C. Not due to a physical disorder, such as diabetes or a seizure disorder.

## Functional encopresis

- A. Recurrent episodes of voluntary or involuntary defecation of normal consistency into places not appropriate for that purpose in the individual's own sociocultural setting.
- B. A minimum frequency of one such event a month after the age of 4.
- C. Not due to a physical disorder, such as aganglionic megacolon.

*Note.* Adapted from *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.) (pp. 80, 82) by American Psychiatric Association, 1980, Washington, D.C.

Doleys's definition (1977) seems preferable, as the issue of involuntary versus voluntary voiding can often be determined only subjectively (Doleys, 1983).

Several types of functional enuresis have been delineated. *Nocturnal enuresis* refers to bed-wetting, and *diurnal enuresis* refers to daytime wetting. Given the enuretic history, the child can be further classified as exhibiting primary or secondary enuresis. The primary enuretic has never achieved a period of continence; the secondary enuretic has achieved a period of continence for at least 6 months before the onset of regular wetting (Doleys, 1983). A further distinction is sometimes made between regular and irregular enuresis (Barmann, Katz, O'Brien, & Beauchamp, 1981). *Regular enuresis* refers to daily wetting; *irregular enuresis* refers to sporadic wetting interspersed with appropriate voiding.

While there are numerous types of urinary incontinence, nearly 90% of all enuretics are functional, and approximately 80% of these are primary (Doleys, 1983; Wells & Forehand, 1981). Nocturnal enuresis is more common than diurnal, although 30% of all nocturnal enuretics also wet during the day (Lovibond & Coote, 1970). Enuresis is twice as common in boys as in girls and appears to be more common in children from impoverished families (Williams, Foreyt, & Goodrick, 1981).

### *Course of the Disorder*

Enuresis is a childhood problem that diminishes in frequency with age (Cohen, 1975; Doleys, 1983). Approximately 20% of all 5-year-olds exhibit some form of enuresis. The percentage decreases to about 5% by age 10 and to less than 2% by age 14 (Doleys, 1983; Walker, 1978). In spite of the relatively high rate of spontaneous remission, several reasons have been offered for the importance of treating enuretics (Doleys, 1983). First, as Doleys (1983) suggested, there are no criteria for determining who will and who will not remit with time and maturation. Second, it may be that enuretic children do not just spontaneously recover but are exposed to contingencies that increase appropriate voiding. In such cases, the contingencies are likely to involve the use of aversive consequences. Finally, young enuretics are treated more easily than older chil-

dren. In addition, other physical and social factors warrant the early treatment of enuresis. Untreated enuresis can result in skin irritations and urinary tract infections and possibly in decreased bladder functioning (Barmann *et al.*, 1981).

Numerous etiological factors associated with enuresis have been implicated. Some theorists have suggested that enuresis is a symptom of other emotional problems and that treatment of enuresis alone will result in symptom substitution (cf. Feldman, 1983). Although enuretics may be somewhat more likely to exhibit other behavior problems, causal relationships have not been identified, nor has focused treatment of enuresis been found to result in symptom substitution (Feldman, 1983). Lack of arousal during sleep has also been suggested as a potential factor in nocturnal enuresis, although data supporting this view are equivocal (Siegel, 1983). Another perspective hypothesizes that enuretic children have smaller than normal bladder capacities and consequently void more frequently than normal children and are unable to inhibit nighttime wetting. Data in support of this perspective are inconclusive (Doleys, 1983). The most accepted theoretical position on the etiology of enuresis is that the disorder results from an inadequate learning history and lack of effective contingencies (Doleys, 1978).

### *Assessment for Differential Diagnosis*

Before psychological assessment, it is important to have the child evaluated medically. The medical evaluation typically includes a general physical exam, a urinalysis, and a urine culture for detecting infection or other pathology (Doleys, 1983).

A thorough clinical interview and a relatively lengthy baseline data collection period have been recommended repeatedly. Both sources of data should focus on obtaining a comprehensive description of the problem and aid in treatment selection (Ciminero & Doleys, 1976). The clinical interview, which is typically conducted with the parent and the child, should be used to obtain a history and a current description of the problem, data on any other child and family problems, a brief family medical history, and information on previous treatment attempts (Doleys, 1983). Historical data should be obtained on the child's toilet training, and periods of continence, and on environmental variables associated with intervals of continence and incontinence. In specifying the problem behavior, information is collected on the estimated frequency of day and nighttime wetting, on sphincter control, on environmental events associated with appropriate and inappropriate voiding, and on the child's actual toileting behavior (Ciminero & Doleys, 1976; Doleys, 1983). Frequent daytime voiding of small amounts of urine is associated with inadequate bladder capacity and could have treatment implications (Walker, 1978). Clients should also be questioned about pain during urination, daytime dribbling, urgency to urinate, retention ability, small, irregular-stream urination, and frequent urinations, as combinations of these factors are associated with medical problems (Doleys, 1978).

The presence of child, family, or marital behavior problems may impede treatment progress and thus should be evaluated (Doleys, 1978). In some in-

stances, the child may exhibit behavior problems such as noncompliance that must be treated before treatment of the enuresis (Doleys, 1978). Although enuresis is usually not associated with other problems, this association can occur and should be assessed. In cases where other problems, such as social anxiety or depression, exist, the enuretic behavior may need to be treated in a broader context. A related issue is the assessment of family resources for implementing treatment. For example, although dry-bed training may be the quickest treatment, the family may be unable or unwilling to use such a time-consuming treatment.

Obtaining a description of previous treatment attempts may influence the choice of treatment. Knowing why a previous treatment failed may also point to issues relevant to the use of any treatment. For example, did one parent sabotage the treatment by refusing to cooperate?

The purpose of baseline recording is to obtain an accurate account of the frequency of day and nighttime wetting (Doleys, 1983). As some children wet the bed multiple times during the night, the child should be checked before the parents' bedtime, once during the night, and again on waking (Wells & Forehand, 1981). Although frequency of wetting is the minimum information required, other measurements should ideally be collected and should include the size of the wet spot on the bed, the time of wetting, the antecedents to and consequences of wetting, spontaneous awakenings to void, and the frequency of voiding (Ciminero & Doleys, 1976). The parents should also record the amount voided during the day for a one-week period. This calculation can be used to determine the child's bladder capacity (Doleys, 1983).

Merely requiring the parents to record whether or not the child was dry on awakening is insufficient, as initial changes in enuretic behavior may be assessed only by the size of the wet spot or by decreases in the number of nighttime wettings (Ciminero & Doleys, 1976).

#### *Assessment of Treatment Outcome*

Treatment evaluation involves primarily a continuation of the baseline data collection procedures. Although fine-grain measures, such as the size of the wet spot and the number of spontaneous awakenings, may be the only detectable changes when treatment is instituted initially, measures other than frequency of wetting may prove less useful as the impact of treatment strengthens.

Particularly during the initial phases of treatment, it is essential to closely supervise the treatment and to ensure parental understanding of the procedure, as both factors are related to treatment success (Doleys, 1978). In addition, it is important to prepare parents for the fact that treatment effects may not occur immediately. Follow-up data should be obtained, as relapses are quite common.

#### *Assessment of Related Issues*

Perhaps the most likely problems related to enuresis are medical complications of the disorder. Enuresis can result in skin irritations, bladder infections,

and perhaps inadequate bladder capacity because of a lack of use. Other physical problems, such as neuromuscular defects, renal diseases, and dysfunctional bladder syndrome, are also associated with enuresis. However, as Doleys (1983) illustrated, it is sometimes inappropriate to assume that certain physical problems preclude the psychological treatment of urinary incontinence.

## *Encopresis*

### *Clinical Description*

Encopresis has been defined as "the passage of fecal material of any amount or consistency into the clothing or other generally unacceptable areas in the absence of any organic pathology beyond the age of 3" (Doleys, 1978, p. 102). However, definitions of encopresis have varied with regard to earliest age of onset, assumed etiology, and what constitutes soiling behavior (Fitts & Mann, 1977). For example, the DSM-III criteria for the disorder, which are presented in Table 4, specifies that the soiling must be of normal to near normal consistency.

Numerous subclasses of encopretic behavior have been delineated based on the child's psychological adjustment, toileting history, and soiling behavior. Like enuretics, encopretics can be either primary or secondary. The primary encopretic has never achieved a period of fecal continence, whereas the secondary encopretic has achieved a period of fecal continence for at least six months. Encopresis may be either retentive or nonretentive. The nonretentive encopretic is not constipated, and soiling is apparently due to inadequate toilet training or to stress (Doleys, 1978). The retentive encopretic, who is by far the more common, is constipated and refuses to use the toilet. The constipation can become chronic and can result in impaction and decreased muscle tension (Walker, 1978). With continued impaction, fluid from the intestine cannot be absorbed and thus seeps out and passes onto the clothing (Walker, 1978). The retentive encopretic may accurately deny feeling the need to defecate (Walker, 1978). Because of the seepage, retentive encopretics are sometimes treated inappropriately with constipating agents, which only exacerbates the condition (Doleys, 1983). Like enuretics, encopretic children have also been classified based on frequency of soiling, which can range from infrequent (less than weekly) to very frequent (daily) (Doleys, 1983; Doleys, Schwartz, & Ciminero, 1981).

Environmental factors associated with soiling have also been used to distinguish among encopretics. In some children, the encopretic behavior is maintained by avoidance of a feared stimulus (Siegel, 1983). Soiling can be due to avoidance of painful defecation or of the toilet. Other encopretics may engage in the behavior in an attempt to manipulate the environment. Still others soil only in certain environments, such as the school or the home (Walker, 1978).

Encopresis occurs in approximately 36% of all children (Levine, 1975). Like enuresis, encopresis decreases with age and is by far more common in males than in females (Werry, 1979). However, unlike in enuresis, almost all encopretic episodes occur during the day (Doleys, 1978; Levine, 1975). Approximately 30% of all encopretics are also enuretic (Levine, 1975).

### *Course of the Disorder*

Several theoretical explanations have been delineated for the etiology of encopresis. As with enuresis, psychodynamic theories have suggested that encopretic behavior is a symptom of other pathology. This perspective is not supported by the literature, as most encopretics and their families do not exhibit other maladaptive behavior (Walker, 1978).

The medical approach emphasizes the role of deficits in neurological and anatomical functioning as the cause of encopretic behavior. As numerous physical and dietary factors have been associated with encopresis, the role of biological factors in the development and maintenance of encopretic behavior should always be considered (Doleys, 1983; Lanyon & Goldsworthy, 1982). For example, constitutional factors and dietary habits may be relevant to the development of constipation and encopresis.

As with enuresis, the behavioral model describes encopresis as behavior resulting from an inadequate learning history and the lack of effective contingencies (Doleys, 1983). The role of reinforcement in the maintenance of encopretic behavior is fairly well documented. Further, the emphasis on skill deficits in the maintenance of encopretic behavior, particularly that of primary encopresis, has led directly to the development of effective treatments.

### *Assessment for Differential Diagnosis*

As in enuresis, the assessment of the encopretic child should include a medical evaluation, a thorough clinical interview, and baseline data collection. The medical exam often includes a general physical, a medical history, a rectal examination, and an enema (Doleys, 1978). As Doleys (1983) suggested, constipation is associated with several medical problems, including congenital hypothyroidism, rectal anomalies, and Hirschsprung disease. Other medical problems that may cause encopresis include spinal cord defects or injuries (Siegel, 1983). Furthermore, impaction can result in a variety of medical complications, including distention of the colon and dilation of the anus (Wells & Forehand, 1981). Thus, collaboration with medical personnel is essential in the assessment and treatment of encopresis (Nisley, 1976).

The clinical interview should focus on delineating what type of encopresis the child exhibits, obtaining a history of soiling and of toilet training, and determining what environmental factors are associated with the encopretic behavior (Doleys, 1983; Siegel, 1983). Further, the clinician should identify whether the child has additional behavior problems and whether marital or other family problems exist (Doleys, 1978). The presence of child and family problems do not necessarily preclude the treatment of encopresis. However, as with enuresis, it is important to determine whether treatment can be reasonably instituted with the presence of other problems.

Baseline data collection can help to determine patterns of soiling and appropriate toileting, as well as to identify contingencies maintaining the behavior. Records should be obtained on the frequency and amount of soiling and appro-

priate toileting, the consistency of the fecal matter, and the situational variables associated with soiling and appropriate toileting (Doleys, 1978). Baseline data collection should not be limited to frequency of soiling, as decreased soiling may only be a function of increased retention (Doleys, 1983).

#### *Assessment of Treatment Outcome*

In addition to the continued recording of the data collected during baseline (e.g., frequency of soiling), care should be given to evaluating the integrity with which the treatment is implemented. As laxatives and stool softeners are frequently used in treating the retentive encopretic, their use should be monitored. Very frequent supervision of the treatment is essential, and some authors have suggested almost daily telephone contact during the first few weeks of treatment (Christopherson & Berman, 1978). Treatment integrity may also be enhanced by providing the parents with written descriptions of the procedures. Particularly in the case of children who are being trained in appropriate toileting procedures, the contents and implementation of such training should be reviewed frequently.

#### *Assessment of Related Issues*

Encopresis is a condition that has been associated with other physical, intellectual, and behavior problems. Some authors have reported that encopresis may be more common in children with developmental delays or intellectual deficits. However, except in children who have not received effective toilet training, well-controlled studies have failed to establish a relationship between IQ and encopresis (Walker, 1978).

Perhaps the most frequently cited problems relevant to encopresis are physical. As mentioned earlier, certain physical factors can play a role in the development of constipation and consequent encopretic behavior. Numerous diseases and other physical conditions can produce diarrhea or constipation or can inhibit fecal continence. Thus, although soiling may occur in these instances, the child cannot be appropriately labeled encopretic. Physical complications can also result from retentive encopresis. These include colon distention, habituation to rectal sensations, impaction, and anal dilation (Doleys, 1978; Lanyon & Goldsworthy, 1982). Therefore, inclusion of medical examinations throughout treatment may be important in cases where the physical consequences of encopresis may become a problem.

## SUMMARY

Eating and eliminating disorders are common problems of childhood and adolescence. In recent years, a better understanding of the symptoms and etiology of these disorders has led to improved diagnostic practices and assessment



methods. This chapter summarized these methods and described commonly used diagnostic considerations. In general, these procedures are in the developing stages. Clearly, much work remains. However, as the knowledge base increases, assessment procedures and treatment interventions should become more established, and appropriate tests of their efficacy should be forthcoming.

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# 19 Parental Roles in Childhood Psychopathology

REX FOREHAND

The state of the American family has come under close scrutiny in recent years in the psychological literature. For example, in his presidential address to the American Psychological Association, Conger (1981) traced the changing nature and functions of the family from 1800 to the present. He noted a number of social changes in our society that had increased the stress on the family in the 1980s: the isolation of the family from other social institutions; the women's movement and women's participation in the labor force; and the preoccupation with oneself rather than with others. Furthermore, Conger pointed out that the divorce rate had continued to increase and that, as a result, many households were headed by women and were at or below the poverty level. Simultaneously, the federal government was reducing the social programs that were necessary for these struggling families. Although more recent data suggest that the divorce rate may have peaked, the number of children living in one-parent families and in stepfamilies is projected to continue to increase (Hernandez, 1985). In short, the family and the changes it is undergoing are important topics of study for psychologists interested in the welfare of children.

Concern with the family has not been limited to the professional literature. Newspapers, radio, television, and magazines are constantly portraying the pitfalls of the American family and/or reporting the demise of this institution. As an example, *Newsweek* devoted its January 10, 1983, cover story to the family in an article entitled "Divorce American Style." Legal issues involving custody of children, property settlement, and grandparents' rights were considered. The following statement appeared on the cover: "The courts are changing the rules of divorce and child custody—and often making things worse."

The laws regarding the family, and even the participants in the family, may be changing; nevertheless, the American family still does exist today and serves as the arena in which our children are reared. The concern of this chapter is how the family influences children and, more particularly, how to assess the familial dysfunctions that may exist when a child is referred for psychological treatment.

This chapter reviews four areas of family functioning and how they relate to the development of the child-parenting skills, parental personal variables, the marital relationship, and extrafamilial factors. Initially, the literature concerning how each of these relate to the child's adjustment in the family is reviewed. Subsequently, procedures for assessing these areas of family functioning are delineated.

It is important to note that the perspective taken by the author of this chapter is one that Griest and Wells (1983) labeled an "expanded behavioral family therapy model" (p. 38). That is, initially, it was assumed that difficulties of children in the family resulted from deficits in parenting skills. During the 1960s and 1970s, this model resulted in numerous studies demonstrating that parents could be taught skills with which to interact more effectively with their children. Nevertheless, neither the short- nor long-term results were as successful as had initially been assumed or hoped for (for reviews see Griest & Forehand, 1982; Griest & Wells, 1983). Thus, additional factors in the family or impinging on the family that may influence parenting skills, a child's adjustment, or parent and child responsiveness to treatment began to be considered in the late 1970s and the 1980s. This chapter examines both parenting-skill deficits and the additional family factors that may exist when a child is referred for treatment.

## OVERVIEW OF THE LITERATURE

### *Parenting-Skills Deficits*

The work that has been completed on parenting skills is almost exclusively on conduct-disordered children. As Wells and Forehand (1981, 1985) have noted, these children are the ones most commonly referred for psychological treatment. Behaviors displayed by conduct-disordered children include non-compliance, aggression, destruction, tantrums, and high-rate annoying behaviors (Wells & Forehand, 1981, 1985). The research has consistently shown that children referred to clinics for these problems demonstrate a higher rate of such behaviors than children not referred to clinics (i.e., nonclinic children) (e.g., Delfini, Bernal, & Rosen, 1976; Forehand, King, Peed, & Yoder, 1975; Green, Forehand, & McMahon, 1979; Griest, Forehand, Wells, & McMahon, 1980; Patterson, 1976).

Of primary concern to us are the parenting-skill deficits that may exist concomitantly with, and that presumably lead to, such problem behaviors. Mothers of clinic-referred children have been found to issue significantly more commands to their children than do mothers of nonclinic children (Forehand *et al.*, 1975; Green *et al.*, 1979; Lobitz & Johnson, 1975). Not only the frequency but the type of command appears to differ, as Delfini *et al.* (1976) found that mothers of clinic-referred children gave more negative commands. Mothers of clinic children have been reported to be significantly more negative in general toward their children (Lobitz & Johnson, 1975; Patterson & Cobb, 1973) and, in particular, to criticize their children more often than mothers of nonclinic children

(Forehand *et al.*, 1975). Furthermore, in reviewing data from the Oregon Research Institute, Patterson (1976) noted that parents of conduct problem boys fail to provide appropriate consequences for deviant behavior more often than parents of nonclinic children. In contrast to the above differences is the finding across studies that neither positive parent behavior in general (Forehand *et al.*, 1975; Green, Forehand, & McMahon, 1979; Griest *et al.*, 1980; Lobitz & Johnson, 1975) nor parental positive reinforcement for inappropriate child behavior (Patterson, 1982) differs significantly between parents of conduct-disordered clinic-referred children and nonclinic ("normal") children.

A special category of parenting-skill deficits involves child abuse. Wolfe (1985) reviewed the question of what kinds of excesses and/or deficits exist in the repertoires of parents who physically abuse their children. He concluded that abusive mothers demonstrate more aversive behavior (threatening, yelling, and hitting) toward their children than do nonabusive mothers.

In summary, parents of nonclinic and conduct-problem clinic-referred children differ in the number and type of commands issued and in negative behaviors emitted toward their children. When abusive families are considered, the negative behaviors of parents appear to be particularly prevalent. On the other hand, differences between parents of clinic-referred and nonclinic children have not been reported in terms of positive behaviors directed toward the children.

As noted earlier, there are differences in the behavior of clinic-referred conduct-disordered children and nonclinic children. Nevertheless, the literature suggests that there are similarities in the two groups. For example, Delfini *et al.* (1976) and Lobitz and Johnson (1975) found substantial overlap between the distributions of deviant child behavior for the two groups. That is, some non-clinic children demonstrated more deviant behaviors than the clinic-referred children. Such findings suggest that there may be factors other than the child's behavior that lead to referral to a clinic for treatment.

The research at this time suggests that parent perceptions of child behavior may be a primary factor leading to such referrals. For example, both Lobitz and Johnson (1975) and Griest *et al.* (1980) found that, from an array of measures, parent perception of the child was the best discriminator between clinic-referred and nonclinic children. The next three sections consider three areas of family functioning that have been associated with parents' perceptions of their children, child behavior problems, and/or clinic referral of children by their parents.

### *Parental Personal Maladjustment*

The primary parental characteristic that has been associated with child behavior problems or perceptions of such problems is depression. This association is not surprising, as McLean (1976) noted that having children is a primary demographic indicator for being at high risk for depression. A number of studies have appeared in the psychiatric (see Beardslee, Bemporad, Keller, & Klerman, 1983, for a review) and psychological (see Forehand, Furey, & McMahon, 1984, for a review) literature indicating that maternal depression is associated with child-rearing difficulties. This relationship exists in both nonabusing parents (e.g., Griest, Wells, & Forehand, 1979) and abusing parents (Lahey, Conger,

Atkeson, & Triber, 1984). In particular, maternal depression appears to be related to *perceptions* of child adjustment, which, as noted earlier, is the best predictor of child referral to a clinic for treatment of behavior problems. One study from the psychological literature is reviewed here as an example of the work completed and then several conclusions from the available literature are discussed.

Rickard, Forehand, Wells, Griest, and McMahan (1981) hypothesized that maternal depression, rather than child behavior, leads to the clinic referral of some children. In order to test this hypothesis, they examined differences in parent characteristics among three groups: two clinic-referred subgroups of children and a nonclinic group. Children who were assigned to the clinic-deviant group were more noncompliant and deviant than the nonclinic sample, as determined by extensive home observations. On the other hand, children who were assigned to the clinic-nondeviant group, although referred for noncompliance and other behavior problems, did not differ from the nonclinic sample on either of these behaviors. In addition to the home observations by independent observers, parent questionnaires examining parental depression and parental perceptions of child adjustment were completed. The mothers in both of the two clinic groups perceived their children as more maladjusted than did the mothers in the nonclinic group. In addition, the mothers of the children in the clinic-nondeviant group were significantly more depressed than those in the remaining two groups. As the children in the clinic-nondeviant group were not more deviant or noncompliant than the nonclinic group, it appears that the mothers' depression rather than the children's behavior was a significant factor in the mothers' perceptions of child adjustment and the referral of these children for treatment. An additional finding was that the mothers in the clinic-deviant group issued more vague, interrupted commands than did the mothers in the clinic-nondeviant group, a finding supporting the hypothesis that the deviant behavior of children in this group was associated with ineffective parenting skills.

The Rickard *et al.* study is characteristic of most of the existing literature, as it does not demonstrate a relationship between parental depression and actual child behavior. Rather, the relationship is between parent depression and parent perceptions of child behavior. However, in a later study, Forehand, Lautenschlager, Faust, and Graziano (1985) did find an indirect link between parent depression and child behavior. Using a path analysis, these investigators found that parent depression was significantly related to parent perceptions of child behavior, and also to an increase in parental commands that was related to an increase in child noncompliance. Although the link between parental depression and parental commands was weaker than that between parental depression and parental perceptions of child deviance, this study represents an important first step in linking depression to parent and child behavior.

### *Marital Dysfunction*

Behavior therapists, psychodynamic therapists, and family systems therapists generally hold that there is a relationship between marital difficulties and childhood problems (O'Leary & Emery, 1985). However, the extent of the rela-



tionship, as well as which factor may be the cause and which the effect, remains in question. Several excellent reviews (Emery, 1982; Margolin, 1981; O'Leary & Emery, 1985) have appeared, and the reader is referred to these for a detailed discussion of this issue. It is important to note that Wolfe (1985) has reviewed literature indicating that the relationship between marital problems and child problems also exists in child-abusing samples.

For the purposes of this chapter, one study is presented, and then some conclusions from one review (O'Leary & Emery, 1985) are summarized. Oltmanns, Broderick, and O'Leary (1977) conducted a study with 37 nonclinic families and 62 clinic-referred families whose children were demonstrating various types of behavior problems. Marital adjustment was assessed by the Short Marital Adjustment Test, and child behavior problems were assessed by the parents' completion of the Behavior Problem Checklist (Quay & Peterson, 1979). The latter measure yields four factors: conduct disorder, personality disorder, inadequacy-immaturity, and subcultural deviance. There were significant correlations ( $-.31$  to  $-.37$ ) between the marital measure and each factor of the Behavior Problem Checklist. In all cases, the correlations indicated that, with decreases in marital satisfaction, there were increases in parent-reported child problems.

Like the literature concerning parental depression, that addressing the relationship between marital adjustment and child behavior problems is limited by its reliance on parent report (perceptions) of child behavior. Nevertheless, a number of general conclusions were reached by O'Leary and Emery (1985) after they thoroughly reviewed the available literature. Among the conclusions are the following: (1) the relationship between marital and child problems is stronger in clinic than in nonclinic populations; (2) males are affected more by marital problems than females; (3) aggression is the primary problem demonstrated by males in association with marital difficulties; and (4) overt marital hostility is associated with more behavior problems in males than is general marital satisfaction. It is important to note that O'Leary and Emery did *not* view the available data as supporting Framo's conclusion (1975) that, whenever there is a disturbed child, there is always a disturbed marriage.

Not only may marital problems be associated with child behavior problems, but divorce can also be associated with such problems. Hetherington, Cox, and Cox (1978, 1979), among others (see Atkeson, Forehand, & Rickard, 1982, for a review), reported that children, particularly males, display an increased level of disruption and aggression during the first two years after experiencing a divorce. Although the longer term effects of divorce are not clear at this time, most investigators have hypothesized that a decrease in problem behaviors occurs after two years.

Attention has been turned to identifying those variables that may mediate a child's successful or unsuccessful adjustment to a divorce. Parental conflict appears to be a particularly important mediator (see Atkeson *et al.*, 1982). In fact, Long, Forehand, Fauber, and Brody (1987) found that, although both divorce and parental conflict influence child adjustment, the latter variable is the more potent one. Whether a child is in a two-parent or a one-parent family, it would appear important to consider ongoing interparental conflict and discord.

### *Extrafamilial Difficulties*

Parents may experience difficulties not only with personal and/or marital problems but also in interactions outside the family. Such stresses may be associated with problem behaviors of the children in these families. Wahler has been the primary investigator interested in this relationship, and one of his studies is reviewed as illustrative of the work in this area.

Wahler and Afton (1980) identified two groups of parents: those with infrequent and aversive interactions outside the home and those with frequent and positive interactions outside the home. The former group was termed "insular" and the latter "noninsular." Baseline observations in the homes of these two groups by independent observers indicated that children from insular families displayed more oppositional behavior than those from noninsular families, a finding suggesting that factors outside the home that affect the parents are related to the occurrence of child behavior problems in the home. In other work, Wahler (1980; Dumas & Wahler, 1985) found that parental interactions outside the home were related not only to the child's behavior but also to the parent's aversive behavior toward the child in the home. This finding suggests that extrafamilial difficulties may lead parents to change their behavior toward their child, a change that then leads to changes in the child's behavior.

It is important to note that Wahler's instrument for measuring insularity is a self-report one. Therefore, as with parental personal adjustment and marital dysfunction, our knowledge of the effects of extrafamilial difficulties on children is limited by our assessment methodology.

### *Conclusions*

The literature reviewed in the four preceding sections suggests that parenting skills, parent depression, marital dysfunction, and extrafamilial difficulties are associated with disturbances in some aspects of the parent-child relationship. As noted earlier, parenting skills were initially viewed by behavior therapists in the 1960s and 1970s as being the primary difficulty when child behavior problems existed. However, the more recent research reviewed above implicates personal, familial, and extrafamilial factors. It appears that one or more of these factors *may* be related to parent perceptions of child adjustment, parenting skills, and/or child behavior.

At this time, substantial additional work in this area is needed. Some of the issues that should be addressed are as follows. First, we have little evidence about cause-effect relationships between the areas of family functioning and child behavior problems. It is as likely that child problems, for example, cause marital problems as that marital problems cause child problems. Second, assuming that child behavior is caused by one of the family distress factors, we do not know, with the exception of the Forehand Lautenschlager, Faust, and Graziano (1986) study, if there is a direct cause-effect relationship (e.g., between marital problems and child problems) or an indirect cause-effect relationship (e.g., marital problems causing poor parenting skills, which cause child problems).

For example, Emery (1982) pointed out that marital conflict may be associated with an elevated level of child behavior problems because of a modeling effect (parental conflict may cause a child display of conflictual or disruptive behavior) or a disruptive influence on appropriate parenting skills (parental conflict may cause poor parenting which may cause a child display of conflictual or disruptive behavior). Third, assuming a causal relationship, we have minimal data on the long-term effects of the various factors on child behavior. One might ask if the effects on child behavior are reversible if marital problems (depression) dissipate? Fourth, as noted previously, most of the literature in the personal and marital distress areas has relied on parent reports of personal problems (e.g., depression) *and* of child behavior problems. This reliance on parent reports results in common method variance and probably inflates the correlations obtained. Fifth, almost all of the data on parents are actually on mothers only. The role of the father in the family needs to be assessed.

Sixth, there are few data to indicate if difficulties in the various areas of family functioning reviewed are associated with similar or different aspects of child behavior. For example, extrafamilial difficulties may be associated with child disruptive behavior, whereas depression may be related to parental perceptions of child behavior. Furthermore, if different areas of family functioning are associated with the same aspect of child behavior, is the presence of difficulties in two or more areas additive, so that there is more disruption in child behavior with problems in two (three) areas than in only one area of family functioning? This issue has been addressed in several recent studies. In a study that is indirectly related to this question (because child behavior served as an independent rather than a dependent variable), but that has important implications, Brody and Forehand (1985) reported that depression and child behavior interact to influence parent perceptions of child adjustment. That is, when a mother reports a high depression score and her child displays a high level of deviant behavior, she perceives the child as more maladjusted than when the combination of a high depression score with a low level of deviant behavior or of a low depression score with a high level of deviant behavior exists. These data, as well as those given by Forehand, Brody, and Smith (1985a) regarding the interaction of marital satisfaction and child behavior, emphasize the importance of looking beyond a single variable in identifying the determinants of parent perceptions of child adjustment.

In another study by Forehand and Brody (1985), the single and interactive effects of two family areas, marital adjustment and parent depression, were examined. Marital adjustment was related only to the behavioral measure of child compliance, whereas depression was related only to parent perceptions of the child. However, recall that, in the Forehand, Lautenschlager, Faust, and Graziano (1985) study, there was an *indirect* link between depression and child behavior through parent behavior. Nevertheless, the results of the Forehand and Brody study suggest that marital satisfaction and maternal depression are associated with different aspects of the parent-child relationship and, therefore, that both aspects need to be examined during the clinical assessment of the families of referred children. An interaction of marital satisfaction and depres-

sion was not found. However, as the sample size was quite small, additive effects were not adequately tested.

The systematic assessment of family functioning when child psychopathology is the primary concern is a relatively new area of *empirical* investigation. Clearly, substantial additional research is needed.

## ASSESSMENT: PREADOLESCENTS

The literature reviewed in the preceding section indicates the need to assess multiple areas of family functioning when a child is referred for psychological treatment. This section reviews the instruments that can be used in each area to assess preadolescent children (approximate ages of 3–10).

### *Parenting Skills*

The initial indicator of difficulties in parenting skills is the parents' verbal report of being frustrated in their interactions with their child. Particularly, concern about how to handle various problem behaviors displayed by the child is a key indicator of parenting-skill deficits. Parents typically report using multiple procedures (e.g., threatening, pleading, spanking, yelling, and removal of privileges) ineffectively to handle multiple problem behaviors (e.g., non-compliance, aggression, and tantrums) occurring in multiple situations (e.g., at bedtime, at mealtime, and while grocery shopping).

Based on these verbal reports by parents, a systematic assessment of parenting skills can occur. Although various assessment strategies are available from different clinical researchers (e.g., Budd & Fabry, 1984; Patterson, 1982), the package recommended by Forehand and McMahon (1981) is described here. As Routh (1985) noted, this program for noncompliance is the one with the strongest research base. The procedures used in this package to assess parenting skills consist of a parent interview and behavioral observations. Parental perceptions of child adjustment and parental personal, marital, and extrafamilial adjustment are also assessed as part of the program. The instruments used in this regard are described in subsequent sections. It should be noted that similar instruments are used when child abuse is suspected. For more specific details on assessment with this population, the reader should see Friedman, Sandler, Hernandez, and Wolfe (1981) and Wolfe (1985).

### *Parent Interview*

The parent interview involves asking parents about a standard set of situations in which young children often display behavior problems: bedtime, mealtime, shopping, guests in the home, visiting outside the home, bathtime, parent talking on telephone, and peer interactions. For each situation, the parent is asked if the child demonstrates behavior problems and, if so, to describe the

child's behavior. Of critical importance is how the parent reacts to the child in each situation. That is, how does the parent attempt to handle the problem behavior and how consistent is the parent in her or his response to the child's behavior. Typically, such an interview can be conducted in 35–40 minutes and gives the interviewer information about the types of problems the child displays in various situations and the skills that the parent has for addressing the problems. More details on the interview format, as well as a problem guidesheet for conducting this part of the assessment, are provided in Forehand and McMahon (1981). It is important to note that, although this type of interview is used with parents of 3- to 9-year-old children, the same format could be used with older children by changing the situations (e.g., from bedtime to curfew time).

Although a child interview is frequently used also, especially for children 6 years and older, the details of this interview are not given here, as its content focuses on child behavior rather than on parenting skills. The interested reader should see Atkeson and Forehand (1981).

### *Observational Assessment*

In most research programs, trained independent observers collect behavioral data in the home. Such observations allow the assessment of child and parent behavior in the natural environment. Although home observation data provide valuable information, the time and expense involved in such procedures will probably prohibit most clinicians from using this assessment method. Therefore, observations can be conducted in the clinical setting. The procedures for this type of assessment are as follows:

In the clinic, the therapist can construct situations that resemble those that cause problems in the home. Such situations with a 3- to 9-year-old could involve two adults talking to one another in the child's presence, the mother working on a task (e.g., a grocery list) when the child has been instructed to play quietly, and the parent instructing the child to clean up his or her room. As will be discussed in a later section, problem situations with older children, such as conflict about a curfew time, friends, or hair length, could be used by instructing the parent and the adolescent to discuss each area and to reach a resolution.

With 3- to 9-year-old children, we have typically used two general interactional situations and, when necessary, also specific situations like those mentioned in the preceding paragraph. The two general conditions consist of the Child's Game and the Parent's Game. In the former, the parent is instructed to "do whatever activity the child selects to do." In the latter, the parent is instructed "to be in charge and select the activity." From behind a one-way window or while sitting in the corner of the therapy room, the therapist observes the parent and the child for 5 to 10 minutes in each condition.

The coding system used in the clinic (and in the home), as well as its reliability and validity data, is presented in detail in Forehand and McMahon (1981). The following classes of parent behaviors are recorded: rewards (positive evaluations of the child's behavior); attends (descriptions of the child's behavior); questions (interrogatives requiring a verbal response); commands (instruc-

tions requiring a motoric response); warnings (statements describing an impending aversive consequence); and time-out (a procedure that removes a child from positive reinforcement). The child behaviors that are recorded are compliance (an appropriate motoric response within 5 seconds to a command); noncompliance (failure to emit an appropriate motoric response within 5 seconds to a command); and inappropriate behavior (whine, cry, yell, aggression, and deviant talk). What the therapist typically examines in these interactions is the child's positive and negative behaviors and the skills displayed by the parent as antecedents and consequences of these behaviors. In regard to parenting skills, in the Child's Game a high rate of rewards and attends and a low rate of commands and questions are desirable. In the Parent's Game, clear and concise commands are desirable, as well as rewards for compliance and use of time-out for noncompliance and other inappropriate behaviors.

### *Parent Perceptions of Child Adjustment*

Parent perception of child adjustment is the best discriminator between clinic-referred and nonclinic children (Griest *et al.*, 1980; Lobitz & Johnson, 1975). Furthermore, behavioral change by a child who has received psychological treatment is not sufficient if his or her parents still see him or her as maladjusted. Therefore, it is important to assess parent perceptions of child adjustment before initiating treatment and again after treatment. The parent interview is an initial step for the clinician to use to gain some insight into how a parent perceives his or her child. A more in-depth examination of parent perceptions of child adjustment can be undertaken by use of parent-completed questionnaires regarding child adjustment.

Although there are a number of standardized questionnaires (for reviews, see Atkeson & Forehand, 1981; McMahan, 1984), we have chosen to use primarily the Parent Attitude Test (Cowen, Huser, Beach, & Rappaport, 1970) in our work. The main reason for this choice was that this instrument samples parents' global impressions of the child and a few specific child behavior problems, whereas most instruments sample only the latter. We have used three scales from the Parent Attitude Test. The Home Attitude Scale consists of 7 items that reflect the parent's global perceptions of the child's adjustment in the home. The Behavior Rating Scale consists of 23 items, each of which refers to a behavior problem, and the Adjective Checklist Scale consists of 34 adjectives, each describing a child behavior or personality characteristic. Cowen *et al.* (1970) presented evidence demonstrating the reliability and validity of these scales. In terms of normative data, Cowen *et al.* reported that children functioning in the upper two-thirds and those in the lower one-third of their class in terms of adjustment (as determined by teachers) had the following parent-completed scale scores: Home Attitude, 6.86 (upper two-thirds) and 8.16 (lower one-third); Behavior Rating, 12.96 and 15.68; and Adjective Checklist, 17.79 and 21.90. Griest *et al.* found that clinic-referred and nonclinic children had the following scale scores: Home Attitude, 14.4 (clinic-referred) and 5.6 (nonclinic); Behavior Rating, 29.6 and 12.6; and Adjective Checklist, 31.3 and 16.4.

The Parent Attitude Test is useful in that it provides the clinician with the parent's global perception of his or her child. The scale does differentiate between clinic and nonclinic children (Forehand *et al.*, 1975; Griest *et al.*, 1980) and does change in a positive direction with behavioral parent training (e.g., Forehand, Wells & Griest, 1980). Therefore, this instrument should be given consideration for clinical use.

When one is interested in the parent's report of specific child behavior problems rather than in global perceptions, the Revised Behavior Problem Checklist (RBPC) (Quay & Peterson, 1983) is one instrument to consider. This inventory has 89 items that can be completed by parents *and* teachers, thus allowing an examination of child behavior across settings. The RBPC has six derived factors: conduct disorder, socialized aggression, anxiety-withdrawal, attention problems-immaturity, motor excess, and psychotic behavior. Quay and Peterson (1983) presented extensive reliability and validity data as well as norms for male and female children in kindergarten through eighth grade. In addition, Quay and Peterson gave some norms for high-school-aged students, which are too extensive to present here. It should be noted that, although some norms are based on parent-completed checklists, most of the normative data were provided by teachers.

### *Parent Perceptions of Personal, Marital, and Extrafamilial Adjustment*

Personal, marital, and extrafamilial adjustment are considered in this section, as the three areas are assessed initially and in depth in a similar way. During the initial interview, the clinician can observe for signs of depression (apathy, little affect, and negative verbalizations about oneself) in the parents and, if both parents are present, signs of marital dissatisfaction (frequent disagreement, little communication, and verbal expression of discontentment with the spouse). The observations may be followed with direct questions about these two areas, as well as about extrafamilial support (e.g., extended family, church, and participation in social events outside the home). We have found that parents are typically responsive to and honest about issues in each area. Such questions are asked following the interview regarding child problems and are introduced by simply stating, "We like to conclude the interview by asking several questions about you and your family in general." Then, we pose questions concerning each parent's personal, marital, and extrafamilial adjustment.

For a more in-depth and systematic assessment, parent-completed measures are used. As depression is a major personal adjustment problem, the primary measure used is the Beck Depression Inventory (Beck, Rush, Shaw, & Emery, 1979). The Beck scores correlate significantly with clinicians' ratings of depression (Metcalf & Goldman, 1965) and with objective behavioral measures of depression (Williams, Barlow, & Agras, 1972). Furthermore, the inventory differentiates parents of clinic-referred and nonclinic children (Griest *et al.*, 1980) and demonstrates positive changes with the implementation of a parent training program (Forehand *et al.*, 1980). The Beck inventory consists of 21 items, each of which is scored as 0, 1, 2, or 3. A higher score indicates more depression. Beck

has given the following cutoff points: 0–9, no depression or minimal depression; 10–14, borderline depression; 15–20, mild depression; 21–30, moderate depression; 31–40, severe depression; 41–63, very severe depression. The questionnaire is presented in Beck *et al.* (1979).

Locke's Marital Adjustment Test is the primary questionnaire that has been used in much of the clinical research on marital discord. It is a reliable instrument that has been shown to discriminate between distressed and nondistressed couples (Locke & Wallace, 1959). Furthermore, marital distress as measured by the Marital Adjustment Test has been found to be significantly correlated with deviant child behavior (Johnson & Lobitz, 1974). Finally, a slightly modified form of the test yields scores that are stable over an extended period of time (i.e., 2¼ years) (Kimmell & Van Der Veen, 1974). The modified version of the questionnaire consists of 44 weighted items. A high score on the questionnaire indicates a greater degree of marital satisfaction. The following means and standard deviations were obtained by Kimmel and Van Der Veen for a sample of 149 wives and 157 husbands: wives—mean = 108.40, *SD* = 16.32; husbands—mean = 110.22, *SD* = 16.28. The questionnaire and the scoring instructions are presented in Kimmel and Van Der Veen (1974).

More recently, the O'Leary-Porter Scale (OPS) was developed to assess the frequency of overt parental conflict that occurs in front of the child (Porter & O'Leary, 1980). This type of marital dissatisfaction has been viewed as the most detrimental for children by most investigators (e.g., Emery, 1982). Each of the 10 items on the scale are rated by parents along a 5-point Likert-type scale with end points labeled "Very Often" and "Never." Total OPS scores can range from 0 to 40, with lower scores indicating greater conflict. Porter and O'Leary (1980) reported that the test-retest reliability of the OPS over a two-week period was .96. The correlation between the OPS and the Marital Adjustment Test was found to be .63. Work by Long *et al.* (1987) with 90 nonclinic parents of 11- to 14-year-olds found a mean of 28.

Wahler (1980) developed a measure of extrafamilial relationships. His instrument, called the Community Interaction Checklist, is a means of prompting parent recall of extrafamily social interactions over the past 24 hours. Each parent is asked about contact within the framework of several categories: identity of the contact person (friend, kinfolk, or helping-agency representative); who initiated the contact (self or other); and the valence of the contact for the parent (7 = bad; 1 = good). Finally, the parent is asked to estimate the total number of hours (excluding sleep) during which the parent had direct caretaking responsibilities for the target child (Wahler, 1980).

Wahler (1980) found that scores on the Community Interaction Checklist correspond moderately well with parent-child observational data. No reliability data have been reported. In terms of norms, Wahler, Leske, and Rogers (1979) reported that insular mothers (those with few social contacts, which were primarily aversive in nature) had an average of 2.6 daily extrafamilial contacts, 30% of which were with friends. In contrast, noninsular mothers had 9.5 extrafamilial interactions, 58% of which were with friends.



## ASSESSMENT: ADOLESCENTS

The assessment of families with adolescents involves the same general procedures as those used with preadolescents. That is, an interview, behavioral observations, perception measures, and personal, interparental, and extrafamilial functioning can be examined. The primary difference is that, when adolescents are the source of concern, the adolescents can be interviewed and can complete questionnaires more reliably than can younger children. Also, although the same general procedures are used with preadolescents and adolescents, the specific instruments do vary.

### *Parenting Skills*

As with young children, the initial indicator of difficulties in parenting skills is the parent's report of frequent conflictual interactions with her or his adolescent. These conflicts can range from everyday interactions (e.g., keeping one's room clean) to more severe difficulties (e.g., adolescent drug use). It is important to note that Montemayor (1984) reported that most parent-adolescent conflicts focus on commonplace types of behaviors (e.g., schoolwork, friends, and chores). Based on parental report of frequent and/or severe conflict with an adolescent and an acknowledgement of not having appropriate skills to handle the conflict, a more thorough assessment of parenting skills can be undertaken. For our purposes, as with younger children, interview and observational procedures are examined. In addition, one parent and adolescent self-report (perceptual) measure is reviewed. As the instruments for assessing personal, marital, and extrafamilial difficulties are the same as those used with younger children, their description is not repeated here.

### *Interview*

The interview procedure presented here is based on the model used by Robin and Foster (1985; Robin, Koepke, & Nayar, 1985). Only the primary steps in the interview process are presented. The interested reader can obtain more information from the references cited.

The interview is conducted with both parents and the adolescent. Initially, each family member is given 5–10 minutes to relate his or her view of the problems. As part of this process, the therapist poses questions to each family member in an attempt to assess the issues and the intensity of conflict, as well as their antecedents and consequences. The Issues Checklist (Prinz, Foster, Kent, & O'Leary, 1979), to be described later, can be used by a therapist to discover potential parent-adolescent conflictual areas if family members have difficulty initiating the discussion of problem areas. The historical antecedents of the current problems (e.g., how and when the problems began and how they have evolved over time) are also examined. The positive characteristics of the family, as well as individual and interpersonal difficulties, are examined through ques-

tioning. Individual difficulties include adolescent problems (e.g., attention deficit disorder or conduct disorder) and parent problems (e.g., depression, anxiety, or substance abuse), and interpersonal difficulties consist of marital discord.

The therapist also uses the interview to gather further information about the family structure and how the family functions. For example, coalitions between particular family members (e.g., mother and daughter against father) can be assessed by observing how the family selects to sit in the session, by posing selected questions and observing which family members respond similarly, and by offering hypotheses about the family or its various members in order to see "who sides with whom" in support of or against the hypotheses. The therapist then concludes the interview by providing the family with some feedback and by outlining the nature and process of treatment.

### *Observation*

As with younger children, observational data with parent-adolescent interactions can be collected at home or in the clinic. In both places, selected issues are posed to the family, and how these are resolved is examined (Robin *et al.*, 1985). Two types of tasks are used: (1) resolving a particular conflictual issue (which can be selected from the interview or the self-report questionnaires) and (2) planning a family event.

Typically, the interactions are audiotaped or videotaped and are later rated in one of two ways. Each interaction can be listened to and rated (occurring vs. not occurring) on 33 problem-solving communication behaviors (e.g., interrupting with criticism, making suggestions, name calling, sarcasm, or praising) displayed by each family member. Adequate reliability and validity data have been reported (e.g., Robin & Foster, 1985).

When more specific information, such as the frequency of occurrence of behaviors and their antecedents and consequences, is needed, Robin *et al.* (1985) recommended using the Parent-Adolescent Interaction Coding System (PAICS). This system allows the verbal behavior of both parents and adolescent to be classified into 1 of 15 categories (e.g., problem solution, agree or assent, putdown, or specification of the problem). Again, adequate reliability and validity data have been presented (see Robin & Foster, 1985; Robin *et al.*, 1985).

### *Parent-Adolescent Self-Report Measures*

In contrast to the procedure used with younger children, self-report or questionnaire-completed measures of the problem areas are usually obtained from parents *and* the adolescent. Although a number of inventories are available (for an extensive list of such instruments, see Robin & Foster, 1985; Robin *et al.*, 1985), one instrument, the Issues Checklist (Robin & Foster, 1985), is reviewed here. This instrument lists 44 issues (e.g., curfew, chores, and drugs) that may be areas of conflict between parents and adolescents. Each family member indicates independently whether a particular issue has arisen in the past four weeks. For those issues that have occurred, the individual rates the intensity of the

discussion on a 5-point scale (1 = calm; 5 = angry). Three scores can be derived: the number of issues, the mean intensity level of discussions, and a weighted average of frequency by intensity level. This instrument can give the therapist a picture of the individual issues facing a family with an adolescent, a composite score of the frequency and intensity of issues, and the agreement or disagreement among various family members' views of the conflictual issues.

Robin and Foster (1985) presented adequate reliability and validity data, as well as some normative data. They reported the following scores for non-distressed families: number of issues—mother-completed (17.8), father-completed (11.6), adolescent-completed regarding issues with mother (18.5), and adolescent-completed regarding issues with father (10.7); mean intensity score—mother-completed (1.7), father-completed (1.8), adolescent-completed regarding issues with mother (1.8), and adolescent-completed regarding issues with father (1.75); and weighted average of frequency by intensity—mother-completed (.83), father completed (1.94), adolescent-completed regarding issues with mother (.84), and adolescent-completed regarding issues with father (1.88). A comparison of a sample of nondistressed families with a sample of distressed families indicated that, for all measures, the distressed families reported more difficulties in the derived scores. Robin and Foster (1985) also presented reliability and validity data.

## CONCLUSIONS

The American family is in a state of flux at the present time, as stresses are evident both internally and externally. One job for professionals who are concerned with the development and health of children is to study, assess, and treat faulty family processes that can adversely affect children. To be blunt about the present state of affairs, we have only begun to identify those faulty processes. For years, the behavioral movement assumed that poor parenting skills led to deviant child behavior; however, although a number of treatment programs based on this assumption developed, few data were available to suggest exactly what parent behaviors should be changed. We now have data to suggest that commanding and negative behaviors differ between conduct-disordered and normal children and, therefore, that these presumably should be changed. Even more recently, we have found data to suggest that parental depression, marital discord, and extrafamilial difficulties are associated with faulty parent perceptions and, at least on some occasions, with poor parenting and/or elevated child deviant behavior. For the most part, our understanding of the role of these factors (e.g., depression), other than the actual parent-child interaction, is limited by the exclusive use of self-report measures.

On the positive side, empirically oriented researchers and clinicians, such as behavior therapists, now are realizing that a host of factors can impinge on the family and can influence the psychological health of a child. In many cases, it is not sufficient simply to assess and treat the parent-child interaction. Other aspects of family members, such as depression and marital discord, need to be

assessed systematically and, when necessary, treated. This process is occurring more often in treatment programs designed to assist parents with deviant child behavior (e.g., Griest, Forehand, Breiner, Rogers, Furey, & Williams, 1982). An important role for researchers is to continue to develop methods to assess these factors, which may influence parenting practices and/or child behavior. In particular, movement beyond the reliance on parent self-report inventories is needed.

It is important to stress that deviant child behavior does not automatically mean the existence of parent personal or marital pathology. Nor does the coexistence of parent personal and marital problems with deviant child behavior mean that the former caused the latter. For the most part, our data at this time simply do not allow us to reach a conclusion on causality. We must continually be aware of this point in both our clinical and our research efforts.

When personal, marital, or extrafamilial distress exists concomitantly with faulty parenting skills, what should a therapist do? Forehand *et al.* (1984) identified three alternative treatment strategies. First, the therapist may proceed with the treatment of child deviance, through procedures such as parent training, and may monitor the parent's distress. Some of our data suggest that parent training is associated with decreases in maternal depression (Forehand *et al.*, 1980) and, for mothers with low marital satisfaction, with a temporary increase in marital satisfaction (Forehand, Griest, Wells, & McMahan, 1982). Second, the therapist may address the distress factor before beginning, or instead of, the treatment of child problems. Third, the therapist may focus on parenting skills and the maternal distress concurrently (e.g., Griest *et al.*, 1982). At this point, data are not available to suggest that one approach is superior to another. However, two factors readily come to mind in considering which approach to take:

First, the initial level of maternal distress and child-deviant behavior should be considered. When distress is high and child behavior problems are low, the second option would appear to be most appropriate. When child-deviant behavior is high and distress is moderate, the first strategy would appear to be an attractive one. When child-deviant behavior and distress are both high, the third alternative may be chosen.

A second factor to be considered when deciding on a treatment approach is the parent's willingness to accept help for these sources of distress. We have found that most parents who approach therapists for treatment of their children's behavior problems are interested in assistance in changing all aspects of the family that are producing distress. However, some parents readily voice their desire to work only on child behavior problems and sabotage any attempt to address their own problems. The initial assessment procedure should certainly include a determination of parental desire and willingness to work on issues beyond the child's behavior. If a parent is not willing to focus on personal, marital, or extrafamilial issues, the therapist needs to estimate, to the extent possible, the probability of successfully treating the child behavior problems by addressing only these difficulties. This information then can be communicated to the parent, who, in conjunction with the therapist, can decide whether to initiate treatment of the child's behavior problems.

The family is viewed by some as the most important social institution in our society (e.g., Fortune, 1985). For professionals interested in children, it is imperative that the family be considered when concerns about child psychopathology exist. Hopefully, this chapter has provided some data about the role of family factors and some suggestions for ways to assess these factors.

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# IV      Assessing Special          Populations



# 20      *Mental Retardation*

MELANIE L. MCGRATH AND JEFFREY A. KELLY

One of the most frequent reasons for referring a child for assessment is to ascertain the youngster's intellectual functioning level. Quite often, in the case of children with apparent developmental lags, the purpose of assessment is specifically to evaluate whether the child is mentally retarded. In this chapter, we consider in detail the assessment for mental retardation. The characteristics and definitions of mental retardation will first be briefly considered; attention will then be given to standardized and behavioral assessment procedures.

## POPULATION CHARACTERISTICS

Both the American Association on Mental Deficiency (AAMD; Grossman, 1977) and the third edition of the *Diagnostic and Statistical Manual* (DSM-III; American Psychiatric Association, 1980) have pinpointed three essential criteria for mental retardation: (1) significantly subaverage general intellectual functioning; (2) deficits in adaptive behavior; and (3) onset before the age of 18. Significantly subaverage general intellectual functioning is operationally defined as two or more standard deviations below the mean on standardized intelligence tests such as the Wechsler scales or the Stanford-Binet. This criterion is equivalent to an IQ score below 69 or 70, depending on the specific testing instrument used.

The second component of mental retardation, deficits in adaptive behavior, refers to the large set of behaviors that individuals generally need in order to function adequately in society. These behaviors vary with the age group of the individual but include self-care, motor ability, and occupational, communication, socialization, and self-control skills. Taking into account adaptive behavior deficits in the definition of mental retardation has been useful because it has helped to bridge the gap between diagnosis, based on an IQ score alone, and intervention. The purpose of assessment should not be simply diagnostic categorization; it should also be the identification of skill behaviors that will require training and modification in educational and habilitative programs for the men-

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tally retarded child. Thus, if the addition of behavioral deficits to the definition has not greatly influenced the traditional retardation-level labeling process, it has shifted the focus of assessment from solely labeling a child by IQ score to assessing, as well, the presence of adaptive behavior deficits.

Characteristics other than intellectual and adaptive behavior deficiency may be associated with mental retardation. Aggressiveness, noncompliance, tantruming, and other behavior problems sometimes accompany mental retardation. Neurological abnormalities may be present that involve neuromuscular functioning, sensory functioning, or seizures. Further, other disorders such as stereotyped movement disorder, infantile autism, and attention deficit disorder with hyperactivity are three to four times more common among mentally retarded individuals than in the population at large (American Psychiatric Association, 1980). The DSM-III requires the professional to investigate the possibility of specific or pervasive developmental disorders and borderline intellectual function before the diagnosis of mental retardation may be assigned. However, the diagnosis of mental retardation may coexist with the diagnosis of specific or pervasive developmental disorders.

Estimates of the prevalence of mental retardation have ranged from 1% of the population (American Psychiatric Association, 1980) to 6%–9% (Kolb, 1973), depending on the definition used. However, the Office of Mental Retardation Coordination (1972) estimated that approximately 3% of the population meet the criteria for mental retardation. Further, mental retardation is twice as common in males as in females.

Four subtypes of mental retardation have traditionally been described, each reflecting the degree of a child's intellectual handicap. The labels associated with these categories are *mild*, *moderate*, *severe*, and *profound mental retardation*. The mildly mentally retarded group, which includes 80% of the individuals labeled as mentally retarded, is characterized by an IQ score of between 50 and 70. These individuals are generally considered "educable," or able to obtain the basic academic skills equivalent to the third- to sixth-grade level. Physical abnormalities are not generally evident. Mildly mentally retarded children do not function academically as well as their peers, and they exhibit difficulty in independence and responsibility. The moderately impaired category comprises 12% of the total population of mentally retarded persons and includes individuals with IQ scores between 35 and 49. These individuals are considered "trainable," or capable of unskilled or semiskilled work under supervision and capable of basic communication skills. Physical deficits and coordination problems are more common among moderately impaired children, and they often look and act in a manner noticeably different from that of other children. The severely mentally retarded category includes persons with IQ scores ranging from 20 to 34, approximately 7% of the mentally retarded population. Little or no communication, physical and neurological deficits, and poor social development characterize this group. Elementary hygiene skills and self-care skills may be attained. An IQ score below 20 is labeled *profound mental retardation*. Less than 1% of those persons labeled as mentally retarded are considered profoundly impaired. The

individuals in this category usually require constant attention and may acquire extremely limited self-care skills. Communication and neurological deficits are common.

These categories have value to the extent that they broadly predict the highest level of functioning that can be attained by the individual. However, the global categorization of a child based on IQ score alone may obscure important information on the child's specific skills, capabilities, and potential for learning adaptive behavior. The mentally retarded child may exhibit many combinations of deficits and strengths. For example, an individual who has a Full Scale IQ score that falls into the moderately impaired category may have a Verbal IQ score in the mildly mentally retarded range but may not gain placement access to the same learning opportunities as an individual with the same Verbal IQ whose Full Scale IQ score is in the mildly mentally retarded range. Further, it is a misuse of classification to assert that an individual with an IQ of 49 (moderate retardation) is incapable of some basic academic work, but that one with an IQ of 50 (mild retardation) is quite capable. Clearly, adaptive skills should be considered before placements and educational decisions are made. This factor is especially important because IQ and adaptive skills are not perfectly correlated, and in some instances, an individual of lower IQ may be capable of a higher level of adaptive functioning than one of a higher IQ. In summary, the group labeled *mentally retarded* comprises a varied and heterogeneous group with a great diversity in abilities and deficits.

There are numerous known and postulated causes of mental retardation. These may be subdivided into two categories: cultural-familial and genetic-physiological. Cultural and familial factors have been proposed to affect individuals less severely; the mental retardation levels are in the upper functioning range of mild to moderate impairment. Mild mental retardation is often not accompanied by any known genetic or physiological impairment and may represent the lower end of the naturally occurring IQ distribution. A family background that includes substandard education, low levels of cognitive stimulation, and general impoverishment may contribute to the development of mental retardation (Robinson & Robinson, 1976; Bijou, 1963) and may help to account for the strong correlation between poverty and cultural-familial mental retardation (Beck, 1983; Voght, 1973). Thus, poor living conditions and fewer learning opportunities may put children at greater risk for cultural-familial retardation.

The genetic and/or physiological factors in mental retardation include chromosomal aberrations, metabolic disturbances, and complications of pregnancy or delivery. Chromosomal defects such as Down's syndrome, Turner's syndrome, or Klinefelter's syndrome are the result of atypical cell division involving either the sex chromosomes (Turner's and Klinefelter's) or the somatic chromosomes (Down's syndrome). Down's syndrome, or trisomy 21, is the most prevalent cause of moderate to severe mental retardation. The risk of Down syndrome increases with the mother's age. Among mothers over 45 years old, the incidence is 1 in every 40 births, whereas the rate is one in every 700 births for mothers under age 35 (Beck, 1983).

Metabolic disorders causing mental retardation include phenylketonuria (PKU) or defective lipid metabolism (Tay-Sachs disease). Severe malnutrition, chronic infection, toxicity, or trauma can also produce impaired intellectual functioning.

## INTERVIEWING

As one might expect, children with substantial degrees of mental retardation can usually be identified at an earlier age than children with only mild intellectual impairment; children with mild mental retardation may not be seen for evaluation until they begin school. Typically, caretakers, such as parents and teachers, who are most knowledgeable about the child's behavior, developmental milestone attainment, and task performance are usually the most accurate interview informants. We consider here some aspects of the caretaker interview that can provide initial information about the youngster. Interviews alone are insufficient to assess mental retardation and are always followed by standardized testing of intelligence, assessment of the child's present adaptive behavior in various specific areas, and assessment of any maladaptive behaviors and special needs.

### *Interview Assessment of Prenatal, Postnatal, and Health-Related Factors*

The initial parent interview usually begins with a review of circumstances related to the mother's pregnancy, the child's birth and early development, and other health factors. Atypical events in pregnancy (maternal illness, trauma that may have affected the fetus, and maternal medication use during pregnancy) and at the time of birth (delivery difficulties, neonatal trauma or anoxia, or other atypical factors) should be discussed with the parent and, ideally, should be corroborated by obstetrical records. A family history should be obtained, including inquiry into the presence of any developmental disorders among family members. Especially if a metabolic, genetic, or physiological disorder capable of producing mental retardation is suspected, medical consultation with a pediatric specialist should be sought. Conducting a thorough physical examination is prudent if one has not been conducted recently.

### *Interview Assessment for Developmental Delays*

It is important for examiners who assess children for mental retardation to have knowledge of developmental milestones and the ages at which they are normally attained. The caretaker is then interviewed to determine the age at which and the ease with which the child attained milestones in various motor, sensory, language, and self-control areas. Significant delays or difficulties in

such tasks as crawling, orienting toward objects, reaching for objects, visual tracking, walking, speaking single words, speaking phrases, and exhibiting self-care behavior should be noted. Examiners unfamiliar with developmental milestone attainment and the interpretation of developmental delays should consult specialized sources on this topic (see, for example, Knobloch & Pasmannick, 1974).

### *Interview Assessment of Caretaker's Concerns*

Unless a child is routinely screened in conjunction with an early identification program, it is likely that the youngster is being evaluated because someone—a parent, a teacher, or a medical resource—is concerned about the child's development. Examples of these concerns might include apparent developmental delays in some area of functioning, the presence of behavior difficulties unexpected in a youngster that age, unresponsiveness, and school difficulties or academic failure. The interviewer should identify and note those concerns, should attempt to evaluate their severity, and should plan to focus later specialized assessment on them.

A caretaker may or may not be a reliable, accurate source of information about a child's behavior. Some caretakers may expect unrealistically advanced behavior from a child, may become overly worried about the child's development, and may have unnecessary concerns. Other parents fail to report significant child delays and problems because they do not recognize that they are atypical. Interpretation and judgment distortions can be reduced if the interviewer takes into account the knowledgeability of the caretaker informant, attempts to obtain accurate and objective information about the child's behavior, and evaluates the youngster's behavior with reference to normative data on child development.

### *Interviewer Assessment of Environmental Factors*

As mental retardation, especially in the mild range, can have environmental deprivation as one of its contributors, this area should also be explored with the caretaker. Paucity of environmental stimulation, inattention and emotional neglect, isolation from common childhood activities, or other evidence of social stimulation or deprivation should be noted.

Finally, information is solicited from professionals other than the primary caretaker who also know the child. These sources of information may include observations made by the child's teacher, by preschool and day-care staff, or by the youngster's pediatrician. In general, the same areas covered in the caretaker interview (e.g., developmental progress or delays, responsiveness, and interviewer concerns) can also be explored with these other informants. Following interview assessments, the evaluation ordinarily proceeds to standardized intellectual and behavioral assessment of the child.

## STANDARDIZED ASSESSMENT PROCEDURES

### *Special Considerations*

When assessing the mentally retarded child, special advance preparation for the testing situation may be needed. A review of background information about the child can often aid the examiner in planning the session. If the child is physically handicapped, special instrumentation or assistance may be necessary. Information regarding attentional difficulty and behavior problems such as tantruming, aggression, or self-stimulation is useful so that the examiner is prepared to handle any special situations that may arise. Thus, before assessing a mentally retarded child, decisions should be made on room organization (arranged to better accommodate the handicapped or undecorated to decrease distraction), the assessment instruments that will be used (including any special instruments for the sensory-impaired or nonverbal, if needed), and so on. The examiner may also wish to have a supply of food reinforcers to encourage on-task and in-seat behavior and may plan to break up the session with games or gamelike testing instruments and frequent breaks. Because mentally retarded children often exhibit shorter attention spans than other youngsters, scheduling several brief test periods rather than one extended period may yield more valid assessment information.

Once the testing session begins, it is imperative that the examiner take the time to establish a working rapport with the child. This approach is especially important with mentally retarded children, as they may not understand the purpose of the session and may be fearful. Engaging the child in casual conversation can promote interaction with the examiner and feelings of comfort. This method will also encourage more verbalization during the subsequent assessment. As developmentally handicapped children are often accustomed to failure, they may be afraid to answer. Encouraging verbal behavior before formal testing begins will reduce this likelihood. If the child has limited verbal abilities, it may be useful to play a brief game, again to encourage interactions and to establish a feeling of trust in the child.

It is important for the examiner to explain the purpose of the assessment and the kinds of activities he or she will be doing with the child. At this point, it is possible to note the child's level of understanding and to adapt test administration procedures accordingly. For example, certain directions and explanations may need to be rephrased or supplemented with demonstration. The child should be encouraged to ask questions when he or she does not understand a task, and social reinforcement should be used to encourage on-task behavior and to maintain a high level of interaction. Brief games and food reinforcers may also be used to promote on-task behavior and to prevent frustration from extended concentration periods. As mentally retarded children may be acquiescent or afraid to request breaks, the examiner should carefully and frequently observe whether the child needs to take a break. For example, a change in attentiveness, fidgeting, or talkativeness can indicate fatigue or a need to go to the bathroom.

Evaluation of the mentally retarded child requires that the child's performance on an accepted measure of intellectual ability be compared with the known performance of a normative group of children. In most comprehensive, individualized evaluations, standardized tests of several different kinds are used. These include tests of intellectual ability ("intelligence tests"), tests of academic achievement, and tests evaluating the child's present competence in several areas of adaptive behavior. Because the measures used to evaluate intellectual ability, achievement, and adaptive behavior differ, we consider each of them separately.

### *Tests of Intellectual Ability*

As we noted earlier, a child's subnormal performance on an intelligence test was considered the sole criterion of mental retardation. Increasingly, professionals have recognized the need to supplement information on a child's intelligence test performance with assessment data across other areas of adaptive functioning and skill competence. However, in several ways, performance on a measure of intellectual performance remains a major component in the evaluation of a mentally retarded child. First, diagnosing mental retardation requires establishment of the child's IQ score. Second, access to specialized educational programs is often based on IQ. And finally, intellectual test performance remains a reasonably strong predictor of the child's future scholastic and educational success (Anastasi, 1976; Barrett & Breuning, 1983).

A large number of tests exist for assessing intellectual ability. Intellectual assessment measures have been developed for individual administration and group administration; for lengthy evaluations and for brief screening evaluations; for the assessment of specific abilities and for the estimation of a global intelligence quotient. Tests that measure intellectual ability vary in their psychometric characteristics and rigor; some have been standardized with large, diverse samples, whereas other measures have only a modest literature supporting their reliability and validity. Measures of intellectual ability also differ in the extent to which they require the presence of verbal, visual, and sensory skills, and in the extent to which they may be biased against persons with limited exposure to the experiences tapped by scale content (see Anastasi, 1976, for a discussion of these issues).

In our opinion, formal evaluation of a child with suspected intellectual deficits requires the use of a comprehensive, individually administered intellectual assessment measure that has extensive normative data supporting its validity, reliability, and utility for this assessment purpose. These requirements would ordinarily argue against the use of group-administered tests or rapid-administration tests that yield only a single IQ estimation. The tests most widely used for intellectual evaluation of mentally retarded children are the Stanford-Binet (Terman & Merrill, 1973), the Wechsler scales (Wechsler, 1967, 1974), or, for children with severe sensory deficits, specialized scales for those with minimal verbal skills.

### *Stanford-Binet*

The Stanford-Binet (Terman & Merrill, 1973), a test of general intellectual ability, is frequently used with mentally retarded populations because it extends to relatively low levels of ability. Items are administered by age levels, and the test has norms extending from age 2 to adulthood. A mental age score is obtained and is then transformed into an intelligence quotient with a mean of 100 and a standard deviation of 16.

The examiner must have adequate experience and practice with the instrument for smooth administration, as small toys and objects associated with the items at each age level must be easily found and manipulated. The test requires approximately 60–90 minutes to administer and is preferred for younger children or children functioning on a very low level because norms are available down to age 2.

### *Wechsler Scales*

The Wechsler scales (Wechsler, 1967, 1974) tap verbal abilities with the Verbal Scale, perceptual-performance abilities with the Performance Scale, and general intellectual ability with the Full Scale, combining the Verbal and Performance scales. The two Wechsler scales most useful with children suspected of mental retardation are the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) and the Wechsler Intelligence Scale for Children—Revised (WISC-R). The WPPSI allows assessment of children from 3 years, 10 months and 16 days old to 6 years, 7 months and 15 days old. The WISC-R is used for children between the ages of 6 and 16 years. The Verbal, Performance, and Full Scale IQ scores have a mean of 100 and a standard deviation of 15. These scales have limited use for children with substantive impairment because IQ scores cannot be computed below 45 points for the Verbal and Performance Scales and below 40 points for the Full Scale.

### *Specialized Tests for Evaluating Sensory-Impaired Children*

Scales have been developed to tap the intellectual ability of mentally retarded individuals who have limited verbal abilities or other sensory deficits. The Leiter International Performance Scale (Leiter, 1969), for example, requires no verbal instructions or answers. Administration of the Leiter is similar to that of the Stanford-Binet; it taps nonverbal general intellectual ability and may be used with children between the ages of 2 and 18.

The Hiskey-Nebraska Test of Learning Aptitude (Hiskey, 1966) was developed for use with deaf and hearing-impaired children, ages 3–16. With directions given in pantomime, the test yields a learning age and a learning quotient. As the test was standardized on the hearing-impaired, individuals with poor verbal skills and deficient speech are not penalized. Another useful scale for nonverbal children is the Test of Nonverbal Intelligence (Brown, Sherbenow, & Dollar, 1982). This instrument requires no listening, speaking, reading, or writ-



ing, and it was designed for use with language- or hearing-impaired individuals. A measure of general intellectual functioning is provided, and the test taps simple matching, analogues, classification, intersections, and progressions. Useful for individuals from age 5 to adulthood, this scale has been applied to the mentally retarded, the deaf, and other sensory-impaired populations.

### *Achievement Tests*

Achievement tests are used to evaluate the performance of a child in academic and preacademic areas relative to the performance of a normative sample of children at the same age or grade level as the youngster being evaluated. Thus, the results of an achievement test provide the examiner with information on the child's mastery level in school areas such as spelling, mathematics, and language recognition.

Although achievement tests are unavailable for children younger than school age, achievement tests can supplement the results of an intellectual evaluation for children over the age of 5. Although group-administered achievement tests are widely used for mass screening and to make school promotion decisions, it is prudent to use an individually administered test when evaluating a child suspected of mental retardation. The most widely used individual tests of academic achievement are the Peabody Individual Achievement Test (Dunn & Markwardt, 1970) and the Wide Range Achievement Test (Jastak & Wilkinson, 1984).

#### *Peabody Individual Achievement Test*

Several areas important in academic performance are tapped by the Peabody Individual Achievement Test (PIAT; Dunn & Markwardt, 1970): General Knowledge, Spelling, Math, and Reading Recognition and Comprehension. In the Spelling, Math, and Reading Comprehension sections, the child is presented with a task and then chooses the correct solution from among four possible answers. The General Knowledge and Reading Recognition sections require the child to answer the question orally or to pronounce the word presented.

Both grade and age equivalents are available for ages 5 years and 3 months to 18 years and 3 months. These scores may be used to obtain percentiles and standard scores ( $\bar{X} = 100$ ,  $SD = 15$ ). However, because standard scores below 65 are not available, assessment results for young children functioning in the lower ranges may not be easily interpretable. The PIAT can be administered in 30–45 minutes.

#### *The Wide Range Achievement Test—Revised*

The Wide Range Achievement Test (WRAT-R; Jastak & Wilkinson, 1984) assesses reading recognition, written spelling, and computational math skills and yields separate achievement scores for each area. Administration of the WRAT takes 20 to 30 minutes and requires the child to write the word and

compute the problem rather than choosing the correct answer as required by the PIAT. Two level versions of the WRAT are available: Level One is used for children between the ages of 5 and 12 years, and Level Two is used for children 12 years and older. Separate forms are used for the 2 levels allowing younger children to use more developmentally interesting tasks such as counting ducks and boxes. Grade ratings are available and may be converted to standard scores and percentile ranks. Two important changes in the revised WRAT include new norms from a nationally stratified sample and the extension of norms for those 65 to 75 years of age. Because standard scores below 46 are not available, this test's usefulness for substantially impaired children may be limited.

### *Standardized Measures of Adaptive Behavior*

Intelligence tests provide information about a child's intellectual abilities, whereas achievement tests provide information about the youngster's past mastery of school material relative to his or her peers. A third area that can be assessed with standardized measures is the youngster's level of adaptive behavior. Here, the aim of assessment is to determine the child's proficiency in performing various tasks of a self-help, self-control, social, independent, and communicative nature. Most tests of adaptive behavior are standardized so that the child's skill level can be compared with that of a normative group of children the same age. All adaptive behavior assessments entail questioning a parent, caretaker, or other person directly knowledgeable about the child's behavior.

#### *Vineland Adaptive Behavior Scales*

The Vineland, originally developed by Doll in 1935, has been extensively revised (Sparrow, Balla, & Cicchetti, 1984) and taps a child's adaptive skills in such areas as daily living skills, motor skills, communication and socialization as well as assessing the presence of maladaptive behavior. For many years the only test instrument of its kind, the Vineland has long been widely used. Currently, there are three versions: the Interview Edition, Survey Form; the Interview Edition, Expanded Form; and the Classroom Edition. Test items are arranged by age periods and category and items are scored based on a structured interview with the parent or guardian. The examiner scores each competency item as exhibited: 2- yes, usually, 1- sometimes or partially, 0- no, never, N- no opportunity, or DK- don't know. The Vineland utilizes a hierarchical format for developmental competencies from birth to age 19 and above, and provides age equivalents, standard scores and percentiles. A much welcomed addition, the new norms developed for the Vineland also include supplemental norms based on a sample which included the mentally retarded, hearing impaired and visually handicapped.

#### *System of Multicultural Pluralistic Assessment*

Within the System of Multicultural Pluralistic Assessment (SOMPA; Mercer & Lewis, 1977) is the Adaptive Behavior Inventory for Children (ABIC), useful

for children 5–11 years of age. As in the Vineland, an interview is used to rate competencies, and test items are arranged in a hierarchical format within each age group. Six behavioral performance classes are tapped: Family Role, Community Role, Peer Group Role, Non-Academic School Role, Earner-Consumer Role, and Self-Maintenance Role. Relatively modest reliability and validity data have been reported for this scale.

### *Adaptive Behavior Scales*

Developed by the AAMD, the Adaptive Behavior Scales (ABS; Nihira, Foster, Shellhaas, & Leland, 1975) are intended to tap adaptive functioning in the personal, social, and vocational areas. It may be used with individuals ranging from 3 to 69 years of age. Part I of the ABS covers developmental deficits, and Part II assesses the presence of maladaptive behaviors. To complete the measure, the examiner relies on reports made by a knowledgeable informant in the subject's environment. Factor analysis has yielded three factors tapped by the ABS: Personal Independence, Social Maladaptation, and Personal Maladaptation. Percentile scores are obtained that indicate the functional level of the subject when compared to that of institutionalized peers. The ABS is supported by substantial data on its reliability, although the validation data are more modest. This measure is easily administered and is considered one of the most useful instruments to date for assessing adaptive behavior.

## BEHAVIORAL ASSESSMENT

Assessment using standardized measures of intellectual ability, achievement, and adaptive behavior enables the examiner to gauge the performance of a child relative to a normative group of peers in each of these areas. The comprehensive evaluation of a child suspected of mental retardation typically begins with standardized tests of the types just described. However, it is often important to obtain assessment information based on more direct observations of the particular child's behavior. Although some standardized tests (such as the Adaptive Behavior Scale) tap observations made of the child's skills by the parent or caretaker, the examiner may also wish to directly observe the youngster's behavior or to collect systematic assessment data from those who frequently interact with the child.

As the purpose of evaluation is not just to categorize a child but also to gather information relevant to treatment intervention and educational planning, behavioral assessment should be focused on those areas important to the child's successful future functioning. For example, if a youngster is a candidate for a special-education program, are there specific skill strengths, deficits, or behavior problems that will require attention in the classroom? If a child is now in a developmental center program, what adaptive skills need to be enhanced in order for the child to function successfully in less restrictive, more mainstreamed settings? Or if a mentally retarded child is being placed in foster care or for adoption, do behavior deficits or difficulties exist that may require specialized

intervention in the new family? The answers to questions such as these are seldom addressed adequately by standardized test scores alone and require behavioral assessment approaches.

### *Behavior in the Testing Situation*

During the course of standardized test administration, the examiner has an opportunity to note various aspects of the child's behavior. These include the youngster's approach to tasks (such as planned and deliberate, impulsive or random), the child's level and span of on-task behavior, reaction to frustration, comprehension of commands and instructions related to the test measures, and responsiveness to praise and social reinforcement from the examiner. The presence of extraneous behavior, such as fidgety movements, an inability to sit still long enough to complete tasks, or self-stimulatory activity, can also be noted during the testing situation. However, judgments about the significance of such problems should take into account that some off-task behavior is common among most young children in an individual testing situation.

Finally, observations can be made about child characteristics that will require more specialized assessment or consultation with other professionals. Communication or articulation problems observed in the testing setting may call for consultation with a speech and communication disorder specialist. Difficulties seeing test materials or responding to examiner instructions signal the need for specialized vision and hearing evaluation. As some forms of mental retardation are accompanied by physical abnormalities in sensory, motor, and neurological systems, assessment consultation with pediatric specialists should be sought if the child's behavior suggests the presence of heretofore undetected physical problems.

### *Assessment of Maladaptive Behavior*

To this point, we have primarily considered assessment of the mentally retarded child's cognitive deficits, as well as identification of his or her strengths. Assessment in these areas is needed both to describe the child's functioning and to plan appropriate remediation strategies. However, it is important also to evaluate the presence of current *maladaptive* behaviors that will need to be handled by the child's parents or caretakers, or by those professionals who will be working with the child. Severe maladaptive behaviors, if unassessed and untreated, may interfere with the youngster's progress in remedial programs and could prevent the child from effectively functioning in the least restrictive environment that is feasible.

By the term *maladaptive behavior*, we mean behavioral excesses that cause difficulty to those persons who care for the child or that disrupt the youngster's performance in educational, social, or skill-learning situations. Some maladaptive behaviors meriting assessment attention are problems that are seen commonly in most children but that may be more frequent, more severe, or more developmentally persistent among some mentally retarded children. Examples

of these behaviors are tantrums, noncompliance, and aggression. Other maladaptive behaviors occur relatively infrequently among non-developmentally-challenged children but appear to be more common among certain mentally retarded children. These include self-stimulatory and self-injurious activity.

The presence of maladaptive behaviors of these kinds is not a defining characteristic of mental retardation, and developmentally challenged children may exhibit few such problems. However, because the frequency of maladaptive behaviors among mentally retarded children appears to be higher than among children as a whole (American Psychiatric Association, 1980), assessment attention to this area is needed.

### *Assessing General Behavior Problems*

Ordinarily, evaluating the presence and severity of maladaptive child behaviors begins during the interview with the child's parents or with other persons who interact often with the youngster. The adult informant may simply be asked to describe any conduct or behavior problems that are encountered with the child, to indicate the seriousness or frequency of the problem behaviors, and to describe how the maladaptive actions are now handled. However, this form of casual questioning may prove to yield only hit-or-miss information; parents and other adult caretakers often seem to remember behavior problems that occurred very recently before an interview and may not volunteer information about significant or low-frequency problems that are not the subject of specific questioning by the interviewer.

For this reason, it is useful to guide interview assessments of maladaptive behavior with a structured problem checklist. A number of child-behavior problem-checklists have been reported in the clinical and research literature, including the Eyberg Child Behavior Inventory (Eyberg & Ross, 1978), the Quay and Peterson Behavior Problem Checklist (Quay & Peterson, 1975), and the Aberrant Behavior Checklist (Aman, Singh, Stewart, & Field, 1985). The Aberrant Behavior Checklist is normed for the mentally retarded, and the Behavior Problem Checklist was recently normed for adolescents in this population (Matson, Epstein, & Cullinan, 1984). We find the Eyberg scale to be useful because it not only surveys a wide range of common childhood behavior problems but also asks the respondent to indicate how much difficulty is now created by any problems that the child exhibits. For example, learning that a child tantrums provides some assessment information; learning that a child tantrums frequently *and* that these tantrums are exceedingly difficult for the caretaker to handle provides much more complete information relevant to effective intervention planning.

Most behavior problem checklists are written at such a level that they can be completed independently by parents or other caretakers. The interviewer can then review and discuss in more detail with the caretaker those behaviors that have been cited as being a problem. Alternatively, all behaviors on the checklist may be surveyed orally with the caretaker, or with the interviewer marking notations of significant problems. This procedure is necessary with parents unable to independently complete the checklist in a valid manner. Wing and

Gould's Children's Handicaps, Behaviour and Skills (HBS) Structured Interview Schedule (1978) is often useful for gaining specific information about a child's competence. When a child spends portions of his or her day in settings with different people (such as at school and at home), it is prudent to assess whether maladaptive behaviors are observed in each setting. This information provides a more comprehensive measure of the generality versus the situational specificity of any reported problem.

Children with intellectually handicapping conditions often exhibit deficits in their social skills relative to nonretarded peers of the same age. As interventions exist to remediate social skill deficits in mentally retarded children (Geller, Wildman, Kelly, & Laughlin, 1980; Kelly, Furman, Phillips, Hathorn, & Wilson, 1979), assessment is useful to determine whether this aspect of the child's behavior constitutes a problem warranting treatment. The Matson Evaluation of Social Skills with Youngsters (MESSY; Matson, Esveldt-Dawson, & Kazdin, 1983) is an instrument that can be used for initial screening to evaluate the child's social skill repertoire. Other assessment techniques that can be helpful in identifying specific aspects of a child's social functioning problems include direct observation of the youngster's behavior with peers and role-play assessments, supplemented with descriptions of peer relationship skills made by the child's parents, teachers, or other caretakers (see Kelly, 1982, for a detailed discussion of social skill assessment procedures).

### *Self-Stimulatory and Self-Injurious Activity*

As we noted, the mentally retarded child may exhibit maladaptive behaviors different from the conduct problems seen in most children. Self-stimulatory activity (including stereotyped rocking, limb movements, spinning, and other repetitious gesturing) and self-injurious behavior (including self-biting, striking, hair pulling, or head banging) most often occur in children with pervasive developmental handicaps such as autism and severe mental retardation (American Psychiatric Association, 1980). Self-stimulatory behavior may impair a child's progress in educational programs, particularly if the behavior is high-rate and disrupts task performance. Self-injurious behavior may also constitute a risk to the physical well-being of the child.

Assessment of such maladaptive behaviors may be made initially by interviewing the adult caretakers who observe the child. Significant patterns of self-stimulatory or self-injurious behavior are often sufficiently noticeable and so unusual that adults can identify and describe when, where, and how they occur. However, direct observation of the child is also helpful in the assessment of these maladaptive behaviors. This goal can be accomplished by observations conducted in a clinic setting (such as a playroom) or, more ideally, by observing the child in a naturalistic setting where she or he routinely spends time (e.g., in a classroom, in the family's home, or at a developmental center). We discuss observation procedures in more detail shortly.

Although self-stimulatory or self-injurious activity may occur independently of other events in the child's environment, it may also be situation-linked. For

example, a child may be more likely to exhibit this behavior when she or he has become frustrated, during a time of significant environmental change (such as a change in caretaker or teacher), or in conjunction with tantrums. If initial interview inquiry suggests that self-injurious or self-stimulatory behavior is associated with other events, efforts to observe the activity should take place when it is most likely to be exhibited.

When assessing the presence of any maladaptive behavior, it is useful not only to identify the behavior problem, including its severity and frequency, but also to identify relevant antecedents and consequences (Kanfer & Saslow, 1969). Antecedents are those variables that seem to produce or precede exhibition of the problem behavior, and an analysis of consequences entails the identification of outcomes that follow the maladaptive behavior. For example, the examiner, through his or her assessment, may find that tantrums are followed by scolds or threats made by the caretaker (consequences). A functional view of maladaptive behavior should attempt to identify not just the problem activity but also the factors that precede and the consequences that follow the maladaptive behavior. Such an assessment provides more specific treatment-relevant information than does a simple cataloging of problems alone.

### *Behavioral Observation in Home, School, or Other Settings*

In an ideal world, it would be possible for an examiner to observe a child for extended periods of time and across a range of different home, school, and peer interaction situations. If such a protracted, comprehensive observation were possible, the examiner would be able to directly assess many aspects of the child's behavior and to arrive at an exhaustive description of how the youngster handles many situations.

For reasons of time and cost effectiveness, ongoing examiner observations spanning days of time are rarely feasible. However, it often is practical to conduct *in vivo* behavior assessments in other, more cost-effective ways. These methods include (1) observations of the child made in the natural setting at critical periods; (2) observation of the child made during staged *in vivo* situations; and (3) the monitoring of records maintained by a parent, teacher, caretaker, or other adult who is in a position to routinely observe the child's *in vivo* behavior. We will discuss these three assessment strategies shortly. First, however, let us consider the question of determining when and what child behaviors to observe.

### *Selecting Targets for Behavioral Assessment*

It is generally useful to conduct the bulk of a child's evaluation (including standardized testing, parent or caretaker interview, and caretaker interview assessment of maladaptive behavior) before making any decision concerning behavioral or observational assessment. By doing so, the examiner gains information about skill deficits or problems requiring more detailed behavioral observation. For example, a teacher may report to the examiner concerns about the child's inadequate peer relationships, or a parent may indicate that the child

tantrums frequently after school. Such interview-based reports suggest times at which or situations in which behavioral observation will be most useful (e.g., during a free-play time at school when social skill problems are likely to occur or at home in the afternoon when tantrums are reported to take place).

Because any observational assessment in the natural environment entails an expenditure of time and effort, attempts should be made to observe the child at times and in settings where significant behavior can readily be seen. Although we believe that the evaluation of any mentally retarded child is made more comprehensive by the inclusion of observational data, this source of assessment information is most important when the examiner is evaluating a child with significant behavior problems, skill deficits, or difficulties (such as peer social problems) that cannot be adequately observed in the standard individual-assessment session.

### *Observation in Vivo at Critical Times*

One behavioral assessment strategy is for the examiner to personally observe the child in those settings, focused at those times, when the behaviors of interest are apt to occur naturally. Classroom observation can provide information on the child's task attentiveness, interactions with peers, and other behaviors; it can also provide background data on how the child's behavior, including any problem behavior, is handled by classroom teachers. Observation in the home, especially during periods when problems are reported to occur, provides similar information about the child's behavior and skill level, as well as about how the child is dealt with by home caretakers.

Observational assessment may be casual and descriptive or it may be quantified and specific, depending on the examiner's objectives. In a descriptive assessment observation, the examiner notes problem behaviors, their apparent environmental antecedents, and their natural consequences in the setting. Because assessment focuses not only on problems and deficits but also on strengths, the examiner should also note adaptive competencies exhibited by the child.

There are also various methods for conducting rigorous, quantified observations of child behavior in school or at home. Coding systems exist for systematically recording the frequency of a child behavior as well as its antecedents and consequences, for recording patterns of social interaction among children in free-play situations, and for recording interaction patterns between the child and his or her adult caretakers. Several of these systems are described in Chapter 7. A detailed consideration of quantified observation methodologies is beyond the scope of this chapter, but the reader may wish to consult a specialized resource on these procedures (cf. Gelfand & Hartman, 1975; Mash & Terdal, 1976). Formal interaction coding is not generally included in routine evaluations of mentally retarded children, but under special circumstances, it may prove useful.

There are no hard guidelines concerning the length of time an examiner should observe a child in the *in vivo* setting, nor for the number of setting visits that should be made. Such decisions involve what behavior is being observed,



how frequently it occurs, how difficult it is for the examiner to conceptualize the problem behavior and, of course, whatever constraints there are on the examiner's time. However, several mechanisms exist for conducting behavioral assessments in a more time-efficient manner than observing and "just waiting" for the child to do something.

### *Observing Child Behavior during Staged Situations*

During a teacher interview, the examiner may be told that a child has "difficulties interacting with classmates," and the examiner may wish to directly observe the child to see how he or she behaves with peers. One strategy here is to visit the classroom, to observe, and to hope to see a peer interaction involving the child. However, a more time-efficient and informative strategy would involve staging a classroom situation that allows the behavior to occur predictably. In this case, the teacher (in cooperation with the examiner) may plan to have students work together on a class project when the examiner visits. In that way, a planned or staged event is created that allows the observer the best possible opportunity to see how the child behaves.

The same approach can be used in the home to observe parent-child interactions. Families in our clinic at the University of Mississippi Medical Center are sometimes observed while engaging in planned, structured interaction activities in their homes. For example, to observe a child's noncompliance and a parent's method of handling it, we ask the parent to have the child engage in some task likely to elicit refusal (such as picking up small objects scattered over the floor). As the child tires of the task and becomes noncompliant, we are able to directly observe what the child does and what the parent's skill level is for handling noncompliance (see Kelly, 1983).

### *Behavior Monitoring*

Finally, it is possible to obtain data on the child's behavior by enlisting the help of a responsible party in the environment to monitor and log instances of the behavior of interest. Parents, teachers, or residential program staff who spend a good deal of time with the youngster can record specified behavior problems, self-stimulatory or injurious activity, exhibition of skill behaviors, or other clearly identifiable actions. Just as an interview-based review of behavior problems is most useful when it includes a specification of antecedents and consequences, monitored records are most informative when the observer notes what preceded and followed the recorded behavior.

## INTEGRATING ASSESSMENT FINDINGS

At the conclusion of an evaluation, the examiner has findings of several kinds and from a variety of sources. As we have seen, these may include interview-based findings from caretakers, teachers, and others; performance results

on standardized tests of intellectual ability, achievement, and adaptive behavior; reported descriptions of maladaptive behavior, augmented by completed scales of behavior problems; behavioral observations of the child made by the examiner during testing; and behavioral observations made *in vivo*. The task of identifying a child's intellectual, achievement, and adaptive behavior scores from standardized tests is important for classification purposes and is relatively straightforward except in cases where the validity and accuracy of the findings are in question. Perhaps the more interesting and challenging component of assessment is identifying the child's specific strengths and limitations, and defining areas for intervention so that the developmentally challenged child can best reach his or her highest level of functioning.

Some information on strengths and limitations can be obtained from standardized test scores. Patterns of subtest performance on intellectual ability measures, achievement test scores in specific academic areas, and adaptive behavior levels in various skill areas can be used to identify what the child does best, what areas are deficient, and where educational efforts should be especially focused. However, other results can—and should—also be integrated into the final assessment. These include information about the nature and severity of behavior problems or maladaptive behavior based on interviews, scales, or observational measures; recommendations concerning how any problems may be handled at home, at school, or in other settings; an assessment of the child's skills in social interactions, school tasks, self-help, and other areas; and recommendations for further specialized evaluations and intervention consultation that may be needed. In this way, assessment of the mentally retarded child moves beyond simply describing the youngster's level of intellectual deficit and forms part of the initial framework for practical intervention and educational planning.

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# 21 *Learning Disabilities*

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## INTRODUCTION

The area of learning disabilities has grown from being the newest entry into the field of special education to being the highest service-delivery area. Currently, one-fourth of those public school students identified as handicapped are classified as learning-disabled (McKinney & Feagans, 1983). Unfortunately, this expansion has been accompanied by considerable controversy regarding both the definition of a learning disability and the procedure used for its diagnosis and assessment. The purpose of this chapter is twofold. The first purpose is to present and critically review prominent definitions of a learning disability. The second is to discuss and evaluate formal and informal procedures for diagnosing learning-disabled students. The overall goal of the chapter is to suggest a diagnostic and assessment regimen that will enhance services to learning-disabled persons in educational and clinical settings.

## DEFINITIONS OF A LEARNING DISABILITY

Before 1960, a variety of terms were used to describe children whose learning and behavioral characteristics defied categorization into traditional areas of exceptionality. Cruickshank (1972) identified over 40 such labels, including *brain-injured*, *minimal brain dysfunction*, and *perceptual handicap*. The term *learning disability* was unveiled by Kirk and Bateman (1962). It was defined as

A retardation, disorder, or delayed development in one or more of the processes of speech, language, reading, writing, arithmetic, or other school subjects resulting from a psychological handicap caused by a possible cerebral dysfunction and/or emotional or behavioral disturbance. It is not the result of mental retardation, sensory deprivation, or cultural or instructional factors. (p. 73)

The following year, Kirk used the term in a speech delivered at a conference sponsored by the Fund for Perceptually Handicapped Children, Inc., where it was readily accepted by professionals because of its emphasis on educational

implications rather than medical aspects (Smith, 1983). Bateman (1965) further clarified the definition by including as learning disabled those children

who manifest an educationally significant discrepancy between their estimated intellectual potential and actual level of performance related to basic disorders in the learning process, which may or may not be accompanied by demonstrable central nervous system dysfunction, and which are not secondary to generalized mental retardation, educational or cultural deprivation, severe emotional disturbance, or sensory loss. (p. 220)

As the popularity of the term *learning disability* increased, so did the demand for public funding of instructional programs designed to meet the unique needs of these students. To facilitate the allocation of funds, the U.S. Office of Education (1968) created the National Advisory Committee on Handicapped Children (NACHC). This committee formulated a definition of learning disabilities that stated:

Children with special learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or in using spoken or written languages. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling, or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental aphasia, etc. They do not include learning problems which are due primarily to visual, hearing, or motor handicaps, to mental retardation, emotional disturbance or to environmental disadvantage. (p. 34)

Although the NACHC definition has been instrumental in securing funds, developing appropriate programs, and establishing laws governing support of handicapped children, it has been criticized for a number of reasons:

1. The definition is too general and ambiguous (Hammill, 1974).
2. It does not specify the severity of the disability that qualifies an individual for services (McIntosh & Dunn, 1973).
3. Bateman's (1965) discrepancy clause is omitted.
4. The phrase "basic psychological process" is ambiguous (Mercer, 1979).
5. The definition relies on exclusion to define its target population. Children are considered learning-disabled on the basis of what they are *not*, that is, mentally retarded or sensorily impaired (Smith, 1983).
6. The exclusionary clause has been interpreted to mean that children demonstrating other handicapping conditions, such as mental retardation or a hearing impairment, may not be considered learning-disabled, a point with which many authors have taken issue (Myers & Hamill, 1982; Sabatino, 1983).

In light of these issues, there have been several attempts to refine the definition formulated by the NACHC. The National Project on the Classification of Exceptional Children (Wepman, Cruickshank, Deutsch, Morency, & Strother, 1975) defined *specific learning disability* as referring to

those children of any age who demonstrate a substantial deficiency in a particular aspect of academic achievement because of perceptual or perceptual-motor handicaps, regardless of etiology or other contributing factors. The term *perceptual* as used here

relates to those mental (neurological) processes through which the child acquires basic alphabets of sound and forms. (p. 306)

By restricting the term to those children who evidence learning difficulties resulting from perceptual or perceptual-motor handicaps, Wepman and his associates sought to reduce the ambiguity associated with earlier definitions of a learning disability (Smith, 1983). Unfortunately, others maintained that the focus on perceptual handicaps would be too restricting (Adelman & Taylor, 1983). In addition, the definition was criticized for linking a learning disability to a perceptual cause in the absence of empirical support (Hallahan & Kauffman, 1976).

The Bureau of Education for the Handicapped attempted to compensate for the lack of a discrepancy clause and to specify the severity of disability that warranted intervention (*Federal Register*, 1976). Its definition stated:

A specific learning disability may be found if a child has a severe discrepancy between achievement and intellectual ability in one or more of several areas: oral expression, written expression, listening comprehension or reading comprehension, basic reading skills, mathematics reasoning, or spelling. A *severe discrepancy* is defined to exist when achievement in one or more of the areas falls at or below 50% of the child's expected achievement level, when age and previous educational experiences are taken into consideration. (p. 52405)

The definition also included a formula for determining the severe discrepancy level where CA is the chronological age:

$$\text{Severe Discrepancy Level} = \text{CA} \left( \frac{\text{IQ}}{300} + 0.17 \right) - 2.5$$

Reaction to this definition was largely negative. Specifically, it was criticized on the grounds that (1) the mathematical formula was unsound; (2) students identified by means of these guidelines would differ from those already being served in existing programs; and (3) it ignored states' rights to establish criteria using local norms and clinical judgments (Norman & Zigmond, 1980). Based on these criticisms, the discrepancy formula was eliminated from the definition.

Public Law 94-142, the Education for All Handicapped Children Act, defines a learning disability in a manner similar to that proposed by the NACHC (*Federal Register*, 1977):

*Specific learning disability* means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage. (p. 65083)

In addition, the law established criteria for the identification of learning-disabled children (*Federal Register*, 1977):

- (a) A team may determine that a child has a specific learning disability if
  - (1) The child does not achieve commensurate with his or her age and ability levels

- in one or more of the areas listed in paragraph (a) (2) of this section, when provided with learning experiences appropriate for the child's age and ability levels; and
- (2) The team finds that a child has a severe discrepancy between achievement and intellectual ability in one or more of the following areas:
    - (i) Oral expression;
    - (ii) Listening comprehension;
    - (iii) Written expression;
    - (iv) Basic reading skill;
    - (v) Reading comprehension;
    - (vi) Mathematics calculation; or
    - (vii) Mathematics reasoning.
  - (b) The team may not identify a child as having a specific learning disability if the severe discrepancy between ability and achievement is primarily the result of
    - (1) A visual, hearing, or motor handicap;
    - (2) Mental retardation;
    - (3) Emotional disturbance; or
    - (4) Environmental, cultural, or economic disadvantage (p. 65083)

The definition included in PL 94-142 has emerged as the most widely accepted definition of a learning disability. Therefore, the professional is well advised to become thoroughly acquainted with this definition and with the advantage and disadvantages associated with its use.

This definition offers the professional three major advantages. First, there is an emphasis on the identification of a learning-disabled student that is based on matters of educational significance rather than on medical causes. Although medical records should be reviewed, the professional's attention must be focused on factors that are more relevant to an educational setting, such as underachievement. Given this orientation, the professional is better able to select appropriate assessment instruments. Second, the PL 94-142 definition emphasizes a discrepancy between an individual's potential and his or her actual achievement as the primary determinant of a learning disability. Again, the professional receives guidance in selecting instruments for inclusion in an assessment battery. These tests must reflect measures of a student's potential and actual achievement. Finally, this definition has eliminated the controversial discrepancy formula included in the earlier *Federal Register* (1976) definition. Thus, individual states are allowed to establish criteria for the degree of discrepancy between potential and actual achievement, based on local norms or clinical judgments.

The PL 94-142 definition has two major disadvantages. First, the definition contains an exclusionary clause that unfortunately has been widely interpreted as meaning that individuals who have less than average intelligence or who evidence emotional, sensory, or environmental deficits cannot be considered learning-disabled. Closer inspection of this clause leads to the interpretation that a learning disability cannot be the direct result of these other handicaps; it can, however, coexist with these conditions. The professional must be aware of this possibility and must not rule out the existence of a learning disability should the child evidence other handicaps during the course of assessment. Second, permitting individual states to establish their own criteria for the degree of discrep-

ancy has resulted in a wide variety of standards. The professional must realize that these criteria vary across states and that they influence the number of learning-disabled individuals who are identified and served.

One dimension that cuts across the advantages and disadvantages associated with the PL 94-142 definition of a learning disability is related to discrepancy. A discrepancy between an individual's actual and potential achievement is a major characteristic of this definition, yet the professional is left without a way to determine how severe the discrepancy should be. The next section of this chapter addresses the issue of discrepancy and provides the professional with the most common methods of measuring its severity.

## THE DISCREPANCY FORMULA

The primary characteristic of an individual with a learning disability is a discrepancy between his or her levels of potential and actual achievement. This discrepancy can occur in any of the following areas: (1) oral expression; (2) listening comprehension; (3) written expression; (4) basic reading skills; (5) reading comprehension; (6) mathematics calculation; or (7) mathematics reasoning. In addition, an uneven pattern of development may be noted within a subject area, as in the case of a student who excels in reading comprehension yet performs poorly on tasks that require word analysis.

Although the PL 94-142 definition emphasizes a discrepancy as a key factor in the diagnosis of learning disability, it does not include a formula by which the severity of this discrepancy may be calculated. Thus, the states may establish their own standards regarding the severity of a discrepancy that warrants intervention. Currently, there is little uniformity among states regarding specific discrepancy levels, although two methods for determining these levels have emerged: setting grade-level cutoffs and setting a percentage or standard discrepancy score. Each of these methods is discussed separately.

### *Grade-Level Cutoffs*

This method compares grade placement with how far below grade level a student is functioning in a particular area. Usually, students in Grades 1–3 qualify for services if they are one year behind. Students in Grades 4 and up are eligible if they are two years behind (Smith, 1983). Other authors have suggested that high school students should receive services only if they are achieving below the third-grade level (Wiederholt, 1975), the mid-fourth-grade level (Hammill, 1976); or the sixth-grade level (Goodman & Mann, 1976).

Smith (1983) presented some of the disadvantages of using grade-level cutoffs as a measure of discrepancy. First, the method ignores a student's potential for achievement. A bright student who demonstrates grade-level reading skills would not be identified as learning-disabled, even though measures of cognitive abilities indicate that the student should be reading above grade level. Second,



the use of a grade equivalent may be a questionable procedure, as tests typically sample only a few items at each level, and errors can be high. Third, implications of underachievement vary with the subject area. A four-year delay in reading may be judged more serious than a comparable lag in mathematics.

In light of the disadvantages associated with the use of grade-level cutoffs, the professional is advised to become acquainted with the second method of determining the severity of a discrepancy. This method involves the use of a percentage or a standard degree of deviation.

### *Percentage or Standard Discrepancy Scores*

With the use of this procedure, to qualify for services a student's level of performance must lag behind his or her level of expectation by a specific percentage or standard deviation. A number of formulas have been devised for calculating a student's discrepancy score, each of them involving various combinations of measures of achievement age (AA), intelligence (IQ), chronological age (CA), years in school (YIS), and grade age (GA). All of these formulas, however, do have one common objective: to identify intraindividual, or within-the-child, differences.

Monroe (1932) combined mental age, chronological age, and arithmetic computation age (ACA) to estimate a child's expected level of reading performance (RE):

$$RE = \frac{MA + CA + ACA}{3}$$

She recommended that a student be considered disabled in reading if he or she achieved less than 80% of what was expected from this formula.

Harris (1961) calculated reading expectancy grade level by using a student's mental age:

$$RE = MA - 5$$

A comparison between the student's reading expectancy and his or her present reading level determined the existence of a discrepancy.

Bond and Tinker (1967) calculated reading grade expectancy by combining measures of intelligence and years in school:

$$RE = \frac{(YIS)(IQ)}{100} + 1.0$$

This formula assumed that the child who has spent more years in school has acquired more knowledge than another child who has had fewer years of education.

Myklebust (1968) used measures of mental age, chronological age, and grade age to calculate expected age (EA):

$$EA = \frac{MA + CA + GA}{3}$$

Achievement age was divided by the expected age and a learning quotient was obtained:

$$LQ = \frac{AA}{EA}$$

A score of 89 or below classified a child as learning-disabled.

Harris (1970) calculated expectancy age by combining measures of mental age and chronological age:

$$EA = \frac{2 MA + CA}{3}$$

The use of discrepancy formulas is not without disadvantages. First, expectancy levels for a particular student may vary, depending on the formula used. Thus, the same student may be diagnosed as learning-disabled by one formula and as functioning at normal levels by another. Second, the same formula may not be used with equal confidence across different grade levels, sexes, ethnic groups, and tests (Macy, Baker, & Kosinski, 1979). Third, IQ scores are frequently included in calculations, yet it is difficult to establish a student's learning potential because different intelligence tests produce different outcomes. Fourth, the measurement error present in standardized achievement tests limits the confidence with which scores can be interpreted and further limits the usefulness of discrepancy scores (Mercer, 1979). Fifth, Smith (1983) noted that the severity of a discrepancy is a function of age and grade level. An 8-year-old third-grader demonstrating a one-year delay in reading may be more in need of learning disability services than a 17-year-old junior in high school evidencing a similar deficit.

In spite of these limitations, the use of discrepancy formulas does offer distinct advantages to the professional. First, learning-disabled students are identified through the use of objective measures. Second, discrepancy formulas provide a uniform means of selecting participants for empirical investigations, thus facilitating the interpretation and comparison of results. Third, the professional can use these formulas with students who are either gifted or retarded because they place no restrictions on the student's intelligence level (Smith, 1983).

In summary, the preceding section has identified the discrepancy between a student's expected and actual performance as the key determinant of a learning disability. Two major approaches for determining the severity of this discrepancy were presented, as were the advantages and disadvantages associated with the use of each. The professional should regard these formulas as providing general diagnostic guidelines, recognizing that clinical judgments based on additional data may influence the resulting diagnosis.

In order to establish grade cutoff levels or to calculate discrepancy levels by using a formula, the professional must have data regarding a student's current status. These data may be obtained through the use of formal and informal instruments. Formal techniques include commercially produced, norm-referenced tests. Informal measures include criterion-referenced tests, interviews, and behavioral observations. These instruments are described in the following sections.

## FORMAL ASSESSMENT

*Formal assessment* refers to the use of norm-referenced tests that report inter-individual differences, or differences between one person and a group of persons. Scores on a standardized achievement test, for example, compare a student's performance to that of a normative sample. Norm-referenced tests serve two major functions in educational and clinical programs for learning-disabled persons. First, they are typically used for diagnostic and placement purposes. Unlike the criterion-referenced tests that are discussed later, norm-referenced tests produce a measure of student performance that is interpretable to professionals across geographic areas and disciplines, and over periods of time. Intelligence tests, aptitude tests, college boards, and certain achievement tests, for example, produce scores that have universal meaning to people in education-related professions. Data derived from these tests, when combined with other information, may be used to make decisions about the student's potential in a given curriculum or program. Similarly, as one of several sources of data, achievement test and intelligence test scores may assist the multidisciplinary team in identifying an appropriate educational placement. This is of importance because the majority of special-education labels and subsequent placements are tied by law to norm-referenced measures.

The second major function of norm-referenced tests is to provide a summative evaluation of the student's long-term performance. The standardization procedure used with these measures allows the professional to administer the test annually and to produce directly comparable data. When matched to the classroom curriculum, these data can be used as a general measure of the efficacy of the instructional program.

### *Limitations of Norm-Referenced Tests*

Unfortunately, several major problems limit the usefulness of norm-referenced tests. First, norm-referenced tests provide more information on how an individual's abilities compare with those of others than on how they compare with community standards. Consequently, a student's performance may be judged by the test norms as being deficient, whereas his or her skills are well within the level required for success in a chosen profession.

A second limitation of norm-referenced tests is that special-needs students are often underrepresented or unrepresented in the norm group. For example, the authors of the Illinois Test of Psycholinguistic Abilities, a norm-referenced test frequently used to diagnose learning disabilities, did not include learning-disabled or other handicapped persons in the standardization sample (Salvia & Ysseldyke, 1978). As a result, valid comparisons may not be made between the learners' performance and the test norms.

A third limitation is that norm-referenced tests may discriminate against minority students (Anastasi, 1976). The language, experiential, and competitive aspects of these tests place children and youth from minority cultures at a decided disadvantage. At the very best, their scores may predict how they will

perform in the dominant culture (Sattler, 1974). Unfortunately, the scores will do little to project the learner's potential for success in his or her home community.

The fourth limitation involves the frequency and ease of administration. The majority of commercially available norm-referenced measures require a substantial amount of time to be administered. In addition, many standardized tests require specialized training on the part of the psychometrician. Finally, these tests may not be administered with sufficient frequency to be sensitive to performance changes occurring during instruction. Annual or semiannual administrations limit the teacher to making instructional decisions *after the fact*. By the time standardized-achievement-test data are obtained, a good portion of the school year has elapsed.

Finally, many norm-referenced tests have limited diagnostic potential from a skill-training perspective. Efforts to use norm-referenced tests to establish modality preferences that enhance learning have not proved successful (Sedlak & Weener, 1973; Tarver & Dawson, 1980; Ysseldyke, 1973). Additionally, the standardization procedure, or the protocol that the examiner must follow to ensure that the conditions of the student's performance will be comparable to that of the norm group, seldom allows the professional to test instructional hypotheses.

### *Evaluating Norm-Referenced Tests*

A wide variety of tests are available for use with learning-disabled persons. These measures differ across a number of dimensions that influence their usefulness. Consequently, these variables must be taken into consideration when evaluating norm-referenced tests for the purpose of possible adoption. The American Psychological Association (1974) has prepared *Standards for Educational and Psychological Tests*, which may provide assistance in selecting an appropriate test. In addition, tests are reviewed in Burros' *Mental Measurement Yearbook* (1978) and Mitchell's (1983) *Tests in Print III*. Beyond these sources, answers to the following set of questions should be used as decision-making guidelines when evaluating norm-referenced tests:

1. Will information from the test yield answers to my assessment questions? What is the author's stated purpose and basis for selecting items?
2. Are the norms appropriate? To what extent is the normative group representative, in characteristics (age, sex, grade level, ethnicity, socioeconomic status, and geographic region), of my particular population? When were the norms established? Were members of the normative group selected by random stratification? Is the number of cases in the normative group large enough to ensure stability of the test scores?
3. Is the test reliable and valid? Is there empirical evidence of what the test measures?
4. What skills are necessary for taking the test? Do they match the skills of my students? Does the mode of communication match that of my students? Is the test nondiscriminatory in terms of race, culture, sex, and handicap?
5. Does the test represent the most efficient method for gathering the infor-

mation? What about the effort and time required to administer, score, and interpret the test? Do my skills match the specialized training necessary to scrupulously follow the standardized procedures? Is the test cost-effective?

### *Commonly Used Norm-Referenced Tests*

The appendix to this chapter contains a partial listing of available norm-referenced tests that are frequently used in assessing learning-disabled individuals. The headings used correspond to possible discrepancy areas between achievement and intellectual ability as outlined in PL 94-142. We do not attempt to evaluate the adequacy of these instruments here, as this has been done elsewhere (Salvia & Ysseldyke, 1987).

## INFORMAL ASSESSMENT

*Informal assessment* refers to the use of nonstandardized techniques to gather information regarding a child's current educational status. Typically, informal assessment involves the use of criterion-referenced tests, interviews, and behavioral observations (or continuous measurement). Each of these techniques is discussed in the following sections.

### *Criterion-Referenced Tests*

Criterion-referenced tests are designed to evaluate intraindividual, or within-the-student, differences. Rather than reporting a student's standing in the standardization group, a criterion-referenced test reports the learner's standing against the instructional objective. For this reason, criterion-referenced tests are best suited to formative and diagnostic evaluation purposes. *Formative evaluation* is the assessment of learner performance during instruction to ensure steady progress toward the instructional objective. Criterion-referenced measures used for this purpose can be administered at regular intervals. These frequent assessments allow the professional to identify the extent to which the objectives of preceding lessons have been met. In addition, formative evaluation data may be used to gauge the rate at which new information should be introduced.

*Diagnostic evaluation* involves the use of criterion-referenced tests to uncover learning difficulties and to identify effective educational programs. At a gross level, diagnostic evaluation occurs when a criterion-referenced test demonstrates that the student has not mastered the target skill. This information suggests that either the objectives or the instructional procedures are not appropriate. A more refined level of analysis may be the identification of specific deficiencies in the learner's performance. Beyond simply noting that a skill was not acquired, this level encourages the identification of specific error patterns that have instructional implications. The most precise level is to identify the relative effectiveness of various instructional procedures. Criterion-referenced tests

data, used wisely, can assist the professional in matching the most efficient and effective instructional procedures to the learner's characteristics.

Criterion-referenced tests can be less expensive and less time-consuming to administer and score than more formal assessment measures. Because they do not require specialized training to administer, these tests may be given by the professional who is in the best position to observe the students on a daily basis. Finally, many of the graded curriculum materials used by school districts can be easily modified to include criterion-referenced measures. The major value is that, rather than determining how a student compares with a general standard or norm, the professional is able to gauge the student's progress against the specific instructional aims.

### *Limitations of Criterion-Referenced Tests*

Ebel (1975) described a number of special problems created by criterion-referenced tests. He contended that there is a problem of arbitrariness on the part of teachers, who must initially select, and subsequently defend, a set of skills that each learner is expected to master. In addition, some professionals may lack experience in task-analyzing skills for purposes of instruction. There is a problem in rationally defining a particular level of test performance that will clearly evidence the attainment of each objective. Criterion-referenced tests also necessitate the creation of multiple parallel test forms for repeated testing of learners who do not reach the criterion during initial testing. Finally, writing and using lengthy reports that describe objectives that have and have not been achieved can be a very cumbersome process.

Another potential problem associated with criterion-referenced tests is that each test samples only a limited number of objectives. A danger exists that the student may be induced into rote learning rather than developing higher level conceptual abilities. Professionals run the risk of structuring curriculum objectives around easily measured skills as opposed to more difficultly evaluated higher order processes.

Criterion-referenced testing technology is still in its infancy and therefore is also hampered by poorly developed commercial tests. Hambleton and Eignor (1978) evaluated 11 widely used commercially developed criterion-referenced tests and found problems with test score reliability, validity of scores, item analysis, and cutoff scores. They concluded that there is substantial room for improvement in the available criterion-referenced tests.

### *Criterion-Referenced Test Development*

Seven basic steps are involved in the preparation of a criterion-referenced measurement system (Schloss & Sedlak, 1986). Each is discussed separately.

*Identifying Objectives.* The foundation on which criterion-referenced tests are built is the learner's set of educational objectives. Behavioral objectives include four major components: (1) the student's name; (2) the target response; (3)

the conditions under which the response is to occur; and (4) the performance criteria. The well-designed criterion-referenced test is a natural extension of the objective. From a test construction standpoint, the target-response and the condition-of-performance components dictate the stimulus-and-response dimensions of the test.

*Enumerating Subskills.* Data indicating a student's performance on a typical objective are generally too broad to produce useful formative or diagnostic information. A criterion-referenced test that measures the performance of the objective may not be sensitive to the intermediate skills acquired in each instructional period. To overcome this limitation, assessment procedures are often linked to the task sequences or subskills of the objective.

Subskills further delimit the scope of the test. Once the subskills are stated, there should be the little question of precisely what the test is intended to measure. Further, the enumeration of subskills provides a clear reference point for the construction of particular test items.

*Establishing Test Specifications.* Test specifications include three general components. First is *the objective and the subskills being measured*. This statement communicates the scope of the test so that the professional has a clear understanding of precisely what is being assessed. Knowledge of the objective and the subskills allows the educator to place an instructional value on the student's score. Second, *the stimulus features* represent the procedures and materials used in the test to elicit a student's response. Stimulus attributes should include all of the critical dimensions that indicate how assessment items were designed and presented (Popham, 1978). In other words, the same stimuli should be available to the learner during the test as are included in the condition statement of the objective. Finally, *the response features* represent the format through which the learner is expected to respond to the stimulus features. Like the stimulus features, the response features should be consistent with the target response statement of the objective. The same response features described in the objective should be produced in the criterion-referenced test.

*Developing Items.* Test item construction and scoring procedures are important to enhancing the reliability of the test. Reliable tests can be characterized by six major features. First, the scope of the test should be limited so that the learner's performance is easily interpreted. Second, the test should include from 5 to 20 items designed to measure each subskill. Third, the instructions for completing the test should be clear and complete. Fourth, the information provided in the question should be unambiguous. Fifth, the vocabulary and syntax of the question should be well within the student's ability. Finally, embedded clues that provide sufficient information for even an unknowledgeable person to do well should be avoided.

Criterion-referenced tests include binary-choice, multiple-choice, matching, short-answer, and essay items. The reader should refer to Popham (1978) for a complete discussion of proposed guidelines and of the advantages and disadvantages inherent in these types of items.

*Establishing Recording and Scoring Procedures.* One of the major purposes of

criterion-referenced measurement is to provide detailed information about the students' performance. Consequently, obtaining the percentage of correct data alone fails to make use of the full potential of the test. Error analysis, a very useful procedure for obtaining diagnostic information from a criterion-referenced test, was described by Sedlak, Steppe-Jones, and Sedlak (1982). Error analysis involves the study of incorrect responses for the purpose of identifying common elements. These elements are then hypothesized to be specific skill deficiencies that may become the focus of future instruction.

The initial planning of a criterion-referenced test can substantially reduce the amount of time spent on conducting error analysis. As was discussed previously, the test specifications identify the subskills measured by the test. Also, from 5 to 20 test items developed for the test are matched directly to these subskills. By design, the majority of instructional deficiencies may be noted within one or more of these subskills. Error analysis can therefore be conducted by obtaining component scores that reflect performance on the individual subskills. When a subskill score is below criterion, the professional may study the subskill items to obtain further clues that will assist in subsequent instruction.

*Determining the Test's Reliability.* Three major procedures are commonly used to evaluate the reliability of an instrument. The first, *test-retest reliability*, reports the stability of the instrument. Test-retest reliability is a measure of the consistency of an obtained score over a period of time. The second reliability measure, *alternate-forms reliability*, involves providing two equivalent forms of the same test to a group of students. The scores on the two tests are then correlated to produce a reliability coefficient. The final reliability measure, *internal-consistency reliability*, involves forming alternate forms of items within the test. Because internal-consistency-reliability estimates are much more easily obtained than the preceding reliability coefficients, it may be the reliability measure of choice in applied settings.

Correlational procedures used in establishing the reliability of criterion-referenced tests have been adapted from techniques used with norm-referenced tests. Because criterion-referenced tests seek to demonstrate that all students have mastered the subskills comprising an objective, variability between students is inconsequential, and homogeneous data may be obtained, producing more conservative estimates. Although statisticians have proposed methods to resolve this problem, an acceptable solution has not been found (Gronlund, 1976). Therefore, the professional may apply traditional correlational-measures-viewing data obtained on homogeneous data pools with considerable caution.

*Determining the Test's Validity.* Test developers frequently describe three measures of validity. *Content validity*, the most important measure of validity used with criterion-referenced tests, is judged by determining that the items in the test reflect the domains being measured. *Concurrent validity* refers to the extent to which performance on the criterion-referenced test corresponds to other measures. *Predictive validity* involves a correspondence between the test and some future variable. Not only should a criterion-referenced test reflect the student's skill level in current functional environments, but it should predict



how the learner will do in future environments. Content, concurrent, and predictive validity are closely related. To be useful, any test must exhibit, to some extent, all three forms of validity.

A final validity measure, appropriate specifically to criterion-referenced tests, is *sensitivity to instruction*. One of the major justifications for using criterion-referenced tests is to demonstrate the effectiveness of instruction. Therefore, one measure of the validity of a criterion-referenced test is its ability to detect performance changes resulting from the educational program. The most sensitive test will produce a 100% change in scored performance, whereas the least sensitive test will provide no change in scored performance.

### *Evaluating Criterion-Referenced Tests*

Popham (1978) proposed six criteria that professionals may apply when selecting commercial instruments. Although the reader may use these criteria for the stated purpose, they are also useful for evaluating teacher-made instruments:

1. Does the instrument have a clear descriptive scheme? Can the objective and subskills that the instrument is designed to assess be identified? Are the results easily interpreted with reference to the objective and subskills?
2. Does the instrument contain enough items to provide a reasonable sample of each subskill? Is there a close relationship between the items' characteristics and subskills?
3. Is the focus of the test limited to, at most, one objective and/or several subskills?
4. Does the test provide reliable data? Do test-retest, alternate forms, and/or split-half reliability estimates support the prevision of the measure? Can estimates be made of the amount of measurement error likely in each score?
5. Does the test produce valid findings? Do the test items reflect the objective and subskills being measured? Are the item dimensions consistent with the condition and target-skill statements of the objective? Does performance on the test concur with performance on other measures? Does it predict how the learner will perform in similar future endeavors? Is it sensitive to instruction?
6. Has the test been demonstrated to be useful in applied situations?

### *Interviews*

An interview is a structured interaction between the professional and the targeted individual or significant others (Haynes & Wilson, 1979). It may be loosely structured, as in an informal conversation, or highly structured through the use of oral or written inventories of items pertaining to the student's medical, psychological, educational, and socioeconomic background (Adelman & Taylor, 1983). Typically, an interview is included in assessment batteries used with learning-disabled students in order to (1) clarify referral reasons; (2) determine initial assessment procedures; (3) obtain information regarding the student's background; (4) discover areas of strengths and weaknesses; (5) confirm,

reject, or supplement the conclusions of the formal evaluation; and (6) obtain the student's cooperation.

Berler and Romanczyk (1980) surveyed seven journals from the years 1972 to 1978 in order to determine the assessment procedures selected to identify learning-disabled students. They reported that interviews comprised only 1% of the nonstandardized instruments used during assessment; all of the interviews had been conducted with parents. A review of the literature published since 1980 has uncovered other studies that have incorporated interviews into the assessment process. These interviews have included not only parents, but teachers and the students themselves, each of whom offers different types of valuable information and insights regarding the nature of the problem.

### *Parents*

The professional must view parents as an important source of information concerning the student. Typically, data collected during a parental interview focus primarily on the child's development and background. Parents are requested to provide information pertaining to prenatal history, birth conditions, and neonatal development. They can specify when their child attained developmental milestones such as sitting, crawling, walking, talking, and toilet training. Parents can describe their child's health history, including childhood diseases and any serious illnesses or injuries; of particular interest are those that required hospitalization before the age of 3.

In addition, the professional may use a parental interview to obtain information other than that related to medical background and developmental milestones. For example, parents may be questioned about any previous testing and treatment that may have been conducted with their child. Parents may also describe any learning problems experienced by other members of the family. It is further recommended that parents provide information regarding the stability of their child's instruction, such as a mid-year teacher change or a description of any long absences from school, especially during the first three grades (White, 1983). Finally, the professional should offer the parents an opportunity to disclose any other information that they believe may be relevant but that may have been neglected during the course of the interview.

### *Teachers*

Interviews are also conducted with school personnel and focus on the student's educational history. According to Chalfant and King (1976), a teacher can provide information regarding a number of facets of the student's behavior. First, a teacher can describe the student's attending behavior. For example, a teacher can answer questions regarding the student's ability to focus attention on relevant stimuli, to shift attention from one stimulus to another, and to attend to specific kinds of tasks and not to others. Second, a teacher can describe the student's discrimination skills by providing information regarding his or her ability to match shapes, to copy, and to work puzzles. Third, a teacher can

comment on the student's memory functions, including the nature and quantity of the information retained, the need for repetition, and the tendency to forget previously learned material when presented with new material. The professional should also ask the teacher to comment on the student's social behavior. For example, a teacher may be asked to identify how many friends a student has and to describe how he or she interacts with peers.

### *Students*

An assessment of a student with a suspected learning disability may include an interview with the actual student. Two areas of concern that may be addressed during an interview are interests and student attitudes. Interests may include clubs or hobbies. Attitudes toward school, teachers, and friends may be included. In addition, the professional may ask a student to discuss various aspects of his or her problem, such as what he or she thinks the problem is, why he or she has it, and what can be done about it. Finally, the professional may provide a student with the opportunity to discuss his or her perception of the status of his or her family, such as current family events, living arrangements, and any impending changes.

### *Interviewer Behavior*

Research on interviewing children and their families has failed to provide a set of rules governing interviewer behavior (Haynes & Wilson, 1979). Some investigations in the field of learning disabilities, however, have suggested some general guidelines that may enhance the validity of the data obtained during an interview.

The professional is encouraged to establish a feeling of mutual trust between herself or himself and the individual being interviewed. For example, the professional should avoid questions that will alarm the individual and arouse feelings of defensiveness. It is further recommended that the professional maintain objectivity in order to prevent an emotional involvement that will limit his or her effectiveness. At the same time, authors have suggested that the professional adopt a cooperative, accepting, empathetic manner that helps the individual to feel more comfortable and supported (Rimm & Masters, 1974).

Another guideline is related to the kinds of questions an interviewer asks, particularly of teachers. Tombari and Bergan (1978) demonstrated that the use of general, open-ended questions resulted in teacher statements that were more consistent with a medical model. Teachers perceived a problem as existing within the child that adversely influenced their perceived ability to solve it. The use of questions that requested specific information regarding child behavior and settings resulted in statements that were more consistent with a behavioral model. The use of descriptive behavioral terms resulted in more positive teacher expectancies regarding their ability to affect a change in their students.

### *Interview Formats*

As defined earlier, an interview is a set of responses to oral or written questions, or to inventories of items, that yield information regarding a student's medical, psychological, educational, and socioeconomic background (Adelman & Taylor, 1983). This definition suggests that the structure of the interview may vary.

*Unstructured Interviews.* An unstructured interview involves the use of a flexible format that imposes a minimum of restrictions on its participants. The topics selected for discussion are less standardized and vary across interviews. The professional is free to follow cues provided by the individual being interviewed; however, he or she must still ask the questions necessary to accomplish the goals of the interview. A number of investigations have reported the use of unstructured interviews with parents (Schwartz, Gilroy, & Lynn, 1976; Stott, 1976) and teachers of learning-disabled students (Elbert, 1984).

*Structured Interviews.* Structured interviews require that topics be discussed in a prearranged format. The professional directs the conversation with the individual with a minimal amount of digression. This format allows the professional to cover the same material in the same manner across interviews, as exemplified by the use of the Vineland Social Maturity Scale (Doll, 1953).

In a variation of the structured interview format, the individual responds to written questions that are forced-choice. For example, Levine, Clarke, and Ferb (1981) devised the Self-Administered Student Profile, which requires students to respond to items using "very true for me," "a little true for me," and "not true for me." The items are actual quotes from students and reflect eight dimensions: selective attention, memory, visual-spatial relationships, working efficiency, language, sequencing, and fine- and gross-motor skills.

*Semistructured Interviews.* This format is a modification of the structured interview and requires the individual to answer a series of prearranged questions, either orally or in writing. The professional then asks a series of open-ended questions. Semistructured interviews have been used primarily with parents of learning-disabled children by Adamson and Adamson (1979), Sloman and Webster (1978), Stevenson, Lee, Stigler, and Lucker (1984), and White (1983).

### *Practical Considerations*

Interviews may be included as part of an assessment battery used to diagnose a student's learning disability. They may be conducted with a variety of individuals, and with the use of different formats. In order to most effectively use the data obtained, the professional needs to be aware of the merits and limitations associated with the use of interviews.

Van Hasselt, Hersen, Whitehall, and Bellack (1979) described some of the benefits of incorporating an interview into the assessment process. During an interview, a professional may be able to elicit information that may otherwise be

unattainable. In addition, an interview with a student provides a discrete sample of interpersonal behavior. Additional advantages have been associated with the use of an interview (Bennett, 1982). It can document a student's progress toward annual goals and short-term objectives. It is a source of some of the data required for making eligibility and classification decisions. Finally, an interview may be very flexible, easily accommodating the needs of a particular assessment situation.

Unfortunately, the flexibility afforded by an interview is also the source of its major disadvantages: questionable reliability and validity. Estimates of reliability and validity are obtained by studying an assessment procedure under a specific set of administrative conditions. Because of the traditionally flexible nature of an interview, such specificity has not been achieved. One possible solution lies in the use of more structured interview formats, such as the one described by Sloman and Webster (1978): Trained professionals asked parents 27 prearranged questions but were allowed to rephrase a confusing question or to probe further if an answer was inadequate. The parents were reinterviewed after an interval of 6–12 weeks. A reliability of  $+ .74$  was found for the second assessment.

Another disadvantage that is attributed to the use of an interview is the bias that results from selectivity in recall. The accuracy of parental recall of early life experiences and developmental milestones has been doubted (Levine *et al.*, 1981). Ollendick and Hersen (1984) suggested ways in which to overcome bias: First, separate interviews can be conducted with the mother and father. Areas of agreement and disagreement are readily discerned and easily addressed. The accuracy of the data is also enhanced by asking parents, teachers, and students to focus on specific behaviors and recent events. Finally, an interview should be combined with formal assessment techniques in order to more accurately indicate present levels of educational performance.

### *Continuous Measurement*

The ongoing responses exhibited by learning-disabled students through the instructional day may provide a rich source of formative data. The measurement of these responses allows the professional to make rapid adjustments in the educational program, thereby ensuring the students' steady progress. Recent behavioral technology has advanced a number of techniques for monitoring the responses of learning-disabled students. Observational procedures, including frequency, rate, duration, task-analytic, permanent-product, and interval measurement may be very useful in producing a continuous record of students' work toward instructional objectives. Because these techniques are discussed in detail elsewhere in this book, they are discussed only briefly here.

#### *Frequency Recording*

This procedure is used to establish the number of times discrete behaviors occur. Because frequency or event recording involves a simple tally of re-

sponses, it may be very easy to use in applied situations. For example, a professional may evaluate an interpersonal-skill-training program by counting the number of prosocial interactions initiated by a learning-disabled student. Similarly, progress in a spelling unit may be evaluated by recording the number of words spelled correctly orally during spelling lessons.

Behaviors must have a relatively discrete start-and-stop time to be evaluated effectively with a frequency measure. Without a precise indication of the start and stop of a behavioral episode, little agreement would be reached on whether a day included numerous occurrences or one sustained occurrence. Similarly, responses of a constant duration are more suitable for frequency recording. A treatment program may reflect no change in the frequency of responses, whereas there is actually a substantial change in each response duration.

Simple frequency counts may be influenced by the amount of time available for observation. One day, for example, the professional may count 23 appropriate academic responses, the next she or he may record 24. One may erroneously conclude that the strength of academic responding was comparable on the two days unless it is known that, on the second day, school was dismissed in the early afternoon. Consequently, the day in which 23 episodes were reported represented lower behavior strength than the shortened day, on which 24 were reported.

To overcome this problem, frequency data obtained over variable periods of time can be transformed into rate data. Response rate is computed by dividing the number of occurrences of frequency by the period of time over which the student was available for observation. As an example, a student may volunteer answers three times in a 30-minute period, two times in a 40-minute period, and one time in a 20-minute period. The respective rates of responding computed with the formula,  $\text{Rate} = \text{frequency}/\text{time}$ , would be  $3/30$  or  $.10$ ;  $2/40$  or  $.05$ ; and  $1/20$  or  $.05$ .

A variety of instructional aids may be used to increase the professional's efficiency in frequency or rate recording. Mahoney (1974), for example, demonstrated the use of an abacus watchband, Lindsley (1968) used a golf counter, and Holeman and Baer (1978) piloted the use of a beaded bracelet for young children's self-recording. These devices are particularly useful in the classroom because they allow the teacher to "overlap" data collection procedures with other instructional responsibilities.

The recording sheet presented in Figure 1 illustrates a standard format for storing data over extended time periods.

### *Permanent Product*

A number of responses that are of interest to professionals result in tangible products. "On-task" behavior, for example, results in completed assignments. Composition produces written passages. These products may be measured in a manner similar to event recording except that, rather than counting transitory responses, the educator counts the lasting product. The major advantage of this procedure is that permanent products of students' behavior (e.g., seat work,

**Student** \_\_\_\_\_  
**Teacher/Clinician** \_\_\_\_\_  
**Behavior** \_\_\_\_\_

**Time of Observation**

<b>Date</b>	<b>Frequency</b>	<b>Start</b>	<b>Stop</b>	<b>Total</b>	<b>Rate</b>

FIGURE 1. Format for recording rate data.

homework, quiz responses, and shop projects) may be collected and analyzed at times convenient to the professional.

Measures of permanent products reported in the professional literature have ranged from being highly complex to being very simple. On the complex end of the continuum, Helwig, Johns, Norman, and Cooper (1976) demonstrated an elaborate scoring procedure for measuring the rate of students' correctly formed letters.

In order to compare permanent products from one day to the next, the task demands must remain relatively constant. Using problems with varying levels of difficulty, providing varying levels of assistance, or spending different amounts of time may obscure the conclusions that may be drawn from the data. As with frequency data, differences in the amount of time available for the student to complete the permanent products (e.g., math problems, sentence composition,

or light industry assemblies), may be controlled by recording the rate of production. This is accomplished by dividing the number of products completed by the amount of time available. For example, writing 10 sentences in a 20-minute period would result in a rate of .5 sentences per minute.

### *Task-Analytic Measurement*

Task analysis is the principle strategy used by many learning disabilities specialists to break complex behaviors down into their component parts or skills. In forward chaining, the professional develops the first component skill until a success criterion is achieved. He or she then initiates instruction on the second skill, linking it to the previously mastered response. Once criterion is again achieved, a third component skill is introduced. This process continues until all of the component skills are mastered and the complex behavior is performed to criterion. In backward chaining, the process is reversed by teaching the last skill in the sequence first, then the second to the last skill, and so on.

A professional's ability to recognize when criterion on one component skill is achieved and a second skill may be introduced is a major factor in the effectiveness of task-analytic teaching. Moving from instruction in one component skill to the next too quickly results in gaps in the learner's performance of the complex behavior. Moving too slowly is likely to bore the student or make inefficient use of the available instructional time. For this reason, task-analytic assessment is an important part of instructional programs for learning-disabled persons.

There are four important attributes of task-analytic assessment, as illustrated on the form in Figure 2. First, the short-term objective is listed at the top of the sheet. This, of course, is the complex behavior that is comprised of the component skills. Second, the component skills are listed sequentially from the first to the last skill taught. Third, spaces are available for recording a series of trials. Task-analytic assessment is not a static process. Data collected in a given session should represent numerous opportunities for the student to perform. Finally, a code is available for the teacher to score the component skill as being performed to criteria or as not being performed to criteria.

Task-analytic data are best summarized by reporting the number of component skills performed to criteria on the final trial of the instructional period. It must be emphasized that this summary is a gross measure of the learning-disabled person's progress in acquiring component skills over time. It does not indicate the specific skills over time. It does not indicate the specific skills acquired or the level of prompts used in skills below criterion. These data must be obtained from the individual recording sheets.

### *Duration Recording*

Duration recording is useful for evaluating any objective relating to the period of time a student spends engaged in a behavior. Latency recording assesses the period of time that elapses for some cue (e.g., a teacher's request to sit



Student \_\_\_\_\_ Date \_\_\_\_\_

Short-term objective \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

+ = performed to criteria      - = not performed to criteria

Component skill	Trial									
	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

FIGURE 2. Recording format for task analytic assessment.

down) to the time the learner engages in the target behavior (e.g., the student sits down). These recording procedures are used to monitor changes in the amount of time children and youths spend engaging in activities.

A form commonly used to collect duration data is illustrated in Figure 3. The professional enters the time the behavior begins and ends. The difference between the ending time and the beginning time is the duration for one episode. A given observation period (e.g., a class period or a school day) may include a number of episodes. These individual durations may be summed to produce the total duration for the period. As with the other observational procedures, these data may be adversely influenced by the amount of time available for observations. A day on which the student was observed for three hours cannot be compared to a day on which he or she was observed for six hours. Therefore, these units may be converted into percentage data by dividing the total duration by the time available for observation. For example, a student may have three episodes of "out-of-seat" behavior lasting 2, 6, and 10 minutes. The period during which he or she was available for observation was 40 minutes long. Therefore, he or she was reported to be out-of-seat for 45% of the period.

*Interval Recording*

Unlike duration measures, interval data are useful for monitoring behaviors that do not have obvious start or stop times. Also, unlike frequency and rate

recording, interval data are sensitive to changes in the length of time during which a response occurs. Interval data are collected by sampling the student's behavior within a portion of the school day. For example, a 6½-hour day may include two or three time samples of 10 minutes each. These time samples are then divided into shorter intervals (e.g., from 5 to 60 seconds). The response is then scored as occurring or not occurring during each interval. The resulting measure is the percentage of intervals sampled in which the target behavior occurred. When the time periods during which interval recording is conducted are picked at random, and when the amount of time sampled is sufficiently long, the resulting data accurately represent the student's behavior through the entire day.

To illustrate this procedure, Marholin and Steinman (1977) used an interval method to record on-task behaviors of special-needs adolescents. The authors

**Student** \_\_\_\_\_  
**Teacher/Clinician** \_\_\_\_\_  
**Response** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date	Beginning Time	Ending Time	Duration

FIGURE 3. Duration data recording sheet.

**Student** \_\_\_\_\_

**Teacher** \_\_\_\_\_

**Response** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Length of Interval** \_\_\_\_\_

**+ : occurrence**

**- : nonoccurrence**

**Interval**

<b>Date</b>	<b>Time</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>%</b>	<b>Scored +</b>

FIGURE 4. Interval data recording sheet.

divided 5-minute observation periods into 20 10-second observation intervals, each followed by 5 seconds for recording. An observation period was scored on-task if the learner was engaged in the assigned academic task for nine seconds of the 10-second interval.

Three procedures are described in the literature for scoring interval data. Each may be useful, depending on the instructional conditions or target behaviors. *Whole-interval* recording involves the scoring of responses only if they occur throughout the total duration of the interval (e.g., 10 seconds of laughing in a 10-second interval). *Partial-interval* recording involves scoring responses if they occur at any time during an interval (e.g., one pencil tap during a 15-second interval). Finally, *momentary-interval* recording involves scoring responses only if

they are occurring at the precise time the interval ends (e.g., talking at the time the interval ends).

Intervals, as well as other recording procedures, may be used to assess the responses of a number of students at the same time. Exemplifying this, Kazdin (1980) described an interval procedure in which one child is observed in the first interval, a second child is observed in the second interval, a third child is observed in the third interval, and so on until all of the children are observed. Then the recorder returns to the first child, repeating the sequence. This process may continue until all of the children are observed for a reasonable number of intervals.

A standard sheet for recording interval data is presented in Figure 4. A (+) or (-) in each square is used to denote the occurrence or nonoccurrence of the behavior at the end of the interval (if momentary-interval recording is used), through the entire interval (if whole-interval recording is used), or at any time during the interval (if partial-interval recording is used). The number over each square indicates the time of the interval. Finally, the data are transformed to report the percentage of intervals in which the behavior occurred by dividing the number of occurrences by the number of intervals.

### *Interobserver Agreement*

As with paper-and-pencil tests, the most complex and complete system is of little value if it produces inaccurate or unreliable estimates of the learning-disabled student's performance. Interobserver agreement is the primary method of judging the reliability of an observational system. Interobserver agreement is the rate of correspondence between two independent persons' observations. The procedure for collecting interobserver agreement data varies, depending on the measure of behavior strength. Interobserver agreement is determined by two individuals (e.g., the teacher and his or her aide) independently collecting data over the same time period. Following a data collection session, a reliability coefficient is produced by dividing the lowest frequency by the highest frequency. Interobserver agreement for permanent product data would be computed in a similar manner. At the end of the performance period, the teacher collects and evaluates the learner's products. He or she then requests that the other person use the same procedures to evaluate the products. Finally, the reliability coefficient is determined by dividing the smaller score by the larger score.

Interobserver agreement for task-analytic recording is somewhat more difficult to compute. As in the other procedures, two independent observers monitor the student's performance over a number of trials through the task sequence. Then, the ratio of agreements to the number of trials is computed for each subskill. This process produces separate interobserver reliability coefficients for each subskill. The average of these coefficients for the entire task sequence is the overall interobserver-reliability coefficient for the task-analytic recording system.

Interobserver agreement on duration or latency data is computed by simply dividing the shorter time by the longer time reported by independent observers.

The rate of interobserver agreement for interval data is determined by dividing the number of intervals in which both observers scored an occurrence by the total number of intervals (excluding intervals during which both observers scored a nonoccurrence).

The adequacy of a given agreement rate is determined in part by the difficulty with which the behavior is measured. Affective behaviors such as "smiles" or "sad expressions" produce necessarily lower reliabilities than discrete responses such as "words pronounced" or "problems correct." Also, the reason for which the data were collected suggests the level of acceptable reliability. Program placement decisions should be based on highly reliable data, whereas decisions affecting the use of peripheral instructional materials or free-time activities may be made on the basis of less reliable data. In general, reliability coefficients exceeding .70 may be considered adequate for most instructional decisions. Interobserver agreement coefficients at the lower end of this range should produce more frequent reliability checks. Coefficients at the higher end of this range need not be tested as often.

Low interobserver-agreement coefficients suggest that the target response has not been adequately defined. Redefining the behavior in more clear and complete terms is likely to improve the rate of interobserver agreement. Also, the practical or logistic aspects of the measurement system may limit its reliability. A study of the responses that the two observers disagreed on may suggest ways of improving the measurement system.

### *Analyzing Observational Data*

Data obtained on the preceding summary sheets are most easily interpreted when presented in a line graph format. This format, illustrated in Figure 5, includes six major features:

1. The horizontal axis of the graph reports the time associated with each measurement. For the most educational purposes, this axis is labeled "day," "class period," or "session."
2. The vertical axis reports the measures of behavior strength. These may include frequency, rate, measure of permanent product, subskills performed in a task sequence, duration, or percentage of intervals.
3. Also accompanying the measure is an operational description of the target response (e.g., the rate of words identified).
4. Vertical lines occur in the graph to denote the onset of intervention or program change. Adjoining this line should be a brief description of the program change (e.g., "change in medication," "increase response cost," or "use high-interest materials").
5. Missing data points are denoted by connecting points adjacent to the point or points with broken lines.
6. Follow-up data, used to demonstrate that the program had a lasting effect on the learner's performance, are displayed by adding a vertical line at the end of the formal program and labeling a new phase "follow-up." The time line

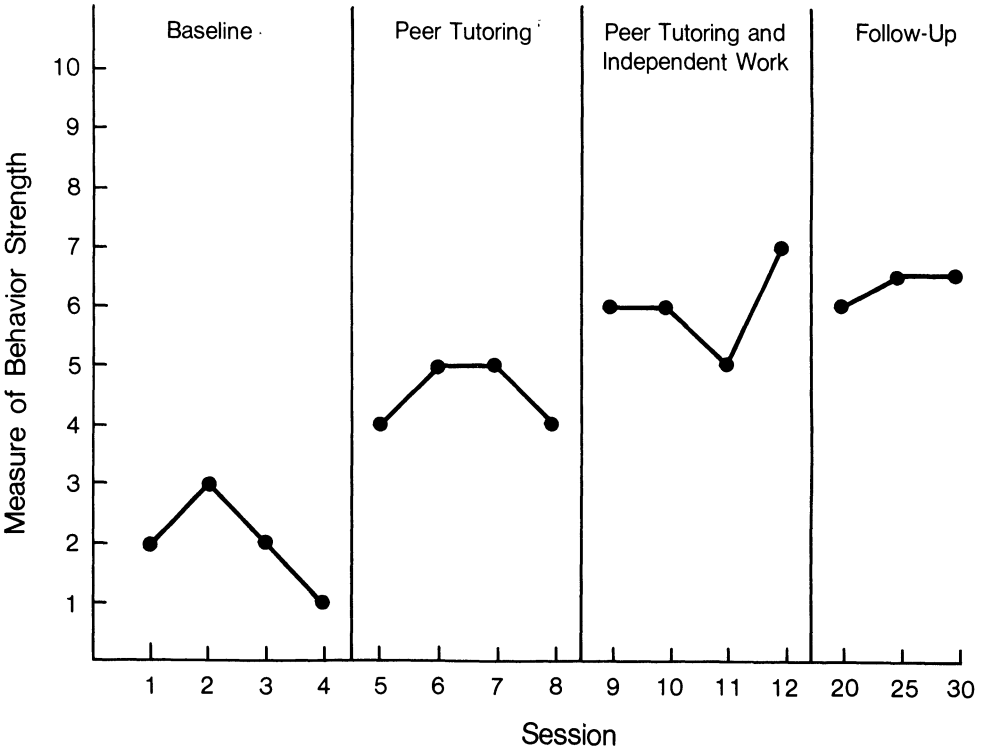


FIGURE 5. Conventional graph for displaying observational data.

or vertical axis is labeled to reflect the days on which follow-up data are collected. These points are not connected unless they occur on adjacent days or sessions.

The same systematic observation procedure may be applied to more than one behavior in one setting (e.g., simultaneously recording a student's rates of math, spelling, and writing assignment completion), the same behavior of the student in multiple settings (e.g., simultaneously recording a student's rate of negative self-statements in the gym, the hallways, and the lunchroom), and the same behavior of several students in the same setting (e.g., simultaneously recording Billie's, Jim's, and Karen's percentage of problems completed correctly). The format for graphing these data, illustrated in Figure 6, allows the professional to make comparisons between the variables selected.

*Visual Inspection of Data*

Four criteria for analyzing observational data have been discussed in the literature (Kazdin, 1982). The criteria may be used by a professional to judge the strength of the intervention procedure in changing the student's behavior. Although they will be discussed separately here for the sake of clarity, it is impor-

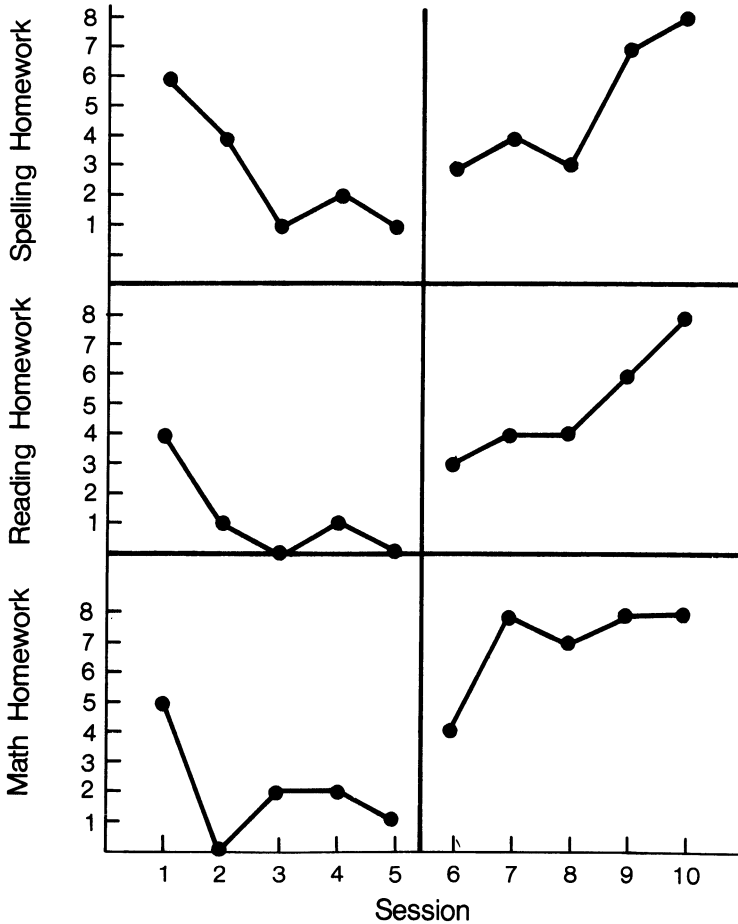


FIGURE 6. Observational data for multiple objectives.

tant to recognize that the four criteria interact with each other to produce a clear representation of program effectiveness.

The *mean* is probably the most frequently applied criterion for analyzing program effectiveness. It refers to the average measure of the behavior during a given program phase. One would expect a larger mean rate of performance over the baseline average following the introduction of a program designed to increase independent sentence composition. Conversely, a professional may expect a decrease in the mean rate of disruptive social responses following the introduction of a punishment procedure.

The *level* is another commonly used measure of differences between program phases. Level involves the comparison of data points immediately preceding and following a phase change. As with the mean, one would expect a change in the level of performance immediately following intervention. The larger this change, the stronger is the impact of intervention on the target response.

The *trend* is the slope of the best fitting straight line between the points in the baseline and the intervention phases. Along with expecting a change in the mean and the level, the teacher may anticipate that the person's performance will gradually improve following the introduction of intervention. The stronger the change in trend from baseline to intervention, the more potent is the educational procedure. In the most extreme case, the baseline trend may be strongly decelerating while the onset of intervention coincides with a strongly accelerated trend. More subtle trend changes may involve a shift from a gradually accelerating to a strongly accelerating trend.

The *latency*, or the period of time that elapses from the start of the intervention to evidence of a performance change, is the final criteria used in the visual inspection of data. Powerful interventions, such as effective punishment procedures, typically produce a short latency from intervention to behavior change. For example, initiating a procedure in which the student remains in the classroom during recess if he or she talks out in class is likely to produce an immediate reduction in the rate of talk-outs. A less powerful procedure, such as simply ignoring the talk-outs, may take substantially more time to produce an initial reduction in the behavior.

## CONCLUSIONS

The assessment techniques reviewed in this chapter may be used in programs for learning-disabled persons for three major purposes: diagnostic evaluations, summative evaluations, and formative evaluation. As a conclusion to this chapter, we discuss the relationship between the preceding assessment techniques and these evaluation functions.

*Diagnostic evaluation* involves collecting assessment data for the purpose of applying an appropriate diagnostic label. The operative elements of the federal (PL 94-142) definition of learning disabilities are (1) a discrepancy between overall academic functioning and performance in oral expression, listening comprehension, written comprehension, basic reading, reading comprehension, mathematics comprehension, or mathematics reasoning; (2) the student's disability occurring despite the availability of learning experiences appropriate to his or her age or ability level; and (3) the absence of motor handicaps, visual handicaps, mental retardation, emotional disturbance, and environmental, cultural, or economic disadvantage as primary causes of the learning problem.

Based on this definition, a diagnostic evaluation must establish the general academic and intellectual performance of the learner, the academic performance in specific curricular areas, the absence of other handicapping conditions, and the availability of appropriate educational experiences. The norm-referenced measures discussed earlier may be effective in establishing the learner's general and specific academic competence. These measures may also be used to rule out other handicapping conditions as a primary source of learning problems. Final-



ly, interviews with the learner, his or her parents, and previous teachers may indicate the quality of previous learning environments.

*Summative evaluation* provides a "summary" of the student's educational progress over an extended period of time. Once the diagnosis of a learning disability is made, the individual is likely to be placed in a suitable educational program. The results of summative evaluations should confirm the quality of this program. Quarterly, biannual, or annual progress checks should demonstrate that the educational services are effective in ameliorating the deficient skills while the learner continues to progress in general achievement domains.

Again, norm-referenced measures are primarily used in summative evaluations. Annual achievement tests, for example, allow the professional to make reasonably valid comparisons between previous and current performance levels. These comparisons allow the professional to confirm that the diagnostic placement was and is appropriate. Unfortunately, summative evidence that satisfactory progress is not being made is often obtained after the learning-disabled individual has spent a substantial amount of time in an ineffective program. Consequently, more frequent informal evaluations must occur to ensure that steady progress will be made between summary periods.

*Formative evaluation* serves this purpose by providing frequent measures of the learning-disabled person's instructional progress. In general, formative evaluation is the ongoing assessment of the learning-disabled student's progress toward instructional objectives. Formative evaluation procedures are typically embedded in each lesson plan so that performance changes resulting from each session can be identified. The major value of these techniques is that they allow the professional to make "in-flight" instructional decisions. The frequent collection and analysis of student performance data allow the professional to continually refine instruction to reflect the learner's changing needs.

Criterion-referenced tests and observational procedures are the primary tools for obtaining formative assessment data. Each of these procedures may be applied on a session-by-session, daily, or weekly basis to demonstrate continuous progress toward related instructional objectives. For example, the goal of instruction may be that the learner will become able to recognize the 220 Dolch basic sight words. Weekly criterion-referenced tests measuring the 10 sight words used in instruction for that week should indicate that the learner is progressing toward the mastery of the 220 words. After a semester of instruction, formative assessment data (the criterion-referenced tests) should indicate that the learner has mastered all of the words. These data may also correspond with a summary evaluation of sight word recognition.

In conclusion, this chapter has discussed the diagnosis and assessment of students' learning disabilities. Emphasis was placed on the diagnostic techniques used to confirm the presence of a learning disability, the summative measures used to ensure the long-term benefits of instructional services, and the formative measures of short-term progress toward instructional objectives. As is apparent from the discrepancy view conveyed in the federal definition, learning-disabled individuals represent a highly diverse set of characteristics. The specific

performance deficits that result in one person's being diagnosed as learning-disabled are likely to be substantially different from those apparent in another individual. Consequently, the diagnostic, summative, and formative measures that are used with any individual must reflect the specific hypotheses regarding the discrete areas in which a discrepancy may occur. The actual selection of instruments from those reviewed here must, therefore, be a function of the information sought by the professional to confirm (1) the presence of a performance discrepancy; (2) the absence of other primary handicaps; (3) the long-term effectiveness of services; and (4) the short-term impact of instruction. It has been our intention to provide resources from which these decisions may be made.

## APPENDIX: AVAILABLE NORM-REFERENCED TESTS

### *Intelligence*

Detroit Test of Learning Aptitude, Bobbs-Merrill, 1967.

A comprehensive instrument for learners 3 years old to adulthood. Includes 19 subtests for measuring a variety of psychological abilities, including reasoning, judgment, verbal ability, number ability, and motor ability.

McCarthy Scales of Children's Abilities, Psychological Corporation, 1972.

A test for children between 2½ years and 8½ years of age. Includes 18 subtests grouped over six overlapping scales, including verbal, perceptual-performance, quantitative, general cognitive, memory, and motor.

Stanford-Binet Intelligence Scale, Houghton Mifflin, 1960.

For subjects 2 years of age through adulthood. Contains a series of items, increasing in difficulty, grouped by age level, including vocabulary, number concepts, memory, reasoning, and visual motor.

Wechsler Intelligence Scale for Children—Revised, Psychological Corporation, 1974.

A general intelligence test for children aged 6 to 16 years and 11 months. Includes two subtests, verbal and performance, which cover many skills, including vocabulary, arithmetic, block design, digit span, and object assembly.

### *Basic Reading Skills and Reading Comprehension*

Durrell Analysis of Reading Difficulty, Harcourt Brace Jovanovich, 1955.

The test is for nonreaders to those at the sixth-grade level and samples oral reading, silent reading, listening comprehension, and word recognition and word analysis.

Gates-MacGinite Reading Tests, Houghton Mifflin, 1978.

Screening tests designed to assess skill development from kindergarten through twelfth grade. There are seven levels of the test, and each samples vocabulary and comprehension.

Gray Oral Reading Test. Bobbs-Merrill, 1967.

The test is designed to provide an objective measure of skill development in oral reading from early first grade through college. It consists of a series of graded reading passages that the tester reads aloud; the subject is then asked to orally answer literal comprehension questions.

Woodcock Reading Mastery Tests, American Guidance Service, 1973.

A battery of five subtests used to assess skill development in reading with learners in kindergarten through Grade 12. It includes letter identification, word identification, word attack, word comprehension, and passage comprehension.

### *Mathematics Reasoning and Calculation*

KeyMath Diagnostic Arithmetic Test, American Guidance Service, 1971.

A test that assesses math skill development in kindergarten through the eighth grade. The test includes 14 subscales organized into three areas: content, operations, and applications.

Stanford Diagnostic Mathematics Test, Harcourt Brace Jovanovich, 1976.

There are four levels of the test, sampling behavior from students in Grades 1.5 to high school. Each level consists of three subtests: number system and numerals, computation, and applications.

### *Listening Comprehension and Oral Expression*

Goldman-Fristoe-Woodcock Test of Auditory Discrimination, American Guidance Services, 1976.

The test is designed to assess the listener's ability to distinguish speech sounds under noisy and quiet conditions from 4 years of age on.

Illinois Test of Psycholinguistic Abilities—Revised, University of Illinois Press, 1968.

The test is designed for children between 2½ and 10 years of age. It consists of 12 subtests that evaluate abilities in receptive, organizing, and expressive psycholinguistic processes.

Peabody Picture Vocabulary Test, American Guidance Services, 1980.

This test of receptive language is best used with learners of ages 2.3–18.5.

The learner looks at a page with four drawings, listens to a word read by the examiner, and indicates which picture illustrates the word.

Test of Language Development, Empiric Press, 1977.

This test is best used with children from 4 years to 8 years and 11 months of age. Each of the five major subtests deals with spoken language and includes picture vocabulary, oral vocabulary, grammatical understanding, sentence imitation, and grammatical completion.

### *Written Expression*

Test of Written Language, Pro-Ed, 1978.

This test is appropriate for children of ages 8.6–14.5. The seven subtests are

vocabulary, thematic maturity, thought units, handwriting, spelling, word usage, and style.

Test of Written Spelling, Pro-Ed, 1976.

This device is best suited for children of ages 6–13 to assess a child's spelling competency. Two subscales test both predictable and unpredictable words.

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# 22 *Hearing Impairment*

WILLIAM J. HELSEL

## INTRODUCTION

Audition plays an important role in our everyday functioning. One's ears serve to locate sources of sound within the environment and also serve in orientation. Physiologists are aware that localization of sound is lateral, or left to right. Detection of sound by hearing persons, if the source of stimuli is in front or behind, is accomplished by transforming the discrimination to a lateral decision by turning the head. Wallach, Newman, and Rosenzweig (1949) demonstrated that the human ear can, to a fraction of a millisecond, detect and discriminate whether the sound entered the left or the right ear first. Hearing has been described as ubiquitous, multidirectional, and mandatory (Altshuler, 1974; Myklebust, 1960). Audition has also been shown to play a major role in information processing. As a sensory registrar, it serves as a major source of information about our environment (Moray, Bates, & Barnett, 1965). Conrad and colleagues (Conrad, 1964, 1972; Conrad & Hull, 1964) have demonstrated the importance of acoustics to short-term memory of hearing persons and more important, the reliance on visual stimuli of deaf persons for short-term memory. Further review of the research on audition could fill this volume, but the conclusion drawn from such a review can be condensed into one sentence: Audition is integral to everyday functioning and survival.

For persons with auditory deficits, psychological implications abound (Freedman, 1967; Goodenough, 1932; Moores, 1982; Myklebust, 1960). Individuals with physiological aberrations of the auditory system are at a disadvantage that makes achievement more difficult (see Freedman, 1967, for further explication). To further complicate an already overwhelming disability, a number of hearing-impaired persons are multiply handicapped (Schein, 1975). Schein argued that a second disability results in, not an addition to, but a multiplication of problems. In a review of the literature and his own work, emotional disturbance or behavior problems are discussed as the most prevalent secondary disability of the hearing-impaired. The purpose of this chapter is to examine this assertion.

First, a brief section is devoted to defining the nomenclature associated with auditory deficits. Then, the available literature on psychopathology in the hear-

ing-impaired is reviewed. In this attempt to further delineate the prevalence of emotional disturbance with sensory-impaired persons, the reader will find that few systematic efforts have been made to examine behaviors exhibited by emotionally disturbed deaf children (Matson & Helsel, 1987); Reivich & Rothrock, 1972). Special considerations are discussed in the third portion of this chapter, including the role of language and how it relates to deafness. Integration of the concerns evolving from these first three sections are taken into consideration in the fourth section on assessment of psychopathology, which briefly reviews behavioral assessment, interviewing, and standardized testing for assessing psychopathology. To date, little has been published in this area; therefore, this section is composed of potential adaptations from other aspects of the childhood psychopathology literature. The contents of this section are biased by this author's selections and are in no way exhaustive or conclusive. Finally, overall trends and future directions are discussed.

## DEAFNESS

Current incidence estimates for the hearing-impaired in the United States are 2 million deaf, with an additional 12 million persons suffering some form of milder hearing impairment (Neisser, 1983). Schein and Delk (1974) reported a total of 1.8 million deaf persons in the most recent controlled census. Over half this population had an age of onset older than 50. A portion of this population, approximately 420,000, fell under the rubric of prevocationally deaf, or those who never had the ability to hear and understand speech before the age of 19. Of these, a majority were deaf before the age of 3. The estimate of school-aged children with hearing impairments during this same time interval was 90,000, with two-thirds of this population in elementary school (Adler & Williams, 1974). These estimates are intimately related to the definitions used for sampling the population.

The nomenclature surrounding deafness is disparate, so that there is no way to make generalizations between research studies. Persons with auditory aberrations have been labeled at different times as *deaf*, *deaf-mute*, *hard of hearing*, *hearing handicapped*, *congenitally deaf*, *adventitiously deaf*, *prelingually deaf*, *postlingually deaf*, *prevocational deaf*, or *postvocational deaf*. Clarifications of this profusion of terms have been attempted on at least two occasions, in 1937 and in 1970. The former was an attempt by the Committee on Nomenclature of the conference of Executives of American Schools for the Deaf (Newby, 1964). They proposed that deaf persons are those with hearing that is nonfunctional for conducting ordinary aspects of life. Further, this group could be dichotomized into those born deaf (i.e. the congenitally deaf) and those born with functional hearing who had illnesses or accidents and became deaf (i.e. the adventitiously deaf). A second grouping, constituting the bulk of this population, includes those with defective but functional hearing with or without a hearing aid (i.e. the hard of hearing).

In 1970, Lillywhite, Young, and Olmsted, in an effort to avoid the dichotomy of congenital versus adventitious, felt that greater validity would be pro-



vided by viewing deafness as a continuum. They proposed that "the *deaf* are viewed as a group whose hearing losses have occurred early in life and are severe enough to prevent the normal development of language and speech" (p. 55). This definition is in line with the most currently cited definition of deafness as the inability to hear spoken language and to discriminate and reproduce speech (Neisser, 1983). The hard of hearing are those who use defective hearing as the main source of their development of speech and language. Although not frequently cited, it appears that the definitions presented by Lillywhite *et al.* (1970) are those most widely accepted. These are currently being advocated under the rubric of prelingually and postlingually deaf. Language onset is used as the point of demarcation; children who become deaf before the development of language are considered prelingually deaf, and those who become deaf after the onset of language as postlingually deaf. The number of people advocating these terms is increasing.

The definitions outlined by Lillywhite *et al.* (1970) are adhered to throughout this chapter, and *hearing-impaired* is used as an umbrella term to include both the deaf and the hard of hearing. An attempt is made to discuss the research with the use of these definitions. However, this approach is not possible in all cases. In those cases where the sample is not clearly defined, the term *hearing-impaired* will be used.

## PSYCHOPATHOLOGY IN THE HEARING-IMPAIRED

Research on the hearing-impaired and emotional disturbance was quite scarce in the literature for two-thirds of this century (Haggerty, 1925; Lyons, 1934; Matson, Macklin, & Helsel, 1985). At different times, researchers have pointed out the lack of extensive study. In 1938, Samuel A. Kirk stated that "the behavior, personality adjustment, and emotional thwartings of the deaf have not been extensively studied" (p. 131). Nearly one-half century later, Reivich and Rothrock (1972) stated similarly that "little has been done to describe systematically the behavior problems of the deaf" (p. 93). The literature on emotional disturbance could be characterized as recurring blemishes with few research studies and nearly half the published papers being reviews. Each review has resulted in a similar summary of research findings, which demonstrate that nonhandicapped children are better adjusted than deaf children, that male deaf children have greater behavior problems than female deaf children, that deaf children evidence emotional immaturity, that deaf children frequently exhibit impulsive and aggressive behavior, and that the etiology of deafness may make a difference in overall adjustment. These findings appear to be straightforward and unambiguous. Nonetheless, we have apparent redundancy and ambivalence in the literature. Altshuler and Spady (1978), while discussing a first program for the study of research and therapy, inform the reader that psychiatrists have been interested in the deaf for only 20 years and, further, that systematic observations taking development into consideration do not exist. This finding is alarming, given that emotional disturbance in the hearing-impaired was

being questioned for nearly half of a century. To date, there has been little concerted effort to form a systematic body of research to examine this question. Some efforts to explain what is known follow.

In November 1966, a large-scale survey was conducted at a California residential school for the deaf (Meadow & Schlesinger, 1971). These authors argued that a survey of emotional disturbance and deafness was necessary because of changing parameters in deaf student populations. They pointed to differences in etiological patterns compared to a generation earlier and to technological changes in medicine resulting in increased survival rates of severely handicapped deaf children, as two major factors contributing to the need for further information on the rate of emotional disturbance with deafness. The procedure was to ask 34 teachers and 46 primary-care workers to rate 516 deaf children on, first, the existence of emotional disturbance and, if present, whether or not it was severe or moderate. Severity was based on the informants' judgments on the need for psychiatric referral (severe) and behavior problems requiring inordinate amounts of teacher attending time (moderate). Originally, the questionnaire was adapted from a mental health survey designed for the Los Angeles County Schools. The results were that 31.2% of all the rated deaf children exhibited emotional disturbance. Of these, 11.6% were rated as severely emotional disturbed and in need of psychiatric care, and 19.6% were rated as disruptive and requiring teacher attention. In comparison, the Los Angeles County Department of Mental Hygiene (1960) survey of 532,567 school-aged children found results similar to those published by the Joint Commission on Mental Health of Children in the United States (1970). Meadow and Schlesinger's sample evinced rates five times greater for severe disturbance and three times greater for moderate emotional disturbance than in the general childhood population. The authors concluded that their concern was justified and that there was a need for further investigation.

One of the most comprehensive surveys to date was conducted by the Annual Survey of Hearing Impaired Children and Youth (ASHICY; Gentile & McCarthy, 1973). They surveyed multiple handicaps (e.g., emotional disturbance, mental retardation, perceptual-motor disorder, visual disorder, cerebral palsy, heart disorder, brain damage, orthopedic disorder, and epilepsy) across four years (1968–1969, 1969–1970, 1970–1971, and 1971–1972) in a number of academic programs and found consistent results. The survey procedure was to have informants complete an item for each hearing-impaired child that listed these nine possible additional handicaps. This item was to be completed by marking present or absent for each additional handicap manifested by the hearing-impaired child rated. Throughout the four-year period, 42,513 students were evaluated. Each year, approximately 31% of all children surveyed manifested secondary or multiple handicaps. Emotional and behavior problems were noted most frequently for all four years, ranging from 18.9% in 1971–1972 to 30.8% in 1969–1970. This latter estimate is in line with the figures presented by Meadow and Schlesinger (1971). The second most commonly endorsed handicap was mental retardation, with 17% in 1969–1970 and 19.2% in 1968–1969. In discussing their results, these authors emphasized that their survey was conducted

with children currently enrolled in educational programs for the hearing-impaired. Children who are the most severely multiply handicapped are less likely to be enrolled in educational programs. It would not be difficult to substantiate this conclusion. In a survey of institutions for the mentally retarded, Lloyd (1973) demonstrated that 10–15% of the residents manifested a significant hearing impairment. So it seems plausible that a number of multiply handicapped hearing-impaired children would be excluded from a survey of educational programs for the hearing-impaired.

Schein and Delk (1974) gathered information about the general health of hearing-impaired persons in the National Census of the Deaf Population. The procedure used in this survey was to ask a significant other if he or she was aware of any additional handicapped condition in the hearing-impaired person. The age range of the sample was 1–64 years. Specific conditions observed were, from high to low ratings, asthma, vision problems, neuropsychiatric conditions, arthritis, heart trouble, mental retardation, cerebral palsy, and cleft palate. A consistent finding with those reported in the ASHICY survey was a rate of additional handicaps of approximately 33%. The authors concluded by cautioning the reader that, because of the nature of data collection, many illnesses could have gone undetected and that the survey, by including elderly persons, reported higher rates of physical ailments. However, the frequency of additional handicaps was demonstrated to be high, further emphasizing the likelihood that emotional disturbance and poor adaptation to the general environment would accrue.

Two subsequent studies reported lower rates of emotional disturbance in hearing-impaired persons (Jensema & Trybus, 1975; Schildroth, 1980). In a survey from the Office of Demographic Studies, Gallaudet College, Jensema and Trybus (1975) reported that 9.8% males and 5.6% females, or a 7.9% total, suffered from emotional or behavioral problems. The sample was 43,946 children enrolled in schools for the hearing-impaired. More recently, Schildroth (1980) reported that 8.3% of students enrolled in public residential schools have emotional or behavioral problems. Also, both studies evinced higher rates of emotional disturbance with increasing numbers of additional handicaps. The figures from these two studies are similar to the number of students enrolled in programs for the socially and emotionally disabled during the same time period (Craig & Craig, 1980). As of late 1979, according to Craig and Craig (1980) 13% of all multiply handicapped deaf children were enrolled in programs for deaf emotionally disturbed persons.

Each of the surveys discussed has a number of methodological shortcomings that call into question the reliability and validity of the estimates. A major weakness is the lack of a clear-cut definition of both hearing-impairment and emotional disturbance. As indicated earlier, there are no standard objective criteria for the diagnosis of emotional disturbance in the hearing-impaired; therefore, researchers conducting surveys must rely on subjective as well as retrospective responses of various informants. Nearly all of the studies discussed above lack reliability components. These studies did not attempt to formally analyze rater consistency. Because of this lack of reliability, questions of

validity cannot be addressed. In addition, without a systematic knowledge of emotional disturbance in the hearing-impaired, the validity of the ratings must be questioned. This brings us to a paradox of modern behavioral assessment; comprehensive assessment is expensive and external funding is dependent on demonstrations of sufficient cause.

The costs of adequate psychiatric and psychological assessment of psychopathology are tremendous. However, grant review boards are not likely to provide adequate funding for an initial research project that is both time- and cost-intensive. Therefore, initial stages of investigations are in many ways forced to evade methodological questions because of economic necessity. Thus, whether one adheres to the 10% or 30% rates of emotional disturbance, these studies just reported cannot and should not be criticized too harshly. At the very least, they serve to demonstrate a need for further research and to point to the seriousness and extent of the problem. Finally, the results reported were based primarily on the detection of emotional and behavioral problems. It is highly likely that the informants would have recognized and reported problems only after repeated occurrences, which would lead to the increased validity of their reports.

One of the earliest studies falling within a second literature grouping, pencil-and-paper testing, was conducted by Samuel A. Kirk (1938). The purpose of the study was to compare hearing-impaired children with nonhandicapped children on the Haggerty-Olson-Wickman Behavior Rating Schedule. This scale was developed using norms based on nonhandicapped children. The scale consisted of two parts, A and B. Part A was composed of 15 items indicating behavior problems and was rated on a 4-point scale, from nonoccurrence to frequent occurrence. Part B was analogous to an adaptive behavior scale, with items falling into four domains: intellectual traits, physical traits, social traits, and emotional traits. These items were rated on a 5-point scale with idiosyncratic phrases for each item. Teachers were asked to rate 112 hearing-impaired children from 7 to 16 years of age. In discussing the results, Kirk (1938) informed the reader that Part A was not valid. Nonetheless, he concluded that hearing-impaired children demonstrate greater behavior problems than nonhandicapped individuals, and that hearing-impaired males rate higher than hearing-impaired girls. The results from Part B were deemed valid and showed that hearing-impaired children differed from nonhandicapped children on emotional and social traits, that hearing-impaired males scored higher than all other groups, and that no significant differences were noted between the deaf and the hard of hearing.

Some well-designed and recognized methods of assessment have been used in prior research. Myklebust (1960) administered the Minnesota Multiphasic Personality Inventory (MMPI) to a group of adults at Gallaudet College, an international college for the deaf, and to a group of the hard of hearing in the Chicago area. The MMPI is composed of nine major scales: Depression, Hypochondriasis, Hypomania, Hysteria, Masculinity-Femininity, Paranoia, Psychasthenia, Psychopathic Deviate, and Schizophrenia. Myklebust, like Kirk, addressed the issue of validity. He noted that the deaf did not run into language difficulties and that this finding had been determined through "intensive statis-

tical analyses." Other problems were noted, however, and item analysis showed that a number of items had been determined to be of questionable validity for deaf subjects. Noting these qualifications, Myklebust discussed the results. Once again, females were found to be better adjusted than males in both the deaf and the hard-of-hearing groups. Schizophrenia was the most deviant score observed for deaf males and females. The hard-of-hearing group scored highest on depression. It was concluded that deaf persons are more likely to exhibit detachment and isolation. Myklebust went on to qualify his results as follows:

What does this mean in terms of these personality test results? It indicates that extreme caution must be used in the interpretation of the results. Furthermore, the response of a deaf person cannot necessarily be interpreted according to norms for a hearing person. While such norms must be used it is necessary for the psychologist to be aware of the need for the deaf to behave differently under certain situations and circumstances. Therefore, in general, we have interpreted the high scores on the Schizophrenia Scale as not necessarily meaning that the deaf are schizophrenic, but that as compared to the hearing they felt detached and isolated from other people. Such detachment and isolation, at least to some extent, might be a natural consequence of deafness and not represent a condition of mental disease. (p. 381)

The results warrant considerable caution.

The two studies reviewed above typify many conducted throughout the 1940s and 1950s (i.e., Burchard & Myklebust, 1942; Knapp, 1948; Levine, 1958; Springer & Roslow, 1938). The findings were similar to those outlined earlier. Most important, all authors felt it necessary to qualify their findings. Therefore, the reader is left to determine the meaningfulness of each study. In addition, the ambiguity is increased further by a closer look at the instruments used. The findings from research with these assorted instruments provide little workable information on emotional and behavioral problems. The problems noted were discussed in obscure terms and do not lend themselves to a delineation of behaviors that constitute emotional immaturity or emotional maladjustment (Vernon, 1961).

A first attempt to remedy this major shortcoming was a study conducted by Reivich and Rothrock (1972). These authors asked 33 teachers at state schools for the deaf in Kansas to evaluate 327 subjects on the Quay-Peterson Behavior Problem Checklist (Quay & Peterson, 1967). The scale consists of 55 items describing behaviors, each of which is rated present or absent. Once the test was administered, the data were subjected to factor analyses. The results were that the factor structure of the behavior problem checklist for deaf children closely resembled that of other hearing samples studied with this scale. In addition, these authors noted two new factors that were unique and in line with deafness. Caution is once again warranted in making quantitative comparisons because of the study's nature. Tentative quantitative comparisons, however, reveal that deaf children and youth are more likely to act out or to be impulsive, unreflective, and uninhibited. This study was one of two factor analyses located in the literature. Hirshoren and Schnittjer (1979) also sampled day-school deaf children on the Behavior Problem Checklist and found varying results. As in the results noted by Reivich and Rothrock (1972), factors synonymous with earlier research

were noted. In contrast, this second study did not, however, result in any factors that could be construed as unique to the deaf.

The research discussed up to this point has been oriented toward questions of whether emotional disturbance exists and, to a lesser degree, what the types of disturbance are. Research has also been conducted on the social-emotional characteristics of deafness (Altshuler, 1974). For instance, a series of studies have been conducted examining the results of integration on hearing-impaired subjects (Bowyer & Gillies, 1972; Bruinicks & Kennedy, 1974; Craig, 1965; Elser, 1959; Farrugia & Austin, 1980; Meadow, 1976; Reich, Hambelton, & Houdin, 1977; Rodda, 1969, 1974; Van den Horst, 1971). The findings can best be characterized as mixed and at times inconsistent. Elser (1959) concluded that deaf persons were not accepted by peers. Rodda (1969) reported that deaf students were better accepted than hard-of-hearing persons. Bowyer and Gillies (1972) contradicted these earlier results, noting no difference except in one small subgroup. In another related study, Bruinicks and Kennedy (1974) concluded that young deaf students were accepted by their peers. Despite these disparate results, two major trends were evident from this research. First, integration appears to be advantageous for academic performance, but it is inversely related to social adjustment. Second, social adjustment is directly related to social rejection and social isolation (Farrugia & Austin, 1980). Social rejection and the resulting social isolation appear to be related to behaviors perceived as different by non-handicapped peers (Kates & Kates, 1965; Markham, 1972; Schiff, 1973). Also, these social responses lend credence to the low self-esteem of deaf students noted by some researchers (Garrison, Tesch, & DeCaro, 1978). If such a relationship is indeed the case, then a means of assessing these social behavior excesses or deficits would be beneficial.

Social skills research on children has seen a rapid proliferation since the mid-1970s (Michelson, Sugai, Wood, & Kazdin, 1983). This increase in clinical and research attention is a result of the recognized importance of socially skilled behavior in an increasingly social culture. Those children deficient in appropriate social behaviors encounter social rejection, which results in eventual social isolation. At the other extreme of the continuum are the excessive inappropriate social behaviors (i.e., social aggression) exhibited by children. If anything, these behavioral excesses result in a much more rapid rejection by peers and significant others. Thus, it is vital that assessment and treatment techniques be developed to address this issue. To date, one assessment study examining social skills of the hearing-impaired was located, but no treatment studies were found.

Recently, Matson, Macklin, and Helsel (1985) examined the possible utility of the Matson Evaluation of Social Skills with Youngsters (MESSY) in assessing the social skills of hearing-impaired children and youths. In their two-part study, Matson *et al.* (1985) looked first at the reliability of teacher ratings of social skills and then at the relationship between social skills, behavior problems, and self-concept. Teachers were asked to rate, on three scales, 96 hearing-impaired youths from a residential school with a mean age of 14.8 years. These measures included a 62-item Likert-type teacher's version of the MESSY (Matson, Rotatori, & Helsel, 1983); an 11-item A-M-L Behavior Checklist (Dorr & Cowen, 1973); and

an 80-item Piers-Harris Self-Concept Scale (Piers, 1972). The major findings were that teachers can rate social skills reliably with the MESSY and that behavior problems are negatively correlated with appropriate social skills and are positively correlated with inappropriate social skills. This study is valuable because of the discrete nature of the MESSY items. The items were developed from an examination of social behaviors most commonly discussed in the available social skills treatment literature, as well as from behavior checklist scales. These results suggest that the scale should be highly treatment-sensitive and can be used for targeting behaviors in need of intervention. If further investigation shows the MESSY to be valid in the assessment of social skills in hearing-impaired children, clinicians will be able to systematically pinpoint responses for treatment.

Generally, the literature indicates that emotional disturbance and behavior disorders are particularly prevalent in hearing-impaired children and adults (Altshuler, 1974; Moores, 1982). High rates of aggression and impulsive behavior are likely, along with low rates of depression and obsessive-compulsive behavior (Altshuler, 1971; Denmark, 1969). Reivich and Rothrock (1972) referred to the former as alloplastic or acting-out behavior and to the latter as autoplasic or acting-in behavior. In a similar grouping of psychopathology with hearing children and youths, Achenbach (1978) grouped hyperactive, aggressive, and delinquent behaviors into a second-order factor labeled *externalizing*, and schizoid, depressed, uncommunicative, obsessive-compulsive complaints, and somatic complaints were grouped into a second-order factor labeled *internalizing*. These groupings were based on results from administering a child behavior checklist. This finding is not to argue that internalizing behaviors are nonexistent among the hearing-impaired, only that they are likely to be less prevalent. For instance, the hard of hearing are overrepresented among samples of persons suffering paranoid schizophrenia in later life, although its prevalence in the prelingually deaf is similar to that found in nonhandicapped populations (Cooper, 1976). This finding contrasts with Myklebust's data discussed earlier. These studies point to a need to ferret out the differences between deaf and hard-of-hearing individuals.

Another contribution of the literature is the need to look at several variables in addition to hearing impairment. Demographic differences would be expected similar to those found in the general population of children without hearing impairments. Among the hearing-impaired, a greater number of emotionally disturbed children in smaller families, broken homes, and Catholic families were found. Also, these children tended to be under age 13 (Meadow & Schlesinger, 1971, 1975). Degree of hearing impairment is also an important factor to consider, as exemplified in the Cooper (1976) study just discussed, as well as in the integration studies discussed earlier. Finally, the literature indicates a need to look at the role that multiple handicaps play in emotional disturbance (Luhr, 1972; Schein, 1975).

All of these variables are in need of further investigation. It also seems that a need exists for recent prevalence figures. This situation can be ameliorated with research designed, first, to develop assessment techniques and, then, to examine prevalence rates and treatment methods. Obviously, it is difficult to examine

prevalence and to treat emotional disturbance if one cannot accurately assess the problem. Unfortunately, the hearing-impaired pose an additional problem in the question of assessment because of the difficulties inherent in communicating with them. Before examining potential assessment techniques, some of the special considerations in communicating with the hearing-impaired are discussed.

## LANGUAGE: A SPECIAL CONSIDERATION

Communication plays an integral role in the emotional maturation of the hearing-impaired (Altshuler, 1974; Cohen, 1980; Denmark, 1968). Before we discuss this vital role, it is important to note that this section will not be devoted to a discussion of the concept of language. Theoretical discussions on the "innate mechanism" of language (Chomsky, 1957, 1969) or on language as learned behavior (Skinner, 1957; Sundberg, 1983) are beyond the scope of this chapter. Instead, this section is devoted to the functional component of language communication, and to its effect on emotional maturation.

Additionally, the population to be discussed will be the large, heterogeneous hearing-impaired group. Traditionally, language discussions are dichotomized into the deaf versus the hearing, with the unfortunate exclusion of the hard of hearing. This heterogeneous group that makes up the bulk of the hearing-impaired is placed somewhere in the middle of a continuum unaccepted by the populations at either extreme (Jacobs, 1980). Many of the hard of hearing do have residual hearing that can be improved with the use of a hearing aid, but this should not imply an ability to function uninhibited in a verbal language world. In fact, as mentioned earlier, Cooper (1976) demonstrated that the prevalence of paranoid schizophrenia is higher in the hard of hearing than in the deaf and hearing populations. Often, a significant number of hard-of-hearing people function in a range of hearing that presents a good deal of ambiguity for an auditory diagnostician and an inability to categorize these individuals into a deaf or hard-of-hearing grouping. So it seems best to refrain from arbitrary dichotomies and to adhere to Lillywhite *et al.*'s continuum of functioning (1970).

Scharoff (1959) was one of the first to examine the implications of restricted communication on emotional and intellectual development. In 1974, Altshuler discusses the importance of language in the communication of emotion as well as in child-parent bonding. Later in his paper, Altshuler (1974) argued that "the most common and widespread type of disturbance is the childhood behavior disorder, which more often than not turns out to be a problem of family as well" (p. 372). He pointed to the problems of the family that arise from the "child's silence," which may evolve later into emotional disturbance. Behavior problems appear to be more prevalent in families with a hearing-impaired child and hearing parents, constituting approximately 90% of the population, although behavior problems are not completely absent in families of hearing-impaired children and hearing-impaired parents (Mindel & Vernon, 1971). Earlier, Denmark (1968) also examined the implication of communication difficulties in emotional disturbance by pointing to an inability to verbalize feeling; as a result, the hearing-



impaired child manifests feelings through physical behavior. For instance, a child who cannot express anger verbally is more likely to have a temper tantrum, resulting in the destruction of property or aggression toward another person. In addition, it would not be an overgeneralization to suggest that the majority of the articles reviewed earlier discussed communication difficulties as an important factor in emotional disturbance and deafness. If communication is an important variable in emotional disturbance, then remediating communication difficulties could potentially lessen the prevalence of emotional disturbance.

Language instruction has accounted for and still does account for the majority of empirical studies and reviews published on hearing impairments (Gardner & Zorfass, 1983). The central issue for professionals in the field is the great oralism versus manualism debate among special educators. Oralism can be defined as an instructional method designed for developing speech and lipreading skills along with reading and writing, while restricting manual language. Manualism incorporates sign language and fingerspelling with oral training. There are a number of various oral methods as well as a continuum of manual methods that have evolved in the United States.

Within the last 100–120 years, communication instruction for the hearing-impaired has moved from both oral and manual, to oral only, and back again to oral and manual (Jacobs, 1980; Neisser, 1983). The oralists dominated hearing-impaired communication instruction for 80% of this time period, and the revitalization of manual instruction has come about only within the last 25 years. This change was slow and not without controversy, even though the verdict from the hearing-impaired community had been evident many years earlier. The hearing-impaired—more specifically, the prevocational deaf—number approximately 420,000 (Schein & Delk, 1974). The number of persons using American Sign Language, a traditional manual communication used by the prevocationally deaf, is approximately 500,000 (Neisser, 1983). These numbers are not purely coincidental. In speaking out as a hearing-impaired adult Jacobs (1980) portrayed the frustrations of a large portion of the hearing-impaired community who were subjected to oralism without manualism. These people believe they were deprived of their childhood years because of an inability to communicate with the world around them. Hearing parents are also speaking out concerning their dejection resulting from having an hearing-impaired child, their feelings of inadequacy derived from being unable to promote speech in their children, and their feelings of relief and ecstasy in being able to see their child communicate, albeit, manually (Harris, 1983; Spradley & Spradley, 1978). Why has oralism dominated past communication instruction of the hearing-impaired?

This controversy has been stimulated for several reasons. Oralism came to dominance in the United States during the period of progressivism (Button & Provenzo, 1983). During this fervor of the nineteenth century, beliefs surrounding the communication instruction of the hearing-impaired were compelling (Neisser, 1983). These were beliefs that gestures were tools of the devil and speech was God-given, that hearing-impaired children would lose the will to speak because manual language is easier for them, and, most important, that signs would inhibit speech. At the heart of the controversy between oralism and

manualism has been this latter inherent assumption that manualism would deter verbal behavior (Myklebust, 1960). Evidence of this cause-effect relationship appears to be minimal and, if it exists at all, contradictory. So this controversy has been maintained by relying on the religious beliefs of parents, the undying hope of parents that their child would have normal hearing, and the beliefs that technology would ameliorate the hearing impairment and that signing would inhibit speech. This argument was compelling and thus dominated for many years.

By 1965, communication instruction had begun to change (Neisser, 1983). This situation was evidenced by the appearance of articles questioning the apparent effectiveness of total communication or the establishing of the most effective communication training technique with no restriction on methods (Evans, 1982; Jacobs, 1980). An example is an article written by an instructor of the hearing-impaired, a self-proclaimed oralist, who wrote in the 1965 edition of the *American Annals of the Deaf* about incorporating fingerspelling with her oral method (Stafford, 1965). Since the late 1960s, the literature has also experienced a proliferation of books about the hearing-impaired world as perceived by both hearing and hearing-impaired persons, in particular, their perceptions of the role of manualism (Gannon, 1981; Greenburg, 1970; Harris, 1983; Holcomb, 1977; Jacobs, 1980; Neisser, 1983; Spradley & Spradley, 1978; Watson, 1973). These authors have all spoken of an opening up of a new world for the hearing-impaired through signing, as it provides a means of communication without inherent shortcomings and, more important, an acceptance of their being different.

Total communication provides remediation of a portion of the difficulties. Since Stokoe (1960) raised the possibility of American Sign Language being linguistic, considerable research has been done. Incidentally, Stokoe's work was a major precipitating factor, a catalyst, in the change from oralism to total communication, although the debate is in no way ended. A large majority of the work on sign language is coming out of the Salk Institute for Biological Studies in La Jolla, California (Bellugi, Klima, & Siple, 1975; Klima & Bellugi, 1979). Current research is also addressing the inherent assumption of the oralists that sign inhibits speech. Gardner and Zorfass (1983) demonstrated that signing, if anything, promoted speech in a hearing-impaired child. Current trends seem to be pointing to sign as the native language of the hearing-impaired and to total communication as the mode of instruction. This trend is not a tacit argument for the removal of oralism. Research on oral techniques should continue as long as they are not used at the expense of hearing-impaired children's early development.

The transition to total communication brings about new difficulties. Of concern here is the ability of mental health professionals to communicate with hearing-impaired clients. One possibility is to provide an interpreter for each consultation or to hire a full-time interpreter for each service facility. Unfortunately, this approach is both expensive and impractical: What are the effects of having an interpreter present during an interview? The other alternative is to train mental health professionals in manualism. Herein lies a major difficulty.

Because of the history of sign language in the United States, a widespread difference of opinion exists on what constitutes sign language. The hearing-impaired community uses American Sign Language, with regional differences. A majority of hearing persons with sign language skill use a "pidgin" form of sign incorporating American Sign Language signs into English syntax (Costello, 1977). The hearing-impaired have grown accustomed to communicating with hearing persons using the hearing person's "pidgin" sign language. In contrast, few hearing people have developed the ability to use American Sign Language fluently with the hearing-impaired. Typically, hearing people who are proficient in American Sign Language come from homes of hearing-impaired parents or siblings (native signers). Part of this difficulty can be attributed to a lack of standardization. To date, there exists no standardized form of manual instruction. No recommendation on the form that this instruction should take is made here, but a process is suggested. Is it possible to have a series of forums with both hearing-impaired and hearing professionals concerned with communication instruction? If so, it seems likely that resolutions could be made and could eventually have an impact on communication instruction.

Two major outcomes of standardized instruction would be the remediation of certain emotional disturbances caused or nurtured by communication difficulties and a lessening of the communication difficulties between the hearing and the hearing-impaired worlds. It is this author's contention that a valid assessment of psychopathology is contingent on first-person communication between client and professional. A professional with competent manual skills could provide direct services to entire hearing-impaired families as well as to hearing-impaired individuals.

As in all areas discussed to this point, little work has been completed on the assessment of psychopathology in hearing-impaired children. It is being argued here that a major factor contributing to this paucity of literature is the communication barrier between the hearing-impaired and the hearing. Achievement of an understanding of psychopathology in the hearing-impaired for eventual remediation of these conditions depends on transcending this barrier. It is not prudent to argue that this barrier is impenetrable. Given the assumption that the communication difficulties can be diminished, the first step in better understanding psychopathology is assessment of the behaviors. The remainder of the chapter will be devoted to this topic.

## ASSESSMENT OF PSYCHOPATHOLOGY IN THE HEARING-IMPAIRED

Behavioral assessment has been described as a process that takes the shape of a funnel moving from global to specific (Nelson & Hayes, 1981). In discussing his *Behavioral Assessment Grid* (BAG), Cone (1977) dichotomized behavioral assessment techniques into indirect and direct. Indirect assessment techniques include interviews, self-report, and ratings by others. Direct assessment techniques include direct observation both *in vivo* and in analogue situations, as well as self-monitoring. From this author's perspective, funneling is a process of

moving from indirect to direct behavioral assessment. If this process is followed, it is likely that the assessment will be accurate: "In behavioral assessment the most important feature of an assessment device is its accuracy, i.e., its sensitivity to the facts (or what is true) about behavior it is being used to discover" (Cone, 1981, p. 54). Accuracy is rapidly taking on an importance perhaps equal to reliability and validity in discussions of meaningful assessment. The purpose of this brief section on assessment is to address, first, indirect assessment techniques and then direct assessment techniques that this author believes can provide an accurate assessment of behaviors exhibited by the hearing-impaired.

Issues emanating from controversies between traditional psychometric techniques and behavioral assessment are not addressed in this chapter. If the reader is interested in examining further the meaning of accuracy and other issues surrounding behavioral assessment, Hersen and Bellack (1981) have provided an excellent edited practical handbook with chapters on these issues. Instead, the purpose of this section is to discuss three assessment techniques: interviewing, standardized tests, and behavioral observation. Each of these topics has been discussed in some detail in various chapters of this book and is therefore discussed in a cursory fashion here, with particular emphasis on how it may be applied to the hearing-impaired.

### *Interviewing*

This author was unable to locate research on interviewing techniques designed for assessing emotional disturbance in hearing-impaired persons. Reference to interviews has been made in a number of service articles (e.g., Altshuler & Spady, 1978). However, articles researching interviewing techniques were not present. Several interviews for children without hearing impairments have appeared in the literature and could be modified for the hearing-impaired. Three of these are (1) the Kiddie-Schedule of Affective Disorders and Schizophrenia (K-SADS; Chambers, Puig-Antich, & Tabrizi, 1978), developed from the Schedule of Affective Disorders and Schizophrenia (SADS) by Endicott and Spitzer (1978); (2) a structured interview developed by Herjanic and Campbell (1977); and (3) the Child Assessment Schedule (CAS) developed by Hodges, Kline, Fitch, McKnew, and Cytryn (1981). Because of an earlier chapter on interviewing in this volume, these techniques are discussed here only briefly.

The development of the original Schedule for Affective Disorders and Schizophrenia (SADS; Endicott & Spitzer, 1978) is described concisely in Blashfield's text (1984) on the classification of psychopathology. Between the second and third edition of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM-II, 1968; DSM-III, 1980), Spitzer, Endicott, and Robins (1975) collaborated on a classification system of schizophrenic and affective disorders, the Research Diagnostic Criteria (RDC), which was the predecessor to the newly restructured DSM-III. The RDC is based on explicit criteria that were elicited from a structured interview, namely, the SADS. In 1978, Chambers *et al.* developed a version of the SADS for children ranging from 6 to 16 years old and titled it the Kiddie-SADS (K-SADS). The interview is composed

of information gathered from the child alone and from both parents and school. At the conclusion of the information gathering, symptoms are rated as present or absent, along with the degree of their severity if present. Kazdin (1981) noted that interrater (interscorer) reliability was "relatively high" ( $r = .65$  to  $.96$ ). Two major criticisms of this interview's utility for the hearing-impaired are that it is narrow of breadth in assessing only affective and schizophrenic disorders and, as pointed out by Hodges, Kline, Stern, Cytryn, and McKnew (1982), that it is "awkward" and lengthy. This latter shortcoming is of major concern because of the already necessary complication of a language conversion from verbal to total communication.

A second interview with potential utility for the hearing-impaired was first developed by Herjanic *et al.* (1975) and was researched further by Herjanic and Campbell (1977). In this study, the authors administered their interview to both psychiatric and pediatric child populations. The results indicated an ability to differentiate the two populations in six major areas: relationship problems, behavior at school, school learning problems, neurotic symptoms, symptoms of psychosis, and antisocial behavior. The interviews were administered to child and mother by a designated individual. Certain items were deemed by the authors to be more appropriate for one or the other respondent and were addressed accordingly. Even though this research addressed only the yes-no items depicting symptoms and not severity, the results are encouraging. Like the K-SADS, the Herjanic *et al.* (1975), interview consists of a long list of standardized questions, consequently posing similar difficulties.

The final interview to be discussed is the Child Assessment Schedule (CAS; Hodges *et al.*, 1981). An article by Hodges *et al.* (1982) discusses the use of the interview in both research and clinical settings. This particular piece of research is complete and encouraging because of an interrater agreement component based on videotapes of 60% of the interviews. The reliability was analyzed statistically with Cohen's kappa (Cohen, 1960), and the resulting kappa scores were around  $.60$ . According to the criteria presented by Hartmann (1977), these results are very good. The interview itself consists of two components: a semi-structured interview and an examiner observation section. The former is an interview built on 75 questions presented as an informal discussion. The second section is composed of 53 items addressing the child's personal characteristics (e.g., appearance and abilities) and behavior exhibited in the interviewing environment. This research is encouraging for two reasons: (1) the interview is shorter in length, and (2) the developers emphasized the importance of rapport. Positive rapport between interviewer and interviewee is vital for accurate assessment and therefore lends credence to the results reported by these researchers.

Each of these interviews has its strengths and weaknesses. As in all decisions on the appropriateness of behavioral assessment, the needs of the assessor must be clearly stated before selection. Interviewing hearing-impaired clients involves the additional concern of communicating ideas. Hopefully, research based on the conversion of current interviews found in the literature or the development of new empirically based interviews specifically addressing the hearing-impaired will occur.

## *Standardized Tests*

This section provides a survey of tests and scales based on traditional psychometric techniques. An attempt is made to dichotomize this survey into an assessment of academic intelligence (e.g., cognitive functioning) and an assessment of emotional disturbance. Because of the extensive literature on both topics, as well as the review in earlier chapters of this volume, a limited discussion is presented. First, a review of a study surveying the most commonly used tests of cognitive functioning in the hearing-impaired is presented. Second, four scales for assessing psychopathology are selected and reviewed for potential use.

An assessment of academic intelligence with various standardized scales provides additional information on intelligence. Michelson *et al.* (1983) noted several relationships between academic skills and social behavior. For instance, they discussed the slower rate of acquisition of academic skills in socially aggressive children than in nonaggressive children, as well as the relationship between social and emotional adjustment and later academic performance and intellectual achievement. From a perusal of this growing literature, it becomes apparent that a strong relationship exists. Thus, failure to assess for cognitive functioning results in an incomplete picture of the child's psychological functioning.

McQuaid and Aloviseti (1981) surveyed the psychological services for hearing-impaired children in New England and New York and determined that the most commonly administered tests were as follows: Wechsler Intelligence Scale for Children (WISC and WISC—Revised), Leiter International Performance Scale, Bender Gestalt, Human Figure Drawing, Draw-a-Person, Goodenough Harris Drawing Test, Wechsler Adult Intelligence Scale, Hiskey-Nebraska Test of Learning Aptitudes, Columbia Mental Maturity Scale, Illinois Test of Psycholinguistic Ability (ITPA), Peabody Picture Vocabulary Test (PPVT, PPVT-R), Beery Test of Visual Motor Integration, Thematic Apperception Test, and House-Tree-Person Test. The two most commonly used tests are the Performance scale of the WISC-R and the Leiter scale. This corroborates earlier findings (see Cantor & Spragins, 1977). It is important to note that neither of these scales has been standardized on hearing-impaired persons. In addition, the Leiter is a nonverbal test of intelligence with a number of shortcomings (Salvia & Ysseldyke, 1981; Sattler, 1982).

Unlike the WISC-R and Leiter scales, the Hiskey-Nebraska Test has been standardized on the hearing-impaired and has been compared with the WISC-R (Hirshoren, Hurley, & Hunt, 1977). Taddonio (1973) also demonstrated the utility of the nonverbal subtests of the ITPA. This work was, however, based on a comparison of the ITPA with the Leiter scale, consequently, caution in discussing the results is warranted. It is not surprising to see the Bender-Gestalt third on the list of the most commonly used tests. This measure of visual-motor ability is the most popular visual perception test, but it also has limitations. It is most commonly used as an indicator of impulsive behaviors characteristic of many

behavior disorders. Sattler (1982) recommended its use only as a screening device and not as a diagnostic test.

Continued discussion of the tests listed by McQuaid and Aloviseti (1981) will result only in the reiteration of two basic findings. Very few tests have been developed based on hearing-impaired samples, and the majority of tests most commonly used to assess functioning have psychometric inadequacies (Buros, 1978; Salvia & Ysseldyke, 1981; Sattler, 1982). Fortunately, this situation is beginning to change, as demonstrated by a recent edition of the Stanford Achievement Test standardized on the hearing-impaired (Allen, White, & Karchmer, 1983). It is hoped that this type of test standardization will continue, resulting in a battery of tests that will measure both intelligence and achievement adequately.

As discussed throughout the earlier sections of this chapter, scales used in the past to measure emotional disturbance in hearing-impaired children can be subjected to the same criticism as the tests of psychological functioning. To date, the scales have nearly all been normed on hearing populations and then applied to hearing-impaired samples. Instead of discussing the scales mentioned earlier, four scales are presented here. Three scales were selected based on the observations of Altshuler (1974) that behavior disorders are the most prevalent type of disturbance in the hearing-impaired. A fourth scale was selected because of its growing use with nonhandicapped children. These four scales are the Child Behavior Checklist (CBC; Achenbach, 1978); the Revised Behavior Problem Checklist (RBPC; Quay, 1983); the Matson Evaluation of Social Skills with Youngsters (MESSY; Matson *et al.*, 1983); and The Children's Depression Inventory (CDI; Kovacs & Beck, 1977). Once again, each of these scales is discussed in some detail in other chapters of this book, so they are discussed here only briefly.

The first two scales were selected because of the broad range of behavior problems assessed. Achenbach and Edelbrock, through a series of studies (Achenbach, 1978; Achenbach & Edelbrock, 1978; Edelbrock & Achenbach, 1980), developed the CBC. This scale is a parent report consisting of a seven-part section on social competence followed by 113 items on assorted behaviors to be rated not true, sometimes true, or often true. The designated age range is 4–16. Normative information is broken down into groupings by age and gender: boys 4–5 years old; girls 4–5 years old; boys 6–11 years old; girls 6–11 years old; boys 12–16 years old; and girls 12–16 years old. Through factory-analytic research on each age group, a host of behavior problem factors were noted, including aggressive, anxious, cruel, delinquent, depressed, hostile-withdrawal, hyperactive, immature, obese, obsessive-compulsive, schizoid, sex problems, social withdrawal, somatic complaints, and uncommunicative. Further, for each of the age groups, three broadband scores were found (internalizing, externalizing, and social). The first two were discussed earlier. The third is a score derived from the seven-part section on social competence. This scale, because of its breadth and its reliance on informant report, could prove useful in the assessment of emotional disturbance in the hearing-impaired. It requires no conver-

sion for hearing parents with hearing-impaired children, and the language could be converted for deaf parents with deaf children. A normative sample of hearing-impaired children could be examined.

A second scale that can also be used to assess a broad range of behavior problems is the RBPC (Quay, 1983; Quay & Peterson, 1983). This scale is a revision of the Behavior Problem Checklist (BPC) examined in two studies reviewed earlier in this chapter. In its revised form, the RBPC consists of 89 items scored as not a problem, a mild problem, or a severe problem. The items are rated by an informant. These items were drawn from an original pool of 150, which were administered to four large samples. Then, the data were factor-analyzed. The application of this statistical procedure resulted in four major factors: Conduct Disorder, Socialized Aggression, Attention Problem-Immaturity, and Anxiety Withdrawal, as well as two minor factors, Psychotic Behavior, and Motor Tension-Excess. Once again, because of the breadth of the behaviors assessed and the reliance on an informant, this scale could be used currently with the hearing-impaired. It has the same potential as the CBC, discussed above.

As pointed out by Farrugia and Austin (1980), social rejection is the result of behaviors exhibited by the hearing-impaired that are perceived as different by nonhandicapped peers. Therefore, in addition to measuring broad behavior problems with the CBC and the RBPC, a scale that examines a more specific group of behaviors seems necessary, in this case a scale that measures social behavior. The scale proposed for this task is the MESSY, which was discussed in some detail earlier (Helsel & Matson, 1984; Matson, Heinze, Helsel, & Kapperman, in press; Matson, Macklin, & Helsel, 1985; Matson *et al.*, 1983). This scale is available in two versions: a self-report and a teacher-report. The age range for which it is appropriate is 4–18. The self-report version is composed of 62 items rated on a 5-point scale ranging from not at all to very much. The teacher-report version consists of 64 items also rated on the 5-point scale.

These scales are based on statistical results from an original item pool of 92 items. This original form was administered as a self-report and also as a teacher report on two separate large samples. Therefore, the resulting shorter versions have a number of overlapping items, but they are also composed of differing items. Each version was subjected to factor analyses culminating in five factors for the self-report and two factors for the teacher-report. The self-report factors were Appropriate Social Skills, Inappropriate Assertiveness, Impulsive-Recalcitrant, Overconfident, and Jealousy-Withdrawal. Factors for the teacher report were Inappropriate Assertiveness-Impulsiveness and Appropriate Social Skills. This scale could prove useful because the items are descriptive of behaviors, although complex behaviors. "I look at people when I talk to them" and "I slap or hit when I am angry" are two examples of items from the self-report MESSY. Because of the structure of these items, they could be easily converted to a total communication format.

The final scale to be discussed in this section is the CDI (Kovacs & Beck, 1977). This scale was selected because it is the most frequently used measure of childhood depression (Kazdin, 1981). To this point, the prevalence of depression



in hearing-impaired children has not been established. As discussed earlier, depression is not thought of as being a major disturbance in the hearing-impaired. This scale could prove useful in examining this assertion. The CDI is composed of 27 items scored as absent, present but mild, and present frequently. It was originally developed as a self-report but more recently has been modified and administered as a teacher report (Helsel & Matson, 1984). The age range for the self-report is 7–17. The research to date on the self-report CDI has shown its utility as a depression scale both statistically and clinically (see Kazdin, 1981). The CDI teacher report is composed of the same 27 items; the only changes are in syntax. In the Helsel and Matson (1984) study, teachers were asked to rate students ranging in age from 4 to 18. The ratings were high in internal consistency. The scales were then factor-analyzed, and four factors emerged: Affective Behavior, Image-Ideation, Interpersonal Relations, and Guilt-Irritability. Both versions of the scale could be beneficial in the study of depression in hearing-impaired clients. The conversion from verbal to total communication for self-report on certain items could pose some difficulty. One example of an item that might be difficult to convey is "Nothing will ever work out for me." Once an understanding of the items can be ensured, this scale could prove useful as a self-report.

The astute reader will have noticed that these four scales suffer the same shortcoming noted in the research reviewed at the beginning of this chapter: they were all developed and normed on hearing samples. The adequacy of these scales for hearing-impaired children must be determined. This goal can be accomplished in a number of ways by examining the reliability and validity of each scale based on sufficient and appropriate hearing-impaired sample sizes.

### *Behavioral Techniques*

This final section does not deviate from the other sections of the chapter. A paucity of research using behavioral techniques exists in the hearing-impaired literature. In the early 1970s, Salzinger (1970), as well as Garrard and Saxon (1973), argued for increased use of behavioral techniques in the assessment and treatment of behaviors of multiply handicapped deaf children. Subsequently, a few articles have appeared using behavioral techniques with deaf-blind (Lancioni, 1980; Wilson, 1983) and mentally retarded hearing-impaired children (Leboeuf & Boeveris, 1981) but not with the hearing-impaired alone. This situation is unfortunate for a number of reasons but, most important, because these are the only techniques that provide a way to avoid the communication difficulties inherent in working with hearing-impaired children. Both interviewing and testing require communication with the client at some point. Behavioral techniques based on direct observation of behavior *in vivo* or in analogue situations require no communication between examiner and client, unless, of course, the behavior of interest is communication.

Suggestions for remediating this situation are twofold. First, an examination of the utility of behavioral techniques—in particular, single-case designs with hearing-impaired persons—is essential. This examination could be in line with

an article serving the same function with the visually impaired, written by Van Hasselt and Hersen (1981) and entitled "Applications of Single-Case Designs to Research with Visually Impaired Individuals" and published in *Visual Impairment and Blindness*. Components of this work are appropriate for the hearing-impaired and could easily be adapted. With the groundwork laid, it would then be possible to address a recommendation made by Salzinger (1970), that all individuals concerned with the hearing-impaired learn behavior principles. Given the increasing evidence of the efficacy of behavioral techniques (Rosenbaum, Franks, & Jaffe, 1983), this is apparently a recommendation that should not be ignored.

This section on assessment is characteristic of the whole chapter. A paucity of literature exists. Nonetheless, it should be obvious that there are major difficulties in accurately assessing emotional disturbance in hearing-impaired children. The majority of tests and scales used are inappropriate and outmoded. A large number of these scales measure concepts that are hard to define or to identify, as mentioned in an earlier section of this chapter. Current strategies should incorporate as many behavioral techniques as possible because of their reliance on nonverbal assessment (i.e., direct observation). More important, assessment research should be oriented toward the development of interviews, tests, and scales that can be communicated on a one-to-one basis to a hearing-impaired child. Until further research is completed taking communication into consideration, the prevalence of emotional disturbance will be left to question.

## DISCUSSION AND RECOMMENDATIONS

Assessment of psychopathology in hearing children is fraught with difficulties; thus, assessment of hearing-impaired children can only pose greater difficulty. This becomes obvious from a review of the sparse literature available in this chapter. It is apparent from the review that psychopathology in hearing-impaired children does exist, and that the prevalence and type of disorders should be of major concern to clinicians. The surveys reviewed ranged in prevalence estimates from 10% to 30%. The articles comparing scores for hearing-impaired and hearing children noted trends suggesting more abnormal behaviors in the hearing-impaired. However, we must be aware that the surveys were taken regarding psychopathology in the hearing-impaired without an existing nosology of psychopathology for this group, and that the scales administered to measure psychopathology were developed with hearing samples. Thus, the reader is left to determine the meaningfulness of the research results.

If there is a higher prevalence of psychopathology in the hearing-impaired, communication must be taken into consideration as a major parameter. As discussed in the special-consideration section of this chapter, an inability to communicate even the most concrete ideas must play a role in the child's well-being. This finding does not consider another important issue: the inability to communicate emotions and ideas. Evidence that hearing-impaired children will develop their own language to communicate if not provided a formal model (Goldin-

Meadow & Feldman, 1977) gives compelling evidence of the need to communicate. Current trends toward total communication can provide an environment of freedom and relaxation. This liberation can only help to facilitate a hearing-impaired child's development.

The role of communication in the assessment of psychopathology in hearing-impaired children is integral, with the exception of direct observation. Interviews, tests, and paper-and-pencil scales (self-reports) have an inherent communication component. Limitations in these devices will occur until the psychological implications of being hearing-impaired are taken into consideration in developing these techniques. Fortunately, behavioral techniques are available to fill the current void of adequately normed scales, at least to some degree. The assessment techniques available falling under the rubric of behavioral assessment—in particular, direct observation—do not require direct communication. It is from this piece of positive information that the future research on psychopathology in the hearing-impaired should embark.

A major advantage of the sparse literature on psychopathology in hearing-impaired children is that a greater number of questions than answers exists. Future research in assessment should begin at stage one and build systematically. The first stage is to compile a list of concisely defined behaviors exhibited by hearing-impaired children labeled as behavior problems or emotional disturbance. This stage can best be accomplished through direct observation. A second stage would be to develop a nosology of the behaviors that cluster together. This stage would provide a common language for clinicians and researchers. Much of this classification information is already available in the DSM-III categories, based on hearing children. In the DSM-III, each section devoted to a specific disorder contains a listing of the diagnostic criteria. These are listings of the symptomatology most commonly associated with these specific disorders in hearing children but could, in many instances, be directly applied to hearing-impaired children. Once stages one and two have been completed, scales measuring these behaviors could be made available in both self- and informant-report versions. The third stage would be to use the available measures to determine whether these behaviors exist and, if so, what their rates of occurrence are. If certain clusters of behavior exist in large numbers, a determination of etiology would be the next stage. Assessment will continue to play a role in the delineation of etiology. These recommendations are simplistic and global, but they should provide much needed direction.

Adherence to these recommendations depends on a positive interaction between hearing and hearing-impaired children. Little can be accomplished without the ability to communicate and, more important, the willingness to communicate. Jacobs (1980), in his concluding remarks, portrayed the working relationship between the hearing-impaired and the hearing as follows:

I believe that, in the final analysis, it is a matter of having the right attitude toward deaf persons. If you treat this venture as an ego trip, with missionary zeal, or as an easy career opportunity, it would be wiser for you to forget working with the deaf, and look elsewhere to satisfy your need for self-satisfaction. We can get along very well without hearing persons who "do good," patronize us or use us.

However, if you do have a real desire to know the deaf as real persons, and to regard them as equal individuals whose physical restraints have obliged them to communicate not only in a different language but also a unique modality, and subsequently develop their own culture, and if you are also willing to be totally immersed in that language and culture, then I am quite sure that you will be welcomed by the deaf community.

At the same time, there would be a limit to this involvement; from past experience, we are usually wary about going all the way toward including a hearing newcomer in our community. The question we first ask ourselves is: "What is he getting out of this?" Once we are convinced that he is genuinely interested in becoming our friend, we usually welcome him with open arms. At the same time, naturally, we do not expect him to forsake his own society. (p. 137)

Researchers interested in the question of psychopathology in hearing-impaired children must develop an understanding of what Jacobs was saying before they can expect to adequately examine the problems of the deaf and the hard of hearing. However, professionals are urgently needed, as are reasonable data that will enhance the accurate assessment of psychopathology. These efforts can and should improve the quality of life for this doubly handicapped group.

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# 23 *Visual Impairment*

VINCENT B. VAN HASSELT AND LORI A. SISSON

## POPULATION DEFINED

The past decade has witnessed a marked increase in clinical, educational, vocational, and research endeavors with the blind and visually impaired (see Biglan, Van Hasselt, & Simon, in press; Boyd & Otos, 1982; Warren, 1977, 1981). The heightened activity in this area is in response to the fact that nearly 11.5 million persons in the United States have some form of visual impairment, according to national health surveys (National Society to Prevent Blindness, 1980). Approximately 500,000 of these individuals are legally blind. Further, it is estimated that almost 37,000 children and youth in this country have this diagnosis, with about one-third being totally blind.

Although there is no universally accepted definition of blindness, the one used for most legal and economic decisions was originally part of the Social Security Act of 1935. This act was formulated mainly for the identification of aged individuals requiring increased benefits. According to this legislation, legal blindness is defined as:

visual acuity for distant vision of 20/200 or less in the better eye, with best correction; or visual acuity of more than 20/200 if the widest diameter of field of vision subtends an angle no greater than 20 degrees. (National Society for Prevention of Blindness, 1966, p. 10)

More simply stated, a person is considered legally blind if he or she can see no more at a distance of 20 feet than someone with normal sight can see at a distance of 200 feet, or if there is severe restriction of the visual field.

Considerable terminological inconsistency exists in the literature regarding level of vision. Terms such as *blindness*, *visual impairment*, *visual handicap*, and *partially sighted* are often used interchangeably when describing individuals with severe vision loss. Generally, use of the term *blind* is restricted to those who are totally blind or who have light perception only. *Visual impairment* is applied to

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persons with a severe loss of visual function requiring the use of special aids and other senses to reach performance levels ordinarily attained by the use of visual cues (Hoover & Bledsoe, 1981). More recently, texts specific to the field of vision have more frequently used the term *visually handicapped* to refer to children with impairments in the functioning or structure of the eye, irrespective of the etiology or the extent of the impairment. Rationales for the use of this term include (1) its adoption by the U.S. Congress as official terminology used by the Department of Education and (2) an awareness that the disorder causes limitations that, even when maximally corrected, disrupt normal learning through the visual sense (Taylor, 1973). In accordance with Barraga (1983), we use the term *visually handicapped* throughout this chapter

to refer to the total group of children who require special educational provisions because of visual problems. Such a definition is quite appropriate for educational purposes and should be encouraged to differentiate children's learning and developmental needs from those of adults, who may have additional or entirely different legal, vocational, and medical factors to consider. (p. 22)

In addition to a visual handicap being a physical condition, Warren (1981) pointed out that its effects "may extend far beyond the visual system itself to affect every area of development, both perceptual and nonperceptual" (p. 195). For example, with regard to perceptual functioning, serious vision loss results in a discontinuous and inaccurate information source concerning people and objects. Auditory input alone fails to provide this information to the degree permitted by the visual channel. Thus, the individual's access to his or her extended environment is sharply limited. For conceptual development, vision plays a major role in (1) the identification of objects and events; (2) the consolidation of disparate perceptual characteristics into more integrated concepts; and (3) the acquisition of concepts pertaining to the structure of physical space and spatial relationships. A number of studies have yielded data attesting to deficits in these abilities in visually handicapped children (see Warren, 1977).

Perhaps the most investigative attention has been directed to the effects of severe visual impairment on the socialization of blind children. For several years, there has been a consensus among workers in the field that a disproportionately large number of visually handicapped children exhibit problems in social functioning (see review by Van Hasselt, 1983). This hypothesis has been related to a variety of factors, including an inability to acquire interpersonal skills by modeling via the use of visual cues (Farkas, Sherick, Matson, & Loebig, 1981); difficulties in acquiring nonverbal social behaviors (e.g., facial expressions and physical gestures) (Van Hasselt, Hersen, & Kazdin, 1985a); inaccurate feedback concerning interpersonal effectiveness from the environment (Kleck, Ono, & Hastorf, 1966; Scott, 1969); a lack of knowledge of the appropriate social behavior (Richardson, 1969); deficits in assertion skills (Van Hasselt, Hersen, Kazdin, Simon, & Mastantuono, 1983); and negative reactions from parents and others in the visually handicapped child's social environment (e.g., Barry & Marshall, 1953; Sommers, 1944). In light of the demonstrated relationship between social competence in childhood and long-term functioning (e.g., Cowen, Pederson,

Babigian, Izzo, & Trost, 1973; Roff, 1961), many visually handicapped children may be at risk for maladjustment later in life.

The vision literature is also replete with discussions of emotional and behavioral problems in visually handicapped children and youth (e.g., Blank, 1959; Cruickshank, 1964; Jan, Freeman, & Scott, 1977; Van Hasselt, Kazdin, & Hersen, 1986). For example, Jan *et al.* (1977) examined evidence of psychopathology in 86 children who either were blind or had partial vision. Information from teacher ratings, parental reports, and psychiatric interviews with parents indicated that only 32% of the blind and 49% of the children with partial vision appeared to be symptom-free. "Developmental" disorder (i.e., peculiar and persistent deviations in specific, usually multiple, areas that were judged as having negative impacts on the child's total adaptation) was present in 41% of the blind and only 8% of partially sighted children.

The purpose of this chapter is to review assessment strategies for visually handicapped children. The need of examination of evaluation methods for this population is threefold. *First*, an awareness of the types and quality of measures used will allow more definitive conclusions to be reached concerning assessment research on the visually handicapped. Although many such investigations have been conducted (typically showing deficiencies in some area of functioning in severely visually handicapped persons), the questionable psychometric properties of many assessment instruments obfuscate the interpretation of results. *Second*, Public Law 94-142, which guarantees all handicapped children the right to a free public education in the least restrictive environment, has placed increased emphasis on the psychological evaluation in placement decision-making (Bauman & Kropf, 1979). *Third*, as Ellis (1978) cogently stated, "Appropriate assessment offers a better chance of providing the child with a suitable educational environment, and of defining more precisely the problems around which further specialization of care and training techniques should be concentrated" (pp. 397-398). Clearly, the determination of heuristic educational, habilitative, and psychological interventions for visually handicapped children requires comprehensive and technically adequate assessment.

## SPECIAL CONSIDERATIONS

### *The Examiner*

One of the first considerations in assessing visually handicapped children is the qualifications of the examiner. Expertise in assessment procedures includes familiarity with the available instruments designed specifically for the visually handicapped and common adaptations of instruments developed for nonhandicapped individuals. Further, the examiner must have an understanding of the nature and the needs of children with visual handicaps (Bauman, 1971a,b; Vander Kolk, 1977). The person conducting the psychological evaluation should know how to guide a visually handicapped child and should be able to explain

visual material to that child. If he or she cannot accomplish this comfortably, the assessment process and the results obtained from the visually handicapped examinee may be adversely affected (Bauman, 1971b). When young children are involved, a parent, teacher, or other familiar adult can often put the child and the examiner at ease by telling the examiner what assistance is necessary.

Also, the professional must examine his or her own attitudes toward and expectations of the visually handicapped (Bateman, 1965). Today, many sighted persons view visually handicapped individuals as equals in terms of ability to benefit from education and vocational training and to compete for employment. However, vestiges of earlier negative attitudes toward this population still remain. The sighted world's perceptions of the limitations inherent in blindness can be described in terms of a continuum with the following extremes: "blindness seen as a minor annoyance and hindrance to unencumbered mobility versus blindness seen as the greatest deprivation, sensory and emotional, that can befall man" (Bateman, 1965, p. 195). Attitudes about the visually handicapped person's role in society and extreme positions of either denying the real limitations of blindness or of imposing unreal and unnecessary restrictions can bias the interpretation of a child's behavior.

### *The Referral Question*

The psychologist, in conjunction with parents, school personnel, and other professionals, must formulate clear and specific questions to be addressed by assessment (Bateman, 1965; Bauman, 1973). For example, rather than evaluating a young child for the purpose of making an "educational prognosis," a series of specific diagnostic questions might be posed: Are the child's self-help skills in toileting, dressing, and feeding sufficient to handle age-appropriate demands? Is the child able to sit, attend, and follow instructions to the degree necessary in the classroom? Does the child use his or her hands adequately in exploring new objects? Is tactual discrimination adequate for beginning braille? Does the child demonstrate conceptual understanding congruent with potential classmates? Of course, such questions can be answered only with respect to the requirements and characteristics of the school or classroom setting. A comprehensive psychological evaluation should include information specific to the setting in which the child currently functions or will be placed subsequently.

### *Amount of Vision*

Most legally blind children have some degree of vision. It is incumbent on the examiner to determine what materials can and cannot be seen and used functionally (Bauman, 1973). This goal may be accomplished by questioning parents and teachers, as well as the child. For tests available in braille, large print, and regular print forms, it is recommended that the examinee indicate which is the preferred mode. When oral administration is an option, such as with certain personality or interest inventories, the child may select orally over visually presented materials. It is sometimes necessary to offer a trial with the

various materials to ascertain the most appropriate assessment approach (Bateman, 1965).

In some cases, especially for infants and very young children, accurate information on visual functioning may not be available. Because visual acuity is so important to a child's development, any child with a suspected visual deficit should be referred for an ophthalmological examination. This approach also is recommended if existing reports are more than a year old, or if the child was less than 1 year old when the most recent visual acuity evaluation was conducted. If direct observation or parent report indicates any of the following, a visual deficit is likely (Hansen, Young, & Ulrey, 1982): (1) failure to focus on, or to follow, a human face; (2) failure to blink, squint, or show pupil constriction to bright light; (3) failure to follow a light by 1 month of age; (4) failure to fixate on and follow an object by 2 months of age; (5) failure to exhibit visually directed reach by 4 months of age; (6) misalignment of eyes (turning in or out); or (7) squinting, rubbing eyes, or complaining of headaches.

### *Developmental Considerations*

Knowledge of the impact of a visual disorder across areas of development is a prerequisite to an appropriate interpretation of test results. An extensive review of these effects is beyond the scope of this chapter. (The interested reader is referred to Fraiberg, 1977; Langley, 1979; and Warren, 1977). However, a brief overview of the effects of severe visual disorder on major developmental areas is provided below.

#### *Motor Development*

Visually handicapped children's prehension and motor skills have been studied extensively by Fraiberg and her colleagues (e.g., Adelson & Fraiberg 1974; Fraiberg, 1977). Although their hands must eventually become a major perceptual organ, many visually handicapped children demonstrate more significant delays in functional hand usage (e.g., fingering, grasping, and transferring objects) than in any other developmental area. Not until 10–12 months does the visually handicapped infant begin to reach for objects based on auditory cues alone. Until this occurs, the child is severely limited in learning about the environment. Crawling in the visually handicapped infant is usually achieved by 13 months, followed by independent walking at 19 months (Adelson & Fraiberg, 1974). In comparison, most nonhandicapped children attain these milestones by 7 and 11 months, respectively.

#### *Language Development*

Although visually handicapped children may babble and imitate words sooner than sighted children, they often show delays when combining words to make their wants known (Fraiberg, 1977). It is not uncommon for young blind children to obtain higher expressive than receptive language scores on language

scales. Echolalic tendencies and strengths in retrieving stored rote facts contribute to the inflated expressive scores. Although they can recall digit series and complete familiar analogies, visually handicapped children have difficulty in following two- and three-stage commands, in understanding space and number concepts and plurality, and in discriminating objects described with two variables (e.g., big and square) (Langley, 1979).

"Verbalisms" are frequently noted in the language of the visually handicapped child (Hansen *et al.*, 1982). The term *verbalism* was coined by Cutsforth (1932) to describe the use of visual vocabulary by visually handicapped children. These children may accurately use words and describe concepts without the requisite visual experience to understand concrete, functional meanings.

### *Social Development*

A number of deficits and delays in this area are common in visually handicapped infants and toddlers. For example, the smile in the sighted infant is one of the first signs of parent-child attachment. Further, normal attachment has been associated with adequate socialization in later years (Matas, Arend, & Stroufe, 1978). However, smiling is less frequent and more muted in visually handicapped infants. Moreover, smiles may diminish with time, possibly as a result of lack of visual reinforcement or imitation of the mother's smile (Freedman, 1964). In addition, because they may remain quiet and still when others approach, visually handicapped children may appear to lack affect (Langley, 1979). Other difficulties in socialization include (1) prolonged separation anxiety resulting in passivity, decreased environmental exploration, and fear of changes in daily routine; (2) failure to engage in representative play; and (3) delays in skills in self-care (e.g., feeding, dressing, and toileting).

### *Test Administration*

#### *General Considerations*

Hansen *et al.* (1982) listed six general principles to be considered when assessing a visually handicapped child. First, they recommended that the evaluation be carried out over a period of several weeks rather than in only one session. This procedure permits observation of a wide variety of behaviors.

Second, the child should be provided sufficient time to explore and adapt to the testing environment. The visually handicapped child takes much longer than a sighted peer to adjust to new sounds, smells, temperatures, and interactions with a stranger.

Third, the child should be given adequate time to become familiar with each test object before a standardization response is expected. This goal is accomplished through tactile and oral manipulation of the object(s). Such exploration may be less efficient than visual perception by a nonhandicapped child.

Fourth, the examiner should be aware of normal and dysfunctional behaviors exhibited by visually handicapped children. In particular, stereotyped re-

sponses, such as hand flapping, rocking, and eye pressing or poking, are frequently observed. As they may interfere with test administration and may affect the reliability of the obtained data, these behaviors should be noted. At the least, the presence of stereotypical responses signals that care must be taken when interpreting test results.

Fifth, the examiner must be flexible in evaluating the child. It may be more important to focus on the functional skills that the child has acquired and how he or she solves problems than on performance on tasks designed to measure the abilities of sighted children.

The sixth general principle concerns the supplemental use of systematic, direct behavioral observations, both within the assessment setting and in the child's natural environment. Such observations are considered essential in obtaining a complete picture of the child's strengths and weaknesses in all areas of functioning, as well as in the subsequent development of appropriate intervention and instructional strategies.

### *Selection of Instruments*

The selection of standardized instruments for assessing visually handicapped children presents special problems. Many of the achievement, aptitude, and personality tests require that the examinee have the visual ability to read written materials, to perceive and/or manipulate small or colored objects, and to respond on written record forms. A few tests have been developed specifically for use with the visually handicapped. Others have been adapted for use with this population through translation into braille or large print. The most common procedure, however, is for the examiner to select appropriate subtests, to informally modify test materials and content, and to alter response requirements when testing visually handicapped persons. Several authors (Bauman & Kropf, 1979; Bullard & Barraga, 1971; Langley, 1979; Scholl & Schnur, 1976; Swallow, 1981) have compiled lists of tests and subtests, along with appropriate modifications or adaptations, that are frequently used with visually handicapped individuals.

One commonly used adaptation of assessment instruments for use with the visually handicapped is reading items aloud, either in person or through an audiotape recording (Bauman, 1971b, 1973). This approach can be accomplished efficiently when items require an open-ended or a true-false response. In multiple-choice tests or certain tests of judgment, however, the person's score is likely to be reduced by difficulties inherent in remembering accurately each of several alternative answers. If such measures are frequently used, possible responses should be put into braille or large print so that repeated references to them can be made (Bauman, 1971b).

A drawback of presenting test items orally is the lack of privacy this procedure affords relative to the privacy enjoyed by the sighted person who reads the test and responds in written form. This disadvantage may be circumvented by having the examinee type or braille answers or place specially prepared tickets (one for each response) in different piles (Bauman, 1973). Of course, the

time required for an oral presentation of test items, braille answers, or sorting tickets is considerable.

As mentioned above, several more commonly used tests appear in braille and large print formats. However, only a small number of visually handicapped children read braille, and even fewer read it well. The slowness of reading braille even by the most proficient reader requires an adjustment in the standard time limits on tests for the visually handicapped. At present, the somewhat arbitrary ratios of 2.5 to 1 (Nolan, 1962) or 2 to 1 (Bauman & Kropf, 1979; Swallow, 1981) are recommended adjustment factors. Large print users also require significantly more reading time than is the standard for sighted children using regular printed tests (Swallow, 1981).

A limitation of braille, large print, and oral forms of presentation is their failure to overcome the problem of showing pictures or other diagrams. Such nonverbal content is difficult to adapt into a tactual format, and even simple representations may lose all meaning when embossed (Bauman & Kropf, 1979). Pictorial or graphic details may be lost for the large print reader (Swallow, 1981).

Other adaptations of assessment materials and procedures include adding a sound element to materials, substituting two- or three-dimensional objects for pictures, creating raised-line figures, supplying supplemental oral directions, and manually guiding the child in the exploration of stimulus items or manipulating him or her through task demands (Langley, 1979).

### *Interpretation of Test Results*

Interpretation of psychological test results is generally based on normative data indicating the performance of age-mates on the tasks used. At least two assumptions are made when a child's performance on a test or other protocol is compared to that of the normative group. First, it is assumed that the child has been exposed to testing conditions that are similar in all important aspects to the conditions in effect for the normative sample. This goal is accomplished by the standardization of test administration. Changes in standard testing conditions necessitated by the visual handicap will influence the meaning of the results. However, there is a paucity of research concerning the interpretation of individual test scores obtained under these altered conditions (Nolan, 1962; Swallow, 1981). Data indicating, for example, whether a braille version of a test measures the same constructs or predicts to the same criteria as the original version have not been secured for many popular adaptations (Bennett, 1983).

A second assumption made when a child's performance is compared to that of a normative group is that the latter includes children similar to that child on a number of relevant characteristics (e.g., age, sex, race, family, and socioeconomic status). Similarity in these characteristics is presumed to suggest similar life experiences. However, visually handicapped children are not included in these normative groups. Their life experiences have been affected by the visual disorder and a host of other factors as well. Importantly, visually handicapped children may not have had the same opportunity to learn as their sighted peers. Often, family, friends, and teachers are overprotective because of a concern



about safety, because of pity, or simply because of a desire to be helpful. The result may be inadequate self-care or mobility skills. The visually handicapped child may also fail to comprehend the importance of efficient and accurate task completion as a result of decreased performance demands by others (Bauman, 1973).

The visually handicapped child is also frequently excluded from academic (e.g., laboratory courses, industrial arts, and physical education) and extracurricular (e.g., sports, clubs, and field trips) activities that serve as important learning opportunities for sighted students. This exclusion restricts academic achievement as well as socialization. The effects of these limitations on experiences may be reflected in results on tests of specific knowledge, aptitudes, interests, and personality (Bauman, 1971a, 1973).

Finally, the psychologist must ascertain whether the visually handicapped child has had exposure to adequate learning resources (Bauman, 1973). For example, have books in braille, large print, or recorded form been available? Are these books the same ones that sighted classmates were using? Even when these materials have been provided, it is important to remember that obtaining information through braille or audiotape is a slower study procedure than print reading by sighted children. Note taking and review are especially cumbersome and time-consuming. Given this fact, it is likely that only highly motivated visually handicapped children will have adequate exposure to educational material at a level that approaches that of their nonhandicapped peers (Bauman, 1971a).

One approach to a more meaningful interpretation of assessment results may be the development of population-specific norms for the more commonly used measures (see discussions by Bateman, 1965; Bauman & Kropf, 1979; Nolan, 1962). This task is quite burdensome, however. The establishment of norms for visually handicapped individuals is extremely time-consuming and costly, as the potential population base is small, scattered, heterogeneous, and difficult to identify and define (Bauman & Kropf, 1979; Vander Kolk, 1977). Besides failing to meet the criterion of cost-efficiency, establishing separate test norms for visually handicapped children has another shortcoming. Many times an examiner's purpose in assessment is to evaluate the potential of the child in relation to the demands of a seeing world. Thus, the interpretation of assessment results must be approached with caution and must be guided by a thorough understanding of the many factors that may contribute to a visually handicapped child's performance in the assessment context as well as in the natural setting.

## INTERVIEWING

A modicum of information is available concerning the use of interviews with visually handicapped children. As discussed elsewhere (see the "Standardized Tests" section), several self-report instruments, originally developed for the sighted, have been modified for administration in an interview format. The

potential utility of interviews with visually handicapped children deserves further exploration. Indeed, investigations involving the use of this strategy with sighted children reveal that interviews often yield reliable and valid data pertaining to important areas of children's functioning (Reich, Herjanic, Welner, & Gandhi, 1982; Rutter & Graham, 1968). Given the ability of many visually handicapped children to articulate their feelings and concerns, there is no reason that such an approach should not produce relevant reports from them as well.

A number of recommendations may be offered concerning the use of interviews with visually handicapped children. First, the examiner is advised to screen the content of questions and comments for information not available to the child as a result of the visual deficit. This caution applies to both traditional and structured interviewing. Some authors have noted that many visually handicapped children respond to questions containing visual content as well as their sighted counterparts (Hansen *et al.*, 1982). They are adept at translating a language that is tied to the visual world, and they respond to visual content in an appropriate manner. Yet, as mentioned earlier, some words and concepts that these children use and describe accurately may be incompletely or idiosyncratically understood. Thus, the examiner must be careful and flexible when interviewing, taking the time to explore fully the meaning of the child's responses.

Second, input from parents pertaining to their reactions, feelings, knowledge, and behavior toward their visually handicapped child is seriously needed to ascertain the quality of the child's environment and family life. However, we are unaware of any scale or procedure that accurately measures parental attitudes and perceptions concerning their visually handicapped children. We concur with Boyd and Otos (1981), who stated:

Probably the most efficient way of acquiring such information is by interview, utilizing content structuring and proceeding in an open and flexible manner. The interview may also offer the most compassionate method of acquiring necessary information at a time when parents are vulnerable to shock and depression. The interviewer can offer understanding and support in a non-threatening way. (pp. 354-355)

Although the value of the parental interview has been underscored for several years (see Hepfinger, 1962), few reports of its use are available. In a comprehensive study by Jan *et al.* (1977), parents of visually handicapped subjects were interviewed in their homes to determine child-rearing practices, parental interests, previous counseling, medication use, and so on. Unfortunately, no additional details regarding the interview procedure were given.

Boyd and Otos (1981) stressed that two major areas need to be covered in the parent interview. First, the examiner must assess what the parents already know, or falsely believe, about blindness as a physical and/or psychological disability. What do the parents see as the limits of their child's ability to function in a seeing world? How skillful are they at anticipating the worries, fears, and frustrations that their child is likely to experience as he or she grows up with sighted peers?

Second, the examiner must determine prevailing feelings and attitudes that may influence the parents' ability to provide the consistent and supportive, yet realistic, training necessary for the optimal development of their visually handi-

capped child. Those attitudes that might preclude adequate training must also be ascertained. In particular, are the parents demanding, or as is more frequently the case, are they overprotective of their child? If possible, the attitudes of both parents should be evaluated. When parents have disparate beliefs about child rearing, especially with regard to their expectations of the child, both the child and other family members may suffer the effects of inconsistent training and disputes concerning issues of child care. Children in general and handicapped children in particular can ill afford such family conflict.

Bauman (1972) has noted a third area to be examined through parent interviews. Because opportunities for learning affect performance on tests of aptitude, achievement, interest, and personality, the extent to which the family and the community have provided normal learning experiences for the visually handicapped child needs to be determined. Descriptions by the parents of their efforts to introduce new materials and experiences to their child and of the child's preschool or classroom routine are helpful in this regard.

A final topic deserving attention is the reason for referral and the hopes and expectations for outcome. Are the parents seeking confirmation of opinions already formulated? Or are they likely to be open and accepting of evaluation results and recommendations for the future? Too often, the parents of handicapped children have developed strong opinions and plans of action. They may have scheduled psychological evaluation only at the insistence of the school district or some other training agency, or to arm themselves with another tool to help achieve their own placement goals. Careful interviewing of parents will allow a determination of their motivation and purpose for seeking assessment of their child. This approach will help to ensure that the results of the psychological evaluation will be used in the best interest of the child client.

## STANDARDIZED TESTS

### *Intellectual Assessment*

#### *Binet Adaptations*

Four adaptations of the Binet are important in the history of testing the visually handicapped. First, Irwin (1914) omitted those items requiring vision from the Binet-Simon when assessing children with visual impairments. This adaptation is frequently referred to as the Irwin-Binet. Later, Hayes (1929) proceeded in a similar manner with Terman's revision of the Binet scale to evaluate blind children. This procedure, referred to as the Hayes-Binet, was updated in 1943 (Hayes, 1943) and resulted in the Interim Hayes-Binet Intelligence Tests. The construction of the Interim Hayes-Binet involved the selection of verbal items from the earlier Hayes adaptation and from Forms L and M of the Stanford-Binet Intelligence Scales. The author reported a test-retest reliability coefficient of .90 and a correlation of .83 with the Wechsler-Bellevue Verbal Scale (Hayes, 1950). The Interim Hayes-Binet was widely accepted and used until

recently, although it has several deficiencies, including a dependence on normative data derived from sighted subjects (Morse, 1971), the absence of nonverbal materials (Morse, 1971), and a failure to be updated over the years (Boyd & Otos, 1981).

A new revision, consisting primarily of items selected and adapted from earlier forms and called the Perkins-Binet (Davis, 1980), was developed to overcome these deficits. The Perkins-Binet tests provide separate forms and norms for children with usable vision (Form U) and no usable vision (Form N). Approximately 25% of the items in Form U and over 30% of the items in Form N are performance-type items (i.e., items perceived via tactual versus auditory modes). Preliminary investigations of reliability and validity of the Perkins-Binet have shown acceptable split-half reliability coefficients on a prepublication research version (Coveny, 1972). Also, high correlations with the Verbal scales of the Wechsler Intelligence Scale for Children—Revised have been found (Teare & Thompson, 1982). Although the Perkins-Binet appears to be an important addition to the tests for the visually handicapped, several problems in administration and scoring (Ward & Genshaft, 1982, 1983) and the need for a further determination of psychometric properties (Teare & Thompson, 1982) remain.

### *Wechsler Scales*

The Wechsler scales have been available since 1950 and are generally accepted as useful for both visually handicapped and sighted children, as they provide separate verbal and performance subtests and corresponding verbal and performance IQs. Indeed, a study by Bauman and Kropf (1979) indicated that the test most frequently used with visually handicapped clients of all ages by psychologists in the United States and Canada was some form of the Wechsler test. In a large number of cases, only the Verbal Scale was administered. However, many psychologists also used the Performance Scale when the client had useful vision. The Wechsler Intelligence Scale for Children (WISC; Wechsler, 1949), the Wechsler Adult Intelligence Scale (WAIS; Wechsler, 1955), and their respective revisions (Wechsler, 1974, 1981) are more adaptable for use with visually handicapped clients than the more recently developed Wechsler Preschool and Primary Scale of Intelligence (WPPSI; Wechsler, 1967), which has an unusually large number of items requiring vision. Furthermore, this instrument intersperses verbal and performance subtests (Bauman, 1973; Bauman & Kropf, 1979). The effects on verbal or performance IQ scores of failing to follow this format are unknown.

Although verbal subtests of the Wechsler scales require a minimum of modification, Bauman (1973) suggested that some items may be rephrased when they appear to be unsuitable for the child (e.g., the item "What should you do if you see a train approaching a broken track?" may be restated as "What should a person do if he or she sees a train approaching a broken track?"). However, even if such items are not rephrased, few visually handicapped children have difficulty with them, as most are aware that the question is hypothetical (Bauman, 1973). Further, visual bias may not be easily discernible. Researchers have found

visually handicapped children to give better answers on the train-track item than sighted children, whereas they give inadequate answers to "How many pennies in a nickel?" and "How many things in a dozen?" Where instructions indicate that arithmetic items should be read by the examinee, these can be provided in braille or large print or read aloud.

The WISC Verbal Scale consists of six subtests: Information, Similarities, Arithmetic, Vocabulary, Comprehension, and Digit Span. The performance of normally sighted children is typically consistent across all subtests. Large discrepancies are often interpreted in terms of learning disabilities, emotional problems, environmental deprivation, and so on. In contrast, research has indicated that variability in subtest scores is the rule in the case of visually handicapped children (Tillman, 1967a,b; Tillman & Osborne, 1969). These children perform best on the Digit Span and Information subtests, a finding suggesting well-developed rote-memory capacities and general knowledge. Lower scores on Similarities and Comprehension reflect less adequate conceptual thinking abilities and social judgment. Because of greater scatter for the visually handicapped, subtest pattern analysis may have limited value (Hopkins & McGuire, 1966), although this point has been debated (Spungin & Swallow, 1975). Depending on the purpose of the assessment, the Verbal Scale IQ may not provide as adequate a measure as some of the individual subtest scores (Sattler, 1982).

Given their widespread application, it is surprising to find a paucity of literature concerning the reliability and validity of the Wechsler scales for visually handicapped children. Investigations of the WISC Verbal Scale show satisfactory reliability (Tillman, 1973). However, much less is known about its validity. The WISC Verbal Scale and the Hayes-Binet have been compared in use on various samples of visually handicapped children. In one study (Hopkins & McGuire, 1966; see also a replication study by Hopkins & McGuire, 1967), the two scales were found to be highly correlated ( $r = .86$ ). However, WISC IQs were consistently lower than Binet IQs (means of 110 and 118, respectively). This issue is far from resolved, as other researchers have found WISC and Binet IQs to be highly comparable (Gilbert & Rubin, 1965; Lewis, 1957). Both the WISC and the Binet tests have shown moderate correlations with academic achievement as measured by teacher ratings (Denton, 1954), grades (Lewis, 1957), and achievement test scores (Hecht & Newland, 1965). Additional work is needed to address the prediction of academic achievement in visually handicapped children (Goldman, 1970).

Further limitations of the Wechsler scales as they are typically used with the visually handicapped are the absence of any performance items (an issue that is addressed below) and the lack of norms for visually handicapped individuals.

### *Other Intelligence Tests*

A number of other verbal tests of intellectual functioning have been developed or adapted for use with visually handicapped children with varying degrees of success. These efforts have included both individual (e.g., the Slosson Intelligence Test for Children and Adults—Hammill, Crandel, & Colarusso,

1970) and group (e.g., Otis Classification Test, Part II—Sargent, 1931) tests. Although a complete review of this literature is beyond the scope of this chapter, the reader is referred to Bauman and Kropf (1979), Bullard and Barraga (1971), Langley (1979), and Swallow (1981) for a listing of these instruments. In addition, Scholl and Schnur (1976) provided bibliographies of research related to their application.

Fewer nonverbal tests of intellectual functioning are available. Several authors have lamented this fact because nonverbal tests potentially yield interesting and important information regarding the abilities of a visually handicapped child, who either may use “verbalisms” or may have suffered educational deprivation. In these cases, verbal IQ scores may be inflated or deflated relative to true functioning levels (Bauman, 1971, 1973; Dauterman, Shapiro, & Suinn, 1967; Goldman, 1970).

Nonverbal intelligence testing of visually handicapped persons was initiated with Bauman’s Non-Language Learning Test in the 1940s (Bauman, 1971b, 1973; Dauterman *et al.*, 1967; Goldman, 1970). This device consists of a small formboard and blocks shaped so that they will fit into recesses in the formboard only when placed in certain combinations. Problem solving and learning are observed as patterns and are copied by the examinee. Other nonverbal tests include tactual adaptations of the WAIS Performance Scale (known as the Haptic Intelligence Scale for the Adult Blind—Schurrager, 1961; Schurrager & Schurrager, 1964); the Kohs Block Design Test (also called the Ohwaki-Kohs or Stanford-Kohs—Suinn, Dauterman, & Shapiro, 1966); and Raven’s Progressive Matrices (known as the Tactual Progressive Matrices—Rich & Anderson, 1965). Newland (1979) also constructed a test of nonverbal intelligence. The Blind Learning Aptitude Test uses molded plastic three-dimensional sheets and requires the examinee to identify the next element in a pattern of differences, similarities, progressions, and so on. Unfortunately, of the above-mentioned performance measures, only the Tactual Progressive Matrices and the Blind Learning Aptitude Test provide norms for children under 16 years old. Moreover, the administration of these tests is complicated by cumbersome materials, failure to provide sufficient numbers of easy or hard items, and the inordinate amount of time required for administration (one to two hours) (Bauman, 1971a; Dauterman *et al.*, 1967). In most cases, nonavailability of norms for persons with usable versus no usable vision complicates interpretation of the results (Dauterman *et al.*, 1967; Morse, 1971). Finally, moderate correlation of test scores with verbal tests and educational levels raise questions about what they measure (Dauterman *et al.*, 1967).

### *Educational Assessment*

Educational achievement was one of the earliest areas of concern in the evaluation of visually handicapped children. The initial use of achievement tests with this population dates back to 1918, when such materials as the Gray Oral Reading Check Tests, the Metropolitan Achievements Tests, the Myers-Ruch High School Progress Test, and several editions of the Stanford Achievement

Tests were adapted for the visually handicapped (Bauman, 1971a, 1973). Other achievement tests include the Sequential Tests of Educational Progress, the Cooperative School and College Ability Tests, the Diagnostic Reading Tests, the Wide Range Achievement Test, and the Iowa Tests of Basic Skills (Scholl & Schnur, 1976). Considerable effort has been expended in developing braille and large-print adaptations of the Stanford Achievement Tests and the Sequential Tests of Educational Progress (Trismen, 1967). Consequently, there is every reason to believe that these instruments can be used with some confidence. However, the time required for the administration of adapted achievement tests is far greater than the time required for the regular print versions with normally seeing children. Further, the equivalence of content and the procedures of administration for adapted and nonadapted forms of the tests are usually assumed, not empirically demonstrated. Nolan (1962) provided an excellent discussion of the problems of adapting such standard tests for use with visually handicapped children.

Arrangements can also be made for administration of the Scholastic Aptitude Test, the Graduate Record Examination, and other tests required for admission to graduate-level programs to visually handicapped high-school and college students. The presentation is in braille or is oral, and the answers are typed. The College Entrance Examination Board and the Educational Testing Service administer and score these tests under the same strict control applied to sighted students. Generally, extended time periods are allowed to give the visually handicapped respondent ample time to complete the tests. Studies of the effect of this modification on predictive value have yet to be conducted (Bauman, 1971a,b, 1973). However, the results are treated as the equivalent of scores resulting from the regular printed version of the test (Bauman, 1973).

### *Social Competency Assessment*

Bauman (1971a, 1973) has argued that tests of social competence are integral to the assessment of a visually handicapped client. As stated earlier, deficits in this area are due, in part, to the person's lack of social experience, her or his inability to learn social behavior by direct visual observation, and the failure of parents or others to encourage independence or to provide reinforcement contingent on adequate social performance. Consequently, many visually handicapped children are socially isolated (e.g., Eaglestein, 1975) and evince serious problems in social adaptation (Van Hasselt, 1983).

Several social competency scales have been developed to assess the level of social functioning in this population. One of these is the Maxfield-Buchholz Scale of Social Maturity for Pre-School Blind Children (Maxfield & Buchholz, 1958). This instrument is an adaptation of the Vineland Social Maturity Scale (Doll, 1953) and is used for screening social maturity in visually handicapped children in the 0 to 72-month age range. The Maxfield-Buchholz scale evaluates children in such areas as dressing, feeding, locomotion, motor development, communication, and socialization. Scale items at the 0-1 age level tap physical development (e.g., rolling over, balancing the head, reaching for objects, and

grasping with thumb and finger). Items at higher age levels pertain to such skills as self-care, dressing, play, and adjustment to group situations.

The Overbrook Social Competency Scale (Bauman, 1972, 1973) is an upward extension of the Maxfield-Buchholz. It begins at age 6 (where the latter measure ends) and continues through the high school period. Items on the Overbrook Scale evaluate mobility skill as well as social problem-solving.

Some characteristics are shared by the aforementioned instruments. First, they are typically completed by an informant (e.g., a parent, a teacher, or a counselor) who has considerable contact with the child. Second, most scales of this type, particularly variants of the original Vineland, yield a summative score known as a social quotient (SQ) of social competence relative to normative data on maturity level. Several investigations have used these measures to compare visually handicapped children to sighted norms (e.g., McGuinness, 1970; McKay, 1936). Samples of totally blind and partially sighted children have also been compared (Maxfield & Fjeld, 1942). The results of these studies show essentially that visually handicapped children display deficits in social competence relative to sighted norms, and that totally blind children receive lower social maturity scores than partially sighted counterparts (see review by Van Hasselt, 1983).

Ammerman, Van Hasselt, and Hersen (1985) pointed out several problems inherent in the use of these global social-competency scales. First, variants of the Vineland for the visually handicapped have questionable psychometric properties. For example, with regard to validity, the relationship between SQ and specific aspects of social functioning, such as interaction with peers or adults, has yet to be documented empirically. Second, most investigations using these measures have included heterogeneous subject populations. Groups of visually handicapped children have varied considerably with respect to the extent of their vision loss, the etiology of the disorder, their age range, and the environmental setting. Third, questions have been raised concerning the normative samples used for the Vineland derivatives. Bauman (1973) pointed out that 60% of the normative sample for the Maxfield-Buchholz scale consists of RLF (retrolental fibroplasia) children. Fourth, the finding that social maturity differs as a function of setting or environment (McGuinness, 1970) precludes the drawing of any definitive conclusions about visually handicapped children as a whole. Finally, the use of global summative scores (SQ) does not permit the identification of specific interpersonal skill deficits. Such information, which is necessary for a subsequent formulation of efficacious interventions, requires finer-grained analyses of social functioning (Van Hasselt, 1983, 1987).

### *Personality Assessment*

Personality traits or factors are configurations of interpersonal style that are products of environmental and genetic determinants. Included under this rubric are elements of intrapsychic function (e.g., self-concept) as well as symptoms related to psychopathology (e.g., anxiety and depression). A number of instruments have been used to tap such dimensions in visually handicapped children



and youth. Most of these are measures originally developed for and standardized on the sighted, with adaptations in administration procedures for the visually handicapped. For example, in an early study, Petrucci (1953) administered the Benreuter Personality Inventory (BPI) to visually handicapped residential students and compared the test results to national norms developed on a sighted population. The BPI includes 125 items and provides scores on the following subscales: Neurotic Tendencies, Self-Sufficiency, Introversion-Extroversion, Dominance-Submission, Self-Confidence, and Sociability. The results showed that the visually handicapped subjects were more neurotic, introverted, and submissive and less self-sufficient and confident than sighted norms. Other personality assessment devices designed for the sighted but administered to visually handicapped samples include the California Personality Inventory (Hastings, 1947; Joffe & Bast, 1978), the Junior Maudsley Personality Inventory (Zahran, 1965), and the Clark-Thurstone Personality Schedule (Brown, 1939).

An instrument developed specifically for the visually handicapped is the Anxiety Scale for the Blind (ASB) (Hardy, 1968). The 78 true-false items on this inventory were screened by clinical experts and were standardized on 122 adolescents and young adults (aged 13–22). The subjects had a wide range of IQ scores and vision loss. The relationships of ASB scores to teacher ratings and Taylor Manifest Anxiety Scale (TMAS) scores were examined. The correlations were low with teacher ratings ( $r = .20$  to  $.30$ ) but were acceptable with the TMAS ( $r = .60$  to  $.79$ ) between subject subgroups.

Bauman (1971a, 1973) has described the development of the Emotional Factors Inventory (EFI) and the Adolescent Emotional Factors Inventory (AEFI). The items for these tests were derived directly from experiences reported by visually handicapped persons. They comprise a series of subscales that tap social competency, sensitivity, somatic symptoms, depression, attitudes of distrust, and attitudes regarding blindness. The AEFI also includes a measure of adjustment specific to school, family, and social relationships. Bauman (1973) recommended that these tests be used with youth over age 13 and that administration be via audiotape or large print to ensure privacy in making responses. Normative data for visually handicapped individuals are available for both the EFI and the AEFI.

### *Vocational and Interest Inventories*

Dexterity tests are widely used with visually handicapped adolescents and adults. The most popular of these are the Crawford Small Parts Dexterity Test, the Minnesota Rate of Manipulation Test, and the Pennsylvania Bi-Manual Worksample. Norms are available on these measures for the totally blind and the partially sighted (Bauman & Kropf, 1979). Essentially, these instruments measure manipulative skills, such as placing pegs in pegboards, twisting nuts and bolts together, using a tweezer to pick up small objects, and using a screwdriver with small screws. As a wide range of jobs are currently open to visually handicapped persons, the assessment of manipulative skills *per se* may not be as important as it was previously. However, dexterity tests can provide more infor-

mation than the mere measure of manual speed. These tasks permit the examiner to see the client in action and to assess learning, orientation, attention, and motivation in the workspace (Bauman, 1971a, 1973).

Vocational assessment must include a determination of what the individual likes to do in addition to what he or she does well. Thus, a wide variety of interest inventories are used with the visually handicapped, usually via oral presentation. The Strong-Campbell Vocational Interest Blank and the Kuder Preference Record are frequently used (Bauman & Kropf, 1979). These tests are most applicable to high-school graduates considering professional or semi-professional goals, although some scales may be relevant below that level.

## BEHAVIORAL APPROACHES

With regard to the evaluation of visually handicapped children and youth, behavioral assessment is in the nascent stage at this time. Although many investigators have used some form of observational method to evaluate rates of problem behaviors, these efforts generally involve visually handicapped individuals suffering from multiple impairments (e.g., blind and mentally retarded or deaf and blind). Further, unique aspects of the visual handicap or the concomitant disabilities and their implications for behavioral assessment are rarely considered. For example, in our experience, many visually handicapped children seem to be particularly reactive (i.e., the frequency or quality of their behavior changes with their awareness of being observed) to observations in naturalistic and analogue contexts. We typically allow several adaptation or practice sessions before the data are considered usable. For the inexperienced examiner, reactivity in the visually handicapped would not seem to be a large problem. However, as mentioned earlier, most of these children have some degree of vision. Even in those with only light perception, the ability to discriminate novel stimuli in the environment (e.g., the presence of behavioral observers) may be surprisingly well developed.

Few behavioral assessment methods have been developed specifically for use with visually handicapped children and youth. With the exception of recent social skills assessment methods (see below), many approaches involve the use of instruments developed for the sighted and adapted for the visually handicapped (Van Hasselt, 1983, 1987). The behavioral strategies used with this group fall into the categories of self-report, role-play tests, and direct observations of behavior. These are described below.

### *Self-Report*

The Child Behavior Checklist Youth Self-Report Form (YSRF; Achenbach & Edelbrock, 1983) has been administered to visually handicapped adolescents to assess their psychological and social adjustment (Van Hasselt, Hersen, *et al.*, 1986). This measure was originally designed to obtain data regarding competen-

cies and problems in normally developing children and adolescents (ages 11–18). The YSRF includes 112 items that are rated by the child on a 3-point scale for degree of severity or frequency. Although the behavior problem scales are still under evaluation, Van Hasselt, Hersen, *et al.* (1986) selected a total problem-behavior score across all items, as well as three social competence scales: Social Activities, Social Relations, and School Performance. These investigators compared the following groups on the YSRF: visually handicapped adolescents in a residential school, mainstreamed visually handicapped adolescents in public schools, and sighted adolescents in public schools. The results of the YSRF assessment indicated that visually handicapped residential students rated themselves higher on total behavior problems than the visually handicapped public-school students, who, in turn, rated themselves higher than their sighted peers.

Citing the need for more “empirically based evaluations” of social skills deficits in visually handicapped children, Matson, Heinze, Helsel, Kapperman, and Rotatori (in press) examined the psychometric properties of the Matson Evaluation of Social Skills with Youngsters (MESSY) with this population. The MESSY is a social skills assessment scale in Likert format. It includes both a self-report and a teacher-report version, which consist of 62 and 64 items, respectively (Matson, Rotatori, & Helsel, 1983). Examples of the self-report items include “I make other people laugh,” “I feel good if I help someone,” and “I like to be alone.” The instrument was adapted for administration to the visually handicapped by providing information in large print and on audio cassettes. In their study, Matson *et al.* (in press) evaluated 75 visually handicapped subjects (aged 9–22) on the MESSY self-report and teacher-report scales. The results showed internal reliability on Gottman split-half and Spearman-Brown to be .78 or higher on both forms.

### *Role-Play Tests*

In response to the need for finer-grained analyses of social functioning in visually handicapped children, Van Hasselt, Kazdin, Hersen, Simon, and Mastantuono (1985) constructed a role-play test that (1) had adequate psychometric properties; (2) included items relevant to the visually handicapped child’s social environment; and (3) permitted a more molecular analysis of social behavior than previously used instruments. To accomplish this, they used the behavior-analytic model of test construction (Goldfried & D’Zurilla, 1969). This procedure includes a series of stages of test development (e.g., situational analysis, response enumeration, and response evaluation) that, when followed, produce a parametrically suitable tool for assessing levels of interpersonal competence. Through this strategy, Van Hasselt *et al.* (1985) developed a role-play test consisting of 39 items that tap conversational and negative assertion skills in visually handicapped children and adolescents. Conversational role-play scenes were designed to evaluate the interactions necessary for initiating a conversation and making friends. These items enabled the child to initiate and engage in prolonged (one-minute) interchanges with a role-play partner (a confederate). An example of a conversational skill scenario is provided here:

Narrator: You are walking toward a classroom. The door is partially open, and a small group of people is gathered in front of the door. You are new in class and don't know anyone. You would really like to get to know them. You hear or notice one of them walking over to you.

To assess the level of negative assertion skill, scenes similar to the following were used:

Narrator: A classmate is playing his or her radio during class time. You find this distracting and are unable to work effectively. He or she says:

Prompt 1: Listen to this song, it's a new one on the radio. (*Subject's Response 1*)

Prompt 2: It will only last a few minutes. (*Subject's Response 2*)

The participants' responses to both types of role-play scenarios are videotaped and rated retrospectively on a number of behavioral components implicated as requisite to interpersonal effectiveness in the social skill and vision literatures (e.g., Bonfanti, 1979; Eisler, Hersen, Miller, & Blanchard, 1975; Rardon, Hersen, Bellack, & Foley, 1979; Sanders & Goldberg, 1977). Some of these are speech disturbances, response latency, requests for new behavior, open-ended questions, smiles, posture, direction of gaze (eye contact), and stereotypical behaviors. Van Hasselt, Kazdin, *et al.* (1985) found that the role-play test discriminated between samples of visually handicapped and sighted children on several of these components. Van Hasselt *et al.* (1983) also used a subset of these items as a vehicle for assessment and training to improve assertiveness skills in visually handicapped adolescents.

### *Direct Observation*

A number of investigations have used direct observation methods to assess a wide range of behaviors in visually handicapped children. Most of these efforts have involved some variation of time-sampling procedures to determine the frequency or the occurrence of maladaptive responses, such as self-injury (e.g., eye poking or head banging), self-stimulation (e.g., rocking, head rolling, or finger flicking), and aggression toward others. (For a complete review of behavioral assessment and treatment approaches with visually handicapped children, see Van Hasselt, 1987). For example, Conley and Wolery (1980) observed the frequency of eye gouging in a 7-year-old mentally retarded, visually handicapped female. A series of 15-minute observation sessions was carried out throughout the day by a classroom aide who recorded the occurrence of the behavior over successive 10-second intervals. One of the experimenters also periodically collected data for the assessment of interrater agreement. These observations indicated a dramatic decrease in the frequency of the target behaviors as a function of treatment (positive practice overcorrection).

Direct observations conducted by Harris and Romanczyk (1976) revealed two categories of self-injurious behavior (head and chin banging) in an 8-year-old mentally retarded male with severe visual and hearing impairments. Al-

though specific details regarding the assessment procedure were not provided, data regarding the frequency of these self-injurious responses were collected throughout the day at school and at home by staff and parents, respectively. A reduced rate of self-injurious behaviors was noted in both settings with the implementation of overcorrection.

A unique approach to direct observation was reported by Drabman, Ross, Lynd, and Cordua (1978). These investigators used mentally retarded children as behavioral observers, mediators, and generalization programmers to reduce shirt- and finger-sucking or -chewing behavior in a 2½-year-old mentally retarded, visually handicapped male. The assessment aspects of this study involved training a 15-year-old mentally retarded male (IQ of 34) in the use of a time-sampling observation procedure. The youth learned to record the occurrence of the target behaviors at 15-second intervals for a period of up to 30 minutes (120 continuous time-samples). Concurrent observation data obtained by an experimental assistant indicated acceptable levels of interrater agreement (range of 71%–92%) over various phases of the study.

Although several professionals working with the visually handicapped have commented on the need for an assessment of parent–child interactions (Boyd & Otos, 1981; Jan *et al.*, 1977), no empirical data in this area can be found. Currently, Van Hasselt, Hersen, Moore, and Simon (1986) are developing a methodology for such assessments. Specifically, these investigators are conducting laboratory observations of visually handicapped children and their parents engaged in problem-solving discussions. These discussions concern perceived areas of needed change within the family system as reported by family members. Discussion periods are held separately for each of four family combinations: mother–father, father–child, mother–child, and mother–father–child. They are based on selected items from the Area of Change Questionnaire (Weiss, 1980; Weiss & Margolin, 1977) completed by each family member before involvement in interactions. The discussions are videotaped and rated retrospectively by means of the Marital Interaction Coding System (MICS; Hops, Wills, Patterson, & Weiss, 1972) to tap the ability of the interactants to negotiate resolutions to marital and family problems. The MICS consists of 30 verbal and nonverbal categories that can be condensed into the larger summative domains of Effective Problem-Solving, Ineffective Problem-Solving, Positive Social Reinforcement, and Negative Social Reinforcement. It is expected that the effort by Van Hasselt, Hersen, *et al.* (1986) will yield a useful methodology for the assessment of interactions involving visually handicapped children and their families, as well as important data concerning both the deficits and the strengths of these family systems.

## SUMMARY

Some visually handicapped children may exhibit problems in cognitive, social, and emotional and behavioral functioning. Assessment of deficiencies and strengths in these areas is essential to research and intervention with this

population. However, the unique limitations inherent in the visual deficit present difficulties in conducting psychological assessment. Typically, the instruments and strategies devised for normally developing sighted children are used with visually handicapped children. However, modifications and adaptations of traditional assessment techniques are often necessary. The purpose of this chapter was to describe approaches and issues pertaining to the evaluation of visually handicapped children.

As with other handicapped groups, comprehensive assessment, including interviews, standardized tests, and behavioral assessment (self-report, analogue tasks, direct observation), is necessary to address the special needs of visually handicapped children. Further, many adaptations in instrumentation may be required to accommodate these individuals. Some of these are screening the content of items for visual material, presenting test items in braille or large print, and careful interpretation of test results (particularly with those instruments lacking normative data or well-documented psychometric properties). Unfortunately, the available literature in this field does not provide adequate information regarding how modifications of traditional procedures affect the results obtained and their predictive value. Also, few assessment devices have been specifically designed for visually handicapped children. Moreover, there is a paucity of data attesting to adequate parametric properties of most instruments used with this population. Clearly, empirical research is needed to target these important issues. Until such investigations are carried out, psychologists must be (1) cautious in their selection of suitable measures for assessment and (2) careful to administer assessment techniques in a way that is relevant to the needs of their visually handicapped clients. Last, but hardly least, it is incumbent on the examiner to interpret any results in the light of current knowledge about the impact of severe vision loss on development, as well as the effects of the handicapped child's environment on her or his acquisition of academic and adaptive skills.

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# 24 *Physical Handicaps*

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## INTRODUCTION

Physically handicapped children are a diverse group. Limitations in a child's physical capabilities may be apparent at birth or may be diagnosed several years later. Physical disabilities may be due to inborn characteristics or may develop in a normal child following illness or accident. Physical handicaps may be stable or progressive, mild or severe, visible or invisible.

Medical advances have contributed to the early identification and prevention of some physical disabilities. They have also permitted the survival of greater numbers of physically handicapped children. Psychological study is now possible with groups of children not previously examined or followed over time. However, such study is complicated by the heterogeneity of the medical conditions of these children.

Psychologists have expressed concern about the appropriate methods and instruments for assessing the cognitive abilities of physically handicapped children for over 40 years. More recently, the accurate assessment of physically handicapped children has received greater emphasis following legislation requiring public education for all handicapped children.

There has been a continuing interest in the emotional impact that a physical disability can have on a child. Efforts are being made to develop methods of identifying and preventing emotional disturbance in groups of high-risk children, including the physically handicapped.

In this chapter, we focus on four types of physical disabilities: cerebral palsy, spina bifida, Duchenne muscular dystrophy, and speech disorders. These are among the most studied groups of physically disabled children. They represent distinct syndromes, and each has some unique characteristics. Each section begins with a description of the disorder and some relevant information pertaining to its incidence, its etiology, and its physical characteristics. A selected literature review follows on the assessment of the child based on interviews, standardized tests, and behavioral approaches. The chapter concludes with summary statements and issues for further consideration.

## CEREBRAL PALSY

### *Population Defined*

The term *cerebral palsy* refers to "any disorder of movement and posture that is attributed to a nonprogressive brain abnormality of the immature brain" (Batshaw & Perret, 1981, p. 191). Cerebral palsy is a generic term that is applied to a group of movement disorders that vary in etiology, severity, and topography. Table 1 summarizes the classification types of cerebral palsy according to clinical signs. Cerebral palsy has also been classified according to the location of limb involvement. For example, *hemiplegia* refers to a movement disorder affecting one side of the body, *paraplegia* refers to lower limb involvement, *diplegia* refers to legs more affected than arms, and *quadriplegia* to the involvement of all four limbs (Minear, 1956).

Surveys estimate the incidence of cerebral palsy to be from 1 to 5 in 1,000 (Cruickshank, 1976), with a fairly equal distribution by sex. Approximately 50% of cerebral-palsied children are moderately or severely affected, and 25% are mildly or very severely affected (United Cerebral Palsy, 1982).

The etiology of cerebral palsy syndromes includes prenatal, perinatal, and postnatal factors. Prenatal factors account for about one-third of the cases and include anoxia, infections, Rh incompatibility, metabolic disturbances, and hereditary or genetic conditions (Allen & Jefferson, 1962). Perinatal causes of cerebral palsy include prematurity, anoxia, and mechanical injury to the brain. Prematurity is the most commonly identified etiological factor, occurring in approximately one-third of all diagnosed cases (Bleck, 1982). Postnatal factors are identified in about 10% of the cases and include meningitis, encephalitis, environmental toxins, and head trauma (Blair & Stanley, 1982). In many instances, no cause is identified, or multiple high-risk factors are presumed to contribute (O'Reilly & Walentynowicz, 1981).

TABLE 1. Classification of Cerebral Palsy

Type	Presumed site of lesion	Movement characteristics
Spasticity	Descending pyramidal tract or premotor cortex	Increased muscle tone and exaggerated reflexes
Athetosis	Extrapyramidal system, globus pallidus	Involuntary muscle activity, stumbling gait
Rigidity	Not known	Hypertonicity of muscles
Tremor	Basal ganglia	Involuntary, reciprocal motions
Ataxia	Cerebellum	Disturbance of balance and equilibrium
Mixed	Multiple	Most common is spastic-athetoid

Note. Adapted from Marks (1974).

### *Special Considerations*

Although the distinguishing features of cerebral palsy are movement and posture disorders, it has been described as "a symposium of handicaps" (Robinson, 1973, p. 309). Cognitive, emotional, neuromuscular, and sensory disorders are associated with cerebral palsy. Seizure disorders are diagnosed in up to 60% of cerebral-palsied children (Marks, 1974). Vision, speech, and hearing disorders are noted frequently, as well as visual-perceptual and haptic difficulties (Allen & Jefferson, 1962). In addition to the heterogeneity of physical movement handicaps in cerebral palsy, the potential combination of associated disorders complicates the assessment process. A comprehensive, multidisciplinary assessment procedure is mandatory.

Cerebral-palsied children may receive a number of medical and rehabilitative interventions. Some movement and posture disorders may be treated with orthopedic surgery. More frequently, mechanical aids are used (Denhoff, 1976; Marks, 1974). Medication is most often prescribed for the management of seizures in cerebral-palsied children. Muscle relaxants may be prescribed to assist in physical therapy, particularly if there is a spastic movement disorder (Marks, 1974).

### *Interviewing*

Both structured and unstructured interviews have been used with cerebral-palsied children and their parents; however, the specifics of the interview are often vague, control groups may be absent, and reliability and validity data are seldom gathered. Interviews with children have been conducted to assess psychopathology or to determine the child's self-perceptions. The child's physical limitations, especially speech, intellectual capacity, and age, of course, affect the viability of the interview technique. Parents have been interviewed to provide developmental histories and to determine their concerns about and expectations for the child.

Extensive research on the use of a psychiatric interview with the child has been conducted by Rutter and his colleagues (Rutter & Graham, 1968). The results obtained with the interview are discussed in conjunction with behavior rating scales.

Based on interview responses, the self-perceptions of a heterogeneous group of physically handicapped children (aged 9–11) were negative in comparison to control children (Richardson, Hastorf, & Dornbusch, 1964). In another study, handicapped children (aged 7–13) had unrealistically high levels of aspiration in comparison to control children (Harway, 1962). They also exhibited greater variability of responding, which was interpreted as evidence of greater uncertainty about their ability to achieve goals.

Interviews with the parents of handicapped children often focus on the child as a stressor that parents cope with in varying degrees of effectiveness. In two publications by Minde (Minde, Hackett, Killou, & Silver, 1972; Minde, Silver, & Killou, 1971), interviews with parents of 41 physically handicapped children (aged 5–9) were reported. Rather than describing the parental response

to the child as either acceptance or rejection, the authors proposed that the concept of "marginality" has greater relevance. According to this view, the handicapped child has a dual nature, possessing attributes that are like those of other children and attributes that are unlike those of other children. Parents deal with both the normal and the deviant aspects of the child and may emphasize one aspect or the other by behaving in an overprotective way or by denying problems.

### *Standardized Tests*

The selection and administration of standardized tests for cerebral-palsied children has been the topic of considerable debate since the 1940s. It is argued that cerebral-palsied children are unfairly penalized for their physical disabilities by tests that require physical performance (Katz, 1955a). The child's performance on the test reflects both the type and the severity of the physical handicaps as well as the child's abilities. If physical limitations are not taken into account in the selection of intelligence tests, an invalid assessment of cognitive functioning may result, leading to gross mislabeling and inaccurate prognosis (Doll, 1954). Solutions have been offered, including the selection of tests that have minimal performance demands, the development of instruments specifically designed to match the performance limitations of physically handicapped children, or the modification of existing tests. Some researchers have maintained that no special materials are necessary for testing the majority of cerebral-palsied children. According to this view, a better solution is to select tests that can be administered with the fewest alterations and to omit some tests completely (Cruickshank & Hallahan, 1976a).

Although discussion of these issues continues, a moderate position has been adopted by many assessors. The use of standardized tests is viewed as one component in the assessment process. The physical limitations of the child are taken into account in the selection of tests, there is no reliance on a single test, and a variety of response requirements are involved in a thorough evaluation (Barnett, 1982).

### *Cognitive Assessment*

Most of the research reported in the psychological literature on cerebral-palsied children has focused on cognitive assessment. Studies have indicated that approximately 50%–65% of cerebral-palsied children obtain IQs below 70 (Burgemeister & Blum, 1949; Holden, 1952). Of these, approximately 20% obtain scores below 40. The type of cerebral palsy is related to the incidence of mental retardation. Large-scale studies have reported that mental retardation is diagnosed more frequently with the ataxic and rigidity types than with the spastic and athetoid types (Bice & Cruickshank, 1966, as cited in Cruickshank & Hallahan, 1976a). Other comparisons of IQ level and cerebral palsy types have yielded conflicting results, with some reporting that athetoids are higher in IQ than spastics (Holden, 1952), whereas others find no difference between the two groups (Katz, 1955b).

Before testing a physically handicapped child, the examiner should obtain information on the child's vision, hearing, speech, sitting balance, arm-hand coordination, reading and writing skills, and ability to respond yes or no by verbal or nonverbal means (Sattler, 1974). Katz (1954) developed a convenient form that can be used to rate sensory and motor skills and degree of physical handicap.

The standardized tests most often modified for use with cerebral palsied children are the Stanford-Binet and the Wechsler Intelligence Scale for Children (WISC). (The WISC, rather than the revised WISC, or WISC-R, is discussed because the research reported was done with the WISC unless otherwise noted.) Detailed analyses of the physical abilities required to perform individual Binet items have been reported (Allen & Jefferson, 1962; Katz, 1956). The items that differentiated groups of cerebral-palsied and control children were those requiring motor coordination, drawing, and memory (Katz, 1955c). Modifications of Binet items have been suggested. Sattler and Anderson (1973) tested a multiple-choice modification of the Binet. The II-V year level compared well with the standard test, but the IX-XIII year level modifications tended to be easier than the standard form. The authors recommended that the modified test be used only when speech or motor difficulties are severe.

Adaptations of the WISC subtests for physically handicapped children have been more difficult because of the timed subtests in the Performance Scale that may severely penalize a child with motor handicaps (Harrington, 1979). Modifications of Digit Span and Block Design have been found to be comparable to the standard subtests (Sattler & Tozier, 1970). The Digit Span modification required a pointing response, and the modified Block Design required the child to instruct the examiner in design construction.

Preschool tests are used with cerebral-palsied children for placement purposes and program evaluation. The Gesell Developmental Scale is often preferred over the Cattell because it seems less affected by motor disabilities (Allen & Jefferson, 1962). The results of early testing of cerebral-palsied children has some predictive power (Fishman & Palkes, 1974; Nielsen, 1971). There is some evidence that the IQ of cerebral-palsied children may increase with age (Hirschensfang & Benton, 1965); the greatest stability is observed in groups initially scoring below 50 or above 90 (Klapper & Birch, 1966), and less stability is observed in borderline ranges or in cases of epilepsy (Nielson, 1971).

A number of nonverbal tests have been used with cerebral-palsied children, either alone or in combination with other tests. Some of the more commonly used tests are mentioned here. For information on other tests, the reader may consult Mulliken and Buckley (1983).

Picture vocabulary tests, including the Peabody Picture Vocabulary Test (Dunn, 1960) and the Ammons (Ammons & Ammons, 1948), have both been frequently used with cerebral-palsied children, who use a pointing or eye-blinking response. Both tests have been found to correlate highly with individual IQ tests (Ando, 1968; Dunn & Harley, 1959). The tests are purported to measure receptive vocabulary. Critics of the tests have noted that visual discrimination, as well as receptive vocabulary, is required (Williams & Marks, 1972). The Pictorial Test of Intelligence (French, 1964) samples a broader range of abilities than

the picture vocabulary tests. A multiple-choice format is used. The test is considered particularly useful for 3- to 6-year-olds with speech or motor handicaps (Himmelstein, 1972). The test scores have been found to be a good predictor of teacher-rated achievement (Coop, Eckel, & Stuck, 1975).

The Columbia Mental Maturity Scale (Burgemeister, Blum, & Lorge, 1972) is designed to measure general reasoning ability in children aged 3½–10. The child picks the one card out of four that does not belong. When the test was first introduced, it was acclaimed as the one to use with cerebral-palsied children. However, the test was criticized for its reliance on perceptual discrimination and repeated conceptual shifting, both of which can be difficult for cerebral-palsied children (Canter, 1956). Young children may have difficulty understanding the task instructions (Sattler, 1974).

The Raven Progressive Matrices (Raven, 1960) were first used with cerebral-palsied children by Tracht (1948). The Raven has been administered using the Etran-N response mode, which relies on eye movements (Brown & McMullen, 1982). The Leiter International Performance Scale (Leiter, 1959) has also been recommended for use with cerebral-palsied, hearing-impaired children (Allen & Jefferson, 1962). Adequate vision is required, however.

The use of the Bender-Gestalt test (Koppitz, 1964) with cerebral-palsied children has received some research attention. Evidence of perceptual-motor problems is frequently obtained (Cruikshank & Hallahan, 1976a; Patel & Bharucha, 1972). The form perception of cerebral-palsied children has also been found deficient (Berko, 1954).

### *Personality Assessment*

A summary of research on cerebral palsy published in the 1950s reported that personality studies were practically nonexistent (Holden, 1952). In comparison to the vast literature on intellectual assessment in cerebral-palsied children, the personality literature remains meager today. Much early work focused on identifying the personality characteristics of specific disability types or relating the severity of a disability to emotional adjustment. These efforts have met with little success (Richman & Harper, 1978; Shontz, 1970). The present consensus is that there is no cerebral palsy personality type (Allen & Jefferson, 1962; Freeman, 1970). The visibility of the handicap, rather than the severity *per se*, has become the focus of much personality and adjustment research (Cruikshank & Hallahan, 1976b).

Many of the early publications on the personality characteristics of cerebral-palsied children were based on clinical observation. The recent studies are data-based but may be somewhat confusing because they tend to include heterogeneous groups of physically handicapped children. There has been much less concern about the response requirements of personality tests than of intellectual tests. Adequate vision and speech are required in most instances, and arm-hand control is needed to respond to the Rorschach inquiry (Allen & Jefferson, 1962). Children of at least average IQ are generally included in the studies of personality characteristics.

Both objective and projective personality tests have been used to study



cerebral palsied children. Harper (1978) examined the MMPI profiles of physically handicapped adolescents. He reported that 75% of the subjects obtained a *t* score above 70 on one or more clinical scales. In comparison to nonhandicapped controls, the handicapped group scored higher on the *Hs*, *Sc*, and *Ma* scales. A study conducted with adults also found *Sc* and *Ma* elevations (Linde & Patterson, 1958). The authors suggested that a combination of factors contributes to high scores on the *Sc* scale, including the actual physical limitations of the handicapped person, as well as a tendency to withdraw from social contacts.

In a West German study of younger children (mean age = 12 years), a mixed group of physically handicapped children was compared to controls on the Junior Eysenck Personality Inventory and the Children's Personality Questionnaire (Steinhausen, 1981). The physically handicapped children were more introverted than the controls, and the cerebral palsy subgroup was the most introverted. Physically handicapped children were more tender-minded, scored lower on ego strength, and were more skeptical and hesitant than controls. Hemophiliac and diabetic children did not differ from controls, a finding leading the author to conclude that the visibility of the handicap influences the child's adaptation.

Developmental changes in personality and adaptation remain a somewhat unexplored area. Research on a small sample of young cerebral-palsied children (aged 4–8) found no difference in self-concept between handicapped and control groups on the Purdue Self-Concept Scale, although there was a tendency for older handicapped children (aged 6–8) to score lower than the controls (Teplin, Howard, & O'Connor, 1981). The authors suggested that the self-concept scores of the older children may reflect an increased awareness of their physical limitations. Longitudinal studies could clarify this issue.

The projective testing of cerebral-palsied children has included the use of human figures, apperception tests, and sentence completion tests. In many studies, it was hypothesized that the children's responses would reflect low self-esteem and a distorted body image (e.g., Nielsen, 1961). Abercrombie and Tyson (1966) declared that the distorted-body-image hypothesis was unnecessary. Comparison of the human figure drawings and the figure-copying performance of cerebral-palsied children indicated that drawing was generally affected by the physical disability of the child and was evident in both drawing samples. A distorted-body-image explanation is unnecessary because poor drawing ability can account for any observed deviations in human figure drawings.

### *Behavioral Approaches*

Behavioral approaches to the assessment of physically handicapped children have relied, for the most part, on the use of checklists and rating scales, with little direct observation of behavior. Frequently, researchers have adapted one of the more commonly used behavior checklists for their own purposes. The modifications that are made in the original instrument are not always clearly reported, and the effects of the changes on the reliability and validity of the scale are unknown.

Rating scales have been used by parents and teachers to provide informa-

tion on the handicapped child's level of adaptive behavior. The accuracy of parental ratings of preschool children's adaptive behavior has been of some concern to researchers. Keith and Markie (1969) found that parents and professionals disagreed on cerebral-palsied children's capabilities. In particular, the parents tended to overestimate the skill level of their child, especially the lower functioning child. However, skill ratings made by professionals did not agree with one another, either.

Research on the school adjustment of cerebral-palsied students has supported earlier findings that the physically handicapped child may be socially withdrawn and inhibited. The Quay Behavior Problem Checklist (Quay & Peterson, 1967) was completed by regular classroom teachers for 10- to 15-year-old cerebral-palsied, cleft-palate, and normal control children (Richman & Harper, 1978). The handicapped children were rated higher than the controls on the Personality Problem dimension and did not differ from them on the Conduct Problem dimension. In a second study that included older children (aged 10-18), cerebral-palsied children were rated lower than controls on the Conduct Problem dimension (Harper, Richman, & Snider, 1980). In addition, mildly impaired students were rated higher than the severely impaired on the Personality Problem dimension, a finding suggesting that the severity of a disability can be a mediating factor in the development of impulse inhibition.

The incidence of emotional disturbance in physically handicapped children is high and is related to the type of handicap, according to extensive research conducted by Rutter and his colleagues (Rutter, 1978; Seidel, Chadwick, & Rutter, 1975). In this research, handicapped children were divided into two groups: a neuroleptic group and a physically handicapped group. The neuroleptic group included children with disorders occurring above the brain stem, such as cerebral palsy, epilepsy, and hydrocephalus. The physically handicapped group included children with asthma, polio, diabetes, muscular dystrophy, and spina bifida.

The incidence of psychiatric disorders was approximately 6% in the general population of 5- to 14-year-olds, 12% in the physically handicapped group, and

TABLE 2. Types of Spina Bifida

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*Spina bifida occulta.* The vertebrae fail to fuse in the midline, but the meninges and the cord remain intact. This form of the disorder rarely produces medical symptoms and probably goes undetected in most individuals. A few children may develop foot deformities, urinary incontinence, localized sensory impairment, or pain radiating to the legs.

*Meningocele.* A lesion exists in the midline of the back through which the meninges protrude. The meninges can often be repositioned surgically with relatively minor consequences (e.g., slight limps or minor visual defects.)

*Myelomeningocele* (also known as myelocele or meningocele). The meninges and a malformed portion of the spinal cord protrude through a gap in the vertebrae and are contained in a thin, easily ruptured membrane.

*Encephalocele.* A lesion associated with a cranial closure deficit. Frequently, brain tissue is found in the sac, and repairing the lesion necessarily involves removal of parts of the brain.

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Note. Adapted from Anderson and Spain (1977), Tew (1973), and Wieczorek and Natapoff (1981).

24% in the neuroleptic group. The severity of the physical handicap and the child's IQ did not account for the incidence of psychiatric disorders. The type of psychiatric problem was not related to the child's group membership or sex, as similar patterns of symptoms were found in all groups. Among cerebral-palsied children, the presence of other neurological features such as strabismus, reading difficulties, and retarded language increased the likelihood of psychiatric problems. The high incidence of disorders in the neuroleptic group was attributed to aspects of the brain damage *per se* and to psychosocial factors.

## SPINA BIFIDA

### *Population Defined*

The term *spina bifida* is generally used to describe four distinct congenital deviations of the spine where the neural, bony, and soft tissues fail to fuse at the midline (see Table 2 ). Girls are more frequently afflicted and tend to be among the more severely disabled, mentally and physically.

The highest incidence of spina bifida is found in northern India, northern Egypt, and the United Kingdom (approximately 2.4 times in 1,000 births in the British Isles and 4.2 times in 1,000 in Ireland and Wales; Anderson & Spain, 1977; Wiczorek & Natapoff, 1981). Some prenatal screening procedures are being developed; currently, they are used only on at-risk populations because they are unreliable before Week 16 of the pregnancy (Anderson & Spain, 1977).

The public tends to associate the term *spina bifida* with the condition more precisely referred to as *myelomeningocele*. Bowel and bladder dysfunction are found in most children. Other complications depend on the level of the spinal column where the lesion occurs (see Table 3). The majority of children with myelomeningocele have lesions in the lumbar and lumbosacral regions, which are the last areas of the tube to close developmentally.

TABLE 3. Deficits and Complications in Myelomeningocele

Level of lesion	Deficits and complications
Cervical	Survivors are usually simple meningoceles; handicaps are rare.
Thoracic (above T-12)	Complete paralysis of lower extremities; good motor control of the trunk.
Lumbar (L-1-L-2)	Movement in the extremities is limited except for hip flexion, adduction, and some knee extension; require total support of the lower limbs.
(L-4-L-5)	Hip flexion, adduction, knee extension, and dorsiflexion of the ankle are present; supports are needed.
Sacral (S-1-S-2)	Extension and abduction weakness; good motor power in the hips, knees, and ankles; some toe movement; feet need support; associated with foot deformities.
(S-3-S-4)	Functionally normal in lower extremities; perianal hypoesthesia.

*Note.* Adapted from Anderson and Spain (1977); Badell-Ribera, Shulman, and Paddock (1966); and Smith (1965).

## *Special Considerations*

### *Hydrocephalus*

Approximately four out of five babies born with myelomeningocele have hydrocephalus (Anderson & Spain, 1977). In some cases, the condition does not become progressive, and adverse effects are unlikely. In more severe cases, a shunt is inserted to reduce the abnormally high pressure of the cerebrospinal fluid to a normal level and to maintain it there. The functioning of the shunt must be monitored, as malfunctioning may threaten life or permanently impair intellectual functioning. Children with spina bifida probably incur less brain damage from hydrocephalus, as they frequently receive treatment more promptly than children who develop it from other causes.

Variations in the severity of hydrocephalus have presented a problem for researchers investigating its effects. Some researchers have used the presence of a shunt as an indicator of hydrocephalus. However, in spina bifida children, a shunt, may be used as a preventive measure rather than in response to a significant problem. Alternatively, children who have an initially mild degree of hydrocephalus that has arrested spontaneously may never have a shunt. Another consideration is the possibility of brain damage secondary to infections associated with the shunt.

Squinting is a common problem in hydrocephalic children with spina bifida (Anderson & Spain, 1977). Hydrocephalus may result in weakness in the arms, impairment of manual dexterity, and poor balance. Most children with myelomeningocele and hydrocephalus are born with an abnormality of the cerebellum and other lower-brain-stem structures called the *Arnold-Chiari malformation*. The nature of the effects of this abnormality on the child's functioning is uncertain.

### *Cocktail Party Syndrome*

Taylor (1959) provided the classic description of the cocktail party syndrome, or hyperverbal behavior, which refers to an extreme form of fluent speech coupled with poor understanding and a good memory for social occurrences and auditory series. At preschool age, these children give the impression of being very intelligent, but deficits in perceptual-motor skills, judgment, reasoning, and comprehension are evident during psychological evaluations. By early adolescence, the language skills are no longer notable, although verbal patterns may be used in lieu of conversation to maintain social contact.

Some researchers have estimated that the phenomenon occurs in about 28%–40% of children with spina bifida (Diller, Paddock, Badell-Ribera, & Swinyard, 1966, as cited in Tew, 1979; Spain, 1974; Tew, 1979; Tew & Lawrence, 1972). Girls are more likely to exhibit the syndrome (Tew, 1979). It has been observed that the hyperverbal behavior tends to drop out in adolescence (Diller, Gordon, Swinyard, & Kastner, 1969, as cited in Anderson & Spain, 1977; Tew, 1979). Children with hydrocephalus are more likely to exhibit the cocktail party

syndrome (Diller *et al.*, 1966, as cited in Tew, 1979; GLC Study, in Anderson & Spain, 1977; Spain, 1974; Tew, 1979). Hypervocal children also tend to be more severely disabled (Diller *et al.*, 1969, as cited in Anderson & Spain, 1977; Tew, 1979).

### *Interviewing*

Dorner (1975, 1976) interviewed 63 families with spina bifida teenagers (ages 13–19). His sample included approximately equal numbers of mild, moderate, and severe multiple handicaps. Depressive feelings were reported in notable proportions. Definite, recurrent feelings of misery were reported by 85% of the adolescents, and 66% of the parents were aware of this problem. Only 41% of the normal 14½-year-olds in the Isle of Wight Study reported such feelings (Rutter, Graham, Chacwick, & Yule, 1976). Females were more likely to report frequent misery, although as many boys reported miserable feelings at times. Females were twice as likely as males to feel that life was not worth living. Females were three times as likely to have had suicidal feelings as the 14½-year-old girls in the Isle of Wight Study (Rutter *et al.*, 1976).

### *Standardized Tests*

Spina bifida children require ongoing outpatient care, as well as frequent hospitalizations to deal with orthopedic, urological, and neurological complications. Clinics established to serve these needs have been a rich source of information on the psychological functioning of these children. Longitudinal research efforts in these settings have generated a comprehensive picture of the development of cognitive abilities in this population. For example, the Greater London Council (GLC) study is a longitudinal study of spina bifida children in the Greater London area that began in 1967 to assess capabilities and adjustment in this population (Anderson & Spain, 1977).

A number of studies have been done on intelligence in spina bifida children (Badell-Ribera, Shulman, & Paddock, 1966; Burns, 1967; Lorber, 1971; Spain, 1972, 1974; Tew, 1973). Even when the children have been fully treated at birth, the distribution of their IQ scores tends to be skewed toward the lower end, with a peak in the low average to mildly retarded range. The mean IQs of preschool and early-school-aged children with spina bifida fall into a similar distribution (Burns, 1967; Jamison & Fee, 1978).

The studies on spina bifida children in the south of Wales (e.g., Laurence & Tew, 1967, 1971; Tew, 1973; Tew & Laurence, 1972) found that children with meningoceles are likely to fall into the normal range of intelligence. Those with myelomeningocele, which is the most commonly seen variation of the disorder, are more likely to fall in the borderline to low average range of intellectual functioning. Encephaloceles frequently have moderate to mild levels of mental retardation. Despite these tendencies, it is important to note that many children with myelomeningocele or encephalocele have average or above-average intellectual ability. It appears that spina bifida children (particularly those with

shunts and IQs less than 80) do significantly better on the Verbal Scale than on the Performance Scale of the WISC (Anderson & Spain, 1977; Connell & McConnel, 1981). However, such discrepancies in verbal and performance functioning do not occur uniformly (Laurence & Tew, 1971).

Fishman and Palkes (1974) investigated the value of preschool psychometric measures in predicting later intellectual development in children with shunts. Some of these children also had diagnoses of encephalocele, meningocele, and myelomeningocele. These authors found that performance at 18 months on the Cattell Intelligence Scale (Cattell, 1940), the Vineland Social Maturity Scale (Doll, 1965), and the Verbal Language Development Scale (Mechan, 1958) were all significantly correlated with performances at 5 years on the Stanford-Binet. Scores obtained on examinations between ages 2 and 4 were not better predictors than those obtained at 18 months. Before 18 months, the developmental quotients obtained were not reliable predictors of intellectual level at age 5.

The intelligence scores of spina bifida children apparently change very little across time, a finding indicating that, for the majority of children, very reliable predictions can be made when the child enters school about what his or her intellectual level will be at age 16 (Laurence & Tew, 1967; Tew & Laurence, 1974, 1983). However, achievement measures indicated lower levels of accomplishment than might be predicted on the basis of these IQ scores.

### *Hydrocephalus*

In general, researchers have found that spina bifida children with hydrocephalus function at a lower level intellectually than those without it (Badell-Ribera *et al.*, 1966; Jamison & Fee, 1978; Lorber, 1971; Spain, 1974; Tew & Laurence, 1975), particularly on performance scales (Jamison & Fee, 1978). In addition, Tew and Laurence (1983) noted deterioration in the IQs of hydrocephalic children following valve complications or intracranial infection requiring shunt revision.

### *Intellectual Development: Specific Skills*

The clinical literature suggests that children with spina bifida and hydrocephalus present with apparent strengths in verbal ability. Spina bifida children appear to be relatively unimpaired in vocabulary skills, although more deficits are noted in shunted children (Anderson, 1975, as cited in Anderson & Spain, 1977; Spain, 1974). Spina bifida children generally have an adequate grasp of syntax, but comprehension and ability to use language appropriately are frequently impaired (Anderson & Spain, 1977).

Poor hand function has been noted in many spina bifida patients of all ages (Parsons, 1972; Rowland, 1973; Sella, Foltz, & Shurtleff, 1966; Spain, 1970, as cited in Anderson & Spain, 1977). Spina bifida children are slow to develop clear hand preferences. This slowness may interfere with their motor development, particularly as their opportunities to develop motor skills may already be limited by their locomotor impairments. They worked more slowly and had more difficulty with tasks requiring fine finger movement, efficient release mechanisms,

and good eye–hand coordination (Anderson & Spain, 1977). Wallace (1973) found that many children with myelomeningocele exhibited signs of upper limb dysfunction, including cerebellar ataxia, mixed cerebellar ataxia, and pyramidal tract dysfunction.

Studies using the Bender-Gestalt, the Frostig, and the Beery-Buktenica Test of Visual-Motor Integration suggest that visual, motor, or visual-motor integration abilities may be markedly impaired in children with spina bifida and/or hydrocephalus (Anderson & Spain, 1977; Connell & McConnell, 1981; Miller & Sethi, 1971; Tew, 1973). Poor hand control on these paper-and-pencil measures may result in impaired performance that is unrelated to perceptual accuracy. Assessment of visual-perceptual abilities has also been complicated by the incidence of ocular deficits, such as squinting. Children with shunts had difficulty understanding and executing tasks requiring mazes, geometric designs, animal house, and arithmetic. Problems were also noted in reproducing simple designs with matchsticks, a finding suggesting that motor control is not the only issue (Anderson & Spain, 1977).

### *The Cocktail Party Syndrome*

Studies using projective tests have indicated that hyperv verbal children differ from controls on qualitative rather than quantitative measures (Diller *et al.*, 1966, as cited in Tew, 1979; Fleming, 1968). For example, on the (CAT), Fleming (1968) found that hydrocephalic children were no more verbose than controls on measures such as the total number of responses, the total number of words, and the average length of responses. However, hydrocephalic children were more likely than control children to engage in situational conversation or to make unrelated responses during the task.

Tew (1979) did a comprehensive study investigating various ways in which children with the cocktail party syndrome differ from spina bifida children who do not exhibit this syndrome. The hyperv verbal group scored in the mildly mentally retarded range on the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) and had verbal IQs that were significantly greater than performance IQs. The overall IQs of the control group were significantly higher. The GLC study (Anderson & Spain, 1977) confirmed these findings and noted that children with milder hyperv verbal features were often of normal intelligence. Tew (1979) found that hyperv verbal children tended to do more poorly than the control group on tests of adaptive skills, visual-motor ability, reading, spelling, and arithmetic. He suggested that these results may reflect the lower intellectual status of the hyperv verbal group rather than any unique characteristics. Spain (1974) concluded that hyperv verbal children had good syntax, poor comprehension, and difficulty using language creatively, based on their performance on the Reynell Developmental Language Scales.

### *Behavioral Approaches*

The GLC study mothers rated the severity of difficulties in their 3-year olds' functioning in several areas (e.g. eating, sleeping, and temper) (Anderson &

Spain, 1977). Overall, the spina bifida children did not show more disturbed functioning than a nonhandicapped sample investigated in a similar fashion (Richman, Stevenson, & Graham, 1975).

The GLC survey (Anderson & Spain, 1977) used questionnaires developed by Rutter, Tizard, and Whitmore (1970) to gather data from teachers regarding behavior in 6-year-olds with spina bifida. Spina bifida children with shunts appeared more likely to have higher scores than those without; whose total scores were comparable to those of controls. Endorsement of individual items reflects the irritability, restlessness, apathy, and lack of responsiveness noted in the observation of younger spina bifida children.

Anderson and Spain (1977) collected data on 7 to 10-year-olds with myelomeningocele and hydrocephalus using the same teacher rating scales. Only 11% scored in the behavior disorder range. Poor concentration and fearfulness were attributed to large proportions of the spina bifida group. As in the GLC study, the teachers endorsed few items that indicated antisocial or aggressive behavior in the spina bifida children. In contrast, Fulthorpe (1974) noted aggressiveness and assertiveness in some boys with spina bifida. Teachers rated spina bifida children as having shorter attention spans (Tew & Laurence, 1975).

Connell and McConnel (1981) conducted a study on 45 children who had been surgically treated for hydrocephalus. Both parent and teacher questionnaires were included, as well as individual semistructured interviews with both parents and children. The parents rated irritability (which was usually associated with fatigue) as being a problem in all but two of the children. In addition, one-third of the children were noted as having an attentional deficit accompanied by impulsivity and distractability. These authors concluded that a child born with hydrocephalus is at least four times as likely as her or his normal peers to develop a psychiatric disorder. They found that the psychiatric diagnosis did not appear to be related to IQ, physical handicap, or shunt malfunctioning but did appear to be related to perceptual handicaps identified during the evaluation (including auditory, visual, visuomotor, speech and language, and attentional deficits). They also found that psychiatric disturbance was associated with emotional or social problems and the quality of care in the home. These results parallel those obtained on a mixed group of physically handicapped children by Rutter (1978; Seidel *et al.*, 1975).

Lorber and Schloss (1973) had parents complete a behavior scale on their adolescent children with spina bifida. The problems noted most frequently were depression, sullenness, temper tantrums, needless worry about health, nail biting, and disobedience.

Swisher and Pinsker (1971) used an informal conversational situation to look at hypervocal behavior in hydrocephalic children with spina bifida. They found that these children initiated more conversation than a control group, and that their conversation had a significantly greater number of words and sentences. Hydrocephalic children tended to use language that was rated bizarre and inappropriate more frequently than children in a control group; this tendency decreased with age. Teacher ratings indicate that hypervocal children tend to have significantly more behavior problems (Tew, 1979), as well as more restless, fidgety, and inattentive behavior (Anderson & Spain, 1977).



## MUSCULAR DYSTROPHY

### *Population Defined*

In this disorder, there is a progressive weakness and degeneration of skeletal muscle (Moosa, 1974). Most psychological investigations deal with the Duchenne-type of muscular dystrophy (DMD), which characteristically affects boys because it is carried by a sex-linked recessive gene. However, the disorder occurs as the result of spontaneous mutation in about 30% of the affected males (Hanson & Zellweger, 1968, as cited in Karagan, 1979) or, more rarely, in females, with autosomal recessive inheritance. Duchenne muscular dystrophy is by far the most common and most rapidly progressive type of muscular dystrophy (Karagan, 1979).

Symptoms are usually observed during the first years of life. Delays are often noted in the motor milestones of infancy. These children are unable to hop, jump, or run normally, and the presenting symptoms often include sudden, frequent falls; waddling gait; and difficulty climbing stairs. Cramps in the calves are another common feature. Various muscle groups may become prominent. The facial muscles are not affected until the terminal stages. Swallowing and sphincter control are usually preserved. Gradual increases in muscle weakness may be interrupted by periods of 6–12 months in which no deterioration is noted. Rapid changes may be noted particularly after periods of immobilization for illness or fracture. If such periods of bed rest are frequent, the child may lose the ability to walk earlier than the usual 9–12 years.

As long as the child is able to walk, the only deformity noted is the shortening of the tendoachilles, which causes the child to walk on his or her toes. Once confined to a wheelchair, the child rapidly develops contractures of the hip and elbow flexors and is at risk for developing scoliosis and foot deformities if proper supports are not provided. Death usually results from pneumonia in the late teens and may occur suddenly (Moosa, 1974).

### *Special Considerations*

Mearig (1979) raised a variety of methodological issues in questioning the commonly held notion that DMD is associated with impaired intellectual potential (see "Standardized Tests"). The methodological issues raised include the heterogeneity of the medical condition of the samples studied, the diversity of educational backgrounds, and educational opportunities missed because of medical treatment (Morrow & Cohen, 1954; Walton & Nattras, 1954). Many studies have been done with lower socioeconomic groups, a procedure that raises the issue of generalizability. Using evaluations done in medical clinics may introduce a compliance bias because of negative associations with pain and/or embarrassment experienced during medical procedures. However, a variety of control groups have been used in the studies of intellectual functioning in DMD patients. These groups include children with chronic physical incapacities such as diabetes mellitus (Worden & Vignos, 1962), spinal muscular atrophy (Florek & Karolak, 1977; Kozicka, Prot, & Wasilewski, 1971; Worden &

Vignos, 1962), and postpoliomyelitis (Michal, 1972, as cited in Karagan, 1979). All of these groups have manifested average mean IQs, which indicate that severe muscle impairment, even when it arises in early infancy, is not sufficient to lead to poor performance on intelligence tests.

Others have concluded that psychosocial factors cannot account for depressed IQs in DMD patients because the depressed IQ scores occur at an early age. These children have minimally restricted mobility, so they are able to explore their environments adequately, and most of the younger children attend school in regular classrooms (Karagan & Zellweger, 1978; Marsh & Munsat, 1974; Prosser, Murphy, & Thompson, 1969).

Mearig (1979) took a psychodynamic perspective on the special problems that exist in a degenerative disorder. She interpreted the losses experienced by DMD children in the context of Erikson's stages of psychosocial development. Her major premise is that one cannot estimate the degree of psychological impact of the disorder based on the degree of physical impairment. For example, a relative loss of control over major muscle groups may result in unpredictable responding or stumbling long before the child is confined to a wheelchair. The psychological impact of this loss of control may be great for a latency-age child for whom a major developmental task is mastering his or her environment. Mearig noted that the child may experience a series of impacts as growth, understanding, and the disease progress. She went on to note the unique psychological considerations that arise because the disorder is degenerative and leads to death at an early age. These factors make it difficult to find appropriate comparison groups to control for social and emotional factors.

## *Interviewing*

### *Intellectual Assessment*

Karagan (1979) reviewed six studies done before 1960 that document a higher prevalence of mental retardation among children with muscular dystrophy. Several of these studies involved a clinical rather than a psychometric evaluation of mental retardation. Other studies failed to document the higher incidence of retardation in mixed groups of dystrophies (Morrow & Cohen, 1954; Schoelly & Fraser, 1955). Walton and Natrass (1954) found only a mild degree of impairment.

### *Personality Assessment*

Firth, Gardner-Medwin, Hosking, and Wilkinson (1983) conducted guided interviews with parents of boys with DMD. The interview schedule covered topics such as the diagnosis, neonatal screening, problems the parents had experienced, and the effects of DMD on the family. Boredom, depression, and behavior problems were cited as the most common negative effects reported by parents, but it is unclear exactly how parental reports were placed in these categories.

## Standardized Tests

### Intellectual Assessment

Karagan (1979) reviewed 17 studies that looked at the level of intellectual functioning in DMD. Most of these studies used the Wechsler scales or the Stanford-Binet. With one exception (Sherwin & McCully, 1961), these studies supported the hypothesis that intellectual abilities are frequently impaired in children with DMD. Nine of these studies reported general or full-scale IQs that were lower than normal, and six reported a higher incidence of mental retardation (20%–30%). The mean IQs ranged from 68 to 91. In some instances, the entire IQ distribution appeared to be shifted downward by one standard deviation (e.g., Cohen, Molnar, & Taft, 1968; Florek & Karolak, 1977; Leibowitz & Dubowitz, 1981; Prosser *et al.*, 1969).

Sherwin and McCully (1961) used the verbal portion of the WISC to assess the intelligence of 15 boys (aged 10–14) who were confined to wheelchairs. The results did not deviate from those found in normal populations ( $M = 103$ ; range 90–120). Mearig (1979) also failed to find evidence to support the claim that DMD is associated with lowered intellectual functioning.

A number of investigators have studied the intellectual functioning of relatives of DMD patients (Cohen *et al.*, 1968; Kozicka *et al.*, 1971; Prosser *et al.*, 1969; Worden & Vigneos, 1962). Higher mean IQs were found among unaffected siblings and relatives. In addition, there was a concordance in intellectual levels between DMD patients and their affected siblings. Prosser *et al.* (1969) found a correspondence between the IQs of DMD patients and those of their families. For example, severe mental retardation was found in patients from dull families; normal intelligence was found in children from bright families. According to Dubowitz (1965), normal intelligence may be associated with the autosomal rather than the sex-linked form of DMD, but this hypothesis has not been supported by other studies (Prosser *et al.*, 1969; Robinow, 1976; Zellweger & Neidermeyer, 1965.)

Marsh and Munsat (1974) obtained data from DMD patients at various ages that suggest that deficits in verbal IQ are noted relatively early and are non-progressive. On the other hand, performance IQ tends to decrease over time, as the physical disability progresses. Additional evidence has been presented that supports this observation (Karagan & Zellweger, 1978; Leibowitz & Dubowitz, 1981; Zellweger & Neidermeyer, 1965). Other studies have not supported this hypothesis (Mearig, 1979; Prosser *et al.*, 1969; Rosman & Kakulas, 1966).

Attempts have been made to determine whether various features of the myopathy are related to the degree of intellectual impairment. The various factors investigated include the duration of the illness, the age of onset, the clinical severity of the myopathy, the level of the enzymes used in diagnosis, the current age, and the degree of functional disability (Allen & Rodgin, 1960; Cohen, Milnar, & Taft, 1968; Prosser *et al.*, 1969; Worden & Vignos, 1962; Zellweger & Neidermeyer, 1965). In general, no significant relationships have been found between IQ and any of these variables.

### *Visual-Motor Integration*

Shorer (1964) used two cards from the Bender-Gestalt to assess visual-motor functioning in boys with DMD and found some evidence of impairment. Marsh (1972) measured visual-motor integration using the Bender-Gestalt and the Kopitz Developmental Scoring System in a group of boys with DMD (aged 6–13). Approximately 66% of the boys tested obtained impaired scores indicating mild to severe visual-motor disability. On the Bender-Gestalt, Leibowitz and Dubowitz (1981) found that the average score in muscular dystrophy subjects was between one and two standard deviations below the mean, although they noted that most of the children did well and that the average had been pulled down by a few who did very poorly. These authors noted that this task requires symbolic functioning in addition to visual-motor coordination.

### *Reading Skills*

Leibowitz and Dubowitz (1981) gave the Burt Revised Word Reading Test (Burt, 1976) to a group of boys with DMD. The reading ability in this group was variable. The mean scores were comparable to verbal IQs, but the median of the scores was well below this level. These authors obtained a correlation of 0.76 between reading skill and verbal IQ. These results appear to be consistent with those of other studies that found that physically handicapped children tend to have some deficits in reading (Rutter *et al.*, 1970; Seidel *et al.*, 1975).

### *Personality*

Leibowitz and Dubowitz (1981) found that DMD children's scores on the Goodenough-Harris Drawing Test were comparable to their verbal IQs. Although the drawings were immature, no characteristics were noted that indicated the degree of the child's handicap. These results confirm the earlier ones of Harris (1963) that the child's ability to draw a human figure apparently depends primarily on cognitive factors and is independent of the child's appearance or physical condition.

Harper (1983) compared the MMPI profiles of adolescents with DMD with those of adolescents with nonprogressive orthopedic disabilities. He found indicators of social inhibition, passiveness, and depression in both groups. The characteristics were interpreted as a response to the realities imposed on mobility and lifestyle. There was considerable heterogeneity in the profiles obtained, but about half the boys in each group exhibited some adjustment concerns. In both groups, as the severity of the disorder increased, the social introversion and atypical responding scales tended to approach normality, a finding suggesting more positive adjustment. It has been suggested that, in nonprogressive conditions, those with more severe disabilities have a more clearly defined functional and personal environment (Colman, 1971; Cowan & Bobrove, 1966). More ambiguity may arise for mildly impaired individuals concerning their limits in a number of settings, creating more stress. A similar process may go on in a

progressive disorder such as DMD. As the condition becomes more debilitating, the child's limits may become more obvious, and the stress of uncertainty in making decisions may thus be alleviated. However, Harper (1983) also found that a rapid decline in DMD patients was associated with increased social withdrawal.

### *Behavioral Approaches*

The Rutter Behavior Questionnaires A (for parents; Rutter *et al.*, Whitmore, 1970) and B (for teachers; Rutter, 1967) were used by Leibowitz and Dubowitz (1981) to assess emotional disturbance in children with DMD. Approximately 33% of the DMD children were rated in the emotionally disturbed range on the parent scale, and about 37% received ratings in that range on the teachers' scale. Parents were more likely to report neurotic behaviors, and teachers were more likely to report antisocial ones, but no clear-cut pattern emerged. This group of DMD children had a higher incidence of deviant scores on the Rutter questionnaires than has been found previously in normal children or in physically handicapped children without cerebral involvement. This incidence level is comparable to that found in physically handicapped children with brain damage (Rutter *et al.*, 1970; Seidel *et al.*, 1975). Leibowitz and Dubowitz (1981) noted that children who scored poorly on the Goodenough-Harris Drawing Test, the Bender-Gestalt, or the Burt Revised Word Reading Test (Burt, 1976) tended to exhibit emotional disturbance at school. Similar correlations were not found between cognitive skills and parent ratings of emotional disturbance. Hence, these authors suggested that the behavior observed by teachers may be a manifestation of the failure and frustration experienced in school because of skill deficits.

## SPEECH DISORDERS

### *Population Defined*

Speech disorders are relatively common in young children. In grades K-4, approximately 12%-15% of the students have a speech disorder (Milisen, 1971). A speech disorder can seriously impair communication; 5% of children entering school cannot be understood by strangers (Rutter & Martin, 1972). In Grades 4-8, the percentage of children with speech disorders drops to 4%-5% (Milisen, 1971).

Most classifications of speech and language disorders distinguish four basic types: disorders of articulation, voice, rhythm or fluency, and language or communication (Eisenson, 1980). Articulation disorders are the most common (Carter & Trost, 1966) and involve difficulty in the production of speech sounds. The extent of articulation difficulties may be slight or severe and may affect a few or many speech sounds. In first grade, approximately 15%-20% of the children have articulation problems. The incidence decreases until age 9-10, with little improvement occurring without therapy in older children (Milisen, 1971). Artic-

ulation disorders may be due to organic, structural defects of central or peripheral origin, such as cerebral palsy or cleft palate. Dental irregularities, malocclusions, and defects in the tongue may cause articulation problems. Articulation disorders may be secondary to other disorders, such as mental retardation, hearing problems, and brain dysfunction, or they may be due to nonorganic factors (Ingram, 1959).

Disorders of voicing (dysphonia) include deviations in voice pitch, loudness, and quality. Some classification systems include resonancy-based voice disorders in this group, such as hyper- and hyponasality (Boone, 1980). Voice disorders are relatively uncommon and account for only about 4% of speech-disordered children (Ingram, 1959). The causes of voice disorders include tumors or disease affecting the larynx, allergies, alterations in vibration of the vocal cords, or respiratory dysfunction (Graham, Bashir, & Stark, 1983).

Fluency or rhythm disorders include stuttering and cluttering. In cluttering, the speech is fast and the words run together, becoming unintelligible. The clutterer may improve his or her speech by paying attention to it (Eisenson, 1980). Most clutterers show consistent improvement in speech intelligibility before age 5 (Milisen, 1971). Stuttering is "an involuntary repetition of a sound as well as an inability to move beyond it" (Ingram, 1959, p. 446). At least one-third of all children stutter for a while while learning to talk (Renfrew, 1972). Like all speech disorders, stuttering is more common among males than among females (Ingram, 1959). The incidence of stuttering is between 1% and 4% of children in elementary school, with an increase between Grades 2 and 5 (Milisen, 1971).

Language disorders include delay in language development and problems in the expression or comprehension of language. The most common cause of language delay is mental retardation (Eisenson, 1980). Language disorders are associated with prenatal and perinatal risk factors, measles, and low socioeconomic status (Milisen, 1971). Language disorders are also associated with deafness, childhood psychosis, cerebral trauma, and severe environmental deprivation. The differential diagnosis of childhood autism, mental retardation, and communication disorders is complex (Wing, 1979). Some suggestions for differential diagnosis are presented in Eisenson (1980) and Lenneberg (1964). Language disorders associated with childhood psychosis and mental retardation received more discussion in previous chapters.

Developmental aphasia is a diagnosis applied to a language disorder in the presence of central nervous system dysfunction (Eisenson, 1980). The child has a normal IQ and normal hearing, a normal ability to relate to others, and no evidence of significant emotional disturbance (Graham *et al.*, 1983, p. 861). Childhood aphasia is relatively rare, occurring in only 0%–.6% of the school-aged population (Milisen, 1971).

### *Special Considerations*

When considered as a group, the majority of speech-disordered children are physically normal. However, the incidence of physical problems is greater than in the general population and includes children with cerebral palsy, cleft palate, and hearing loss (Eisenson, 1980).

An audiological evaluation is central to the diagnosis of speech and language disorders, particularly in distinguishing between central and peripheral causes of speech problems (Culbertson, Norlin, & Ferry, 1981). Mild to moderate hearing loss may result from chronic otitis media, an inflammation or infection of the middle ear (Beadle, 1982). Otitis media is also associated with delayed expressive and receptive language skills (Graham *et al.*, 1983). Down-syndrome and cleft-palate children are susceptible to this type of conductive hearing loss.

Cerebral-palsied children have a high incidence of speech disorders with estimates ranging from 30% to 70% (Ingram & Barn, 1961). All types of speech disorders may occur and can be related to hearing loss, mental retardation, and neuromuscular disorders (Marks, 1974). The muscles controlling articulation, respiration, resonance, and voicing may be affected (Mysak, 1971).

Irwin (1972) was responsible for the most extensive research on cerebral palsy speech. He developed and standardized a number of speech and language tests and compared the performance of cerebral-palsied and mentally retarded children. The cerebral-palsied children had poorer articulation but better sound discrimination than the mentally retarded children. Athetoids were found to have more articulation problems than spastics (Hammill, Myers, & Irwin, 1968). Hemiplegics were more likely to have normal speech than children with any other type of cerebral palsy (Ingram & Barn, 1961).

Orofacial clefts are separations or spaces between parts of the mouth or face that are normally joined (Ewanowski & Saxman, 1980). Most clefts affect the lip and/or the hard or soft palate. There is great variation in the shape and extent of orofacial clefts. Speech difficulties are directly related to the degree of the cleft and the extent of dental problems (Eisenson, 1980).

There are three common characteristics of cleft palate speech: articulation problems, hypernasal voice quality, and reduced loudness (Ewanowski & Saxman, 1980). Thirty percent of cleft-palate children have an inadequate velopharyngeal mechanism, a major cause of speech disorders (Ewanowski & Saxman, 1980). Cleft-palate children have difficulty closing off the nasal cavity from the oral cavity, a seal that is needed for all nonnasal consonants and vowels (Graham *et al.*, 1983). Articulation disorders are more common with cleft palate than with cleft lip (Ewanowski & Saxman, 1980).

### *Interviewing*

Interviews with speech-disordered children and their parents have obtained information about the rate and type of child behavior problems. The results of a psychiatric interview with 100 children referred to a speech and hearing clinic were reported by Mattison, Cantwell, and Baker (1980). Children, 5 years or older, were questioned about specific problem areas, and the interviewer rated the severity of the problem on a 5-point scale. Problems were reported by more than 30% of the children interviewed, including somatic concerns, temper outbursts, poor relationships with siblings or peers, worry, and learning problems.

There is some evidence to suggest that the type of behavior problem observed is related to the type of speech disorder. The mothers of cleft-palate children, aged 6–18 years, were interviewed to obtain reports of behavior prob-

lems (McWilliams & Musgrave, 1972). The children were divided into three groups based on the degree of speech problems: normal speech, articulation errors, and hypernasality plus articulation errors. Significantly fewer behavior problems were reported by mothers in the normal speech group (mean = 1.97) than in the other two groups. The two speech-disordered groups did not differ in the number of problems reported, and the average was approximately three symptoms per group.

There were differences in the types of problems frequently reported by the mothers. The mothers of children with articulation errors were more likely to identify a bad temper, bed-wetting, a preference for being alone, and fearfulness as characteristic of their child. No predominant symptoms were reported in the other two groups. A drawback to the report was that the symptom list and the response format used were not included.

Interview data were combined with standardized test data to examine within-group comparisons with cleft-lip and -palate adolescents (Richman, 1983). Students reported self-perceptions and satisfaction with school achievements and social activities in a structured interview. They also reported the amount of concern they had about their speech and facial characteristics. The cleft-palate students were divided into two groups based on MMPI clinical scale scores: one group had scored above 70 on at least one scale, and the other group had not. The students in the high-scoring group were more likely to report dissatisfaction with educational and social achievements than the students with lower MMPI scale scores. The students who expressed the most concern about their facial appearance obtained high scores on the Social Introversion scale. Concerns about speech were not related to the MMPI groupings. Facial concern was thought to be more relevant to the Social Introversion scores than speech concerns in this age group because cleft-palate adolescents may expect further facial surgery, whereas speech therapy has often been completed or is nearing completion.

Interview data indicate that speech-disordered and cleft-palate children and their parents recognize a high rate of behavior problems and personal concerns. These appear to be present at all age levels and for a wide range of speech disorders.

## *Standardized Tests*

### *Cognitive Assessment*

The heavy reliance on verbal material in many psychological tests places speech- and language-disordered children at a disadvantage. Even the Performance subtests in the Wechsler scale require language comprehension. Nonverbal tests are routinely used to supplement or substitute for the Binet or the WISC-R in the cognitive assessment of speech-disordered children.

The tests often used with speech-disordered children include the Peabody Picture Vocabulary Test, the Leiter Performance Scales (e.g., Korst, 1966; Spellacy & Black, 1972), the Columbia Mental Maturity Scale (e.g., Hirschenfang,



1961), the Raven Progressive Matrices, and the Pictorial Test of Intelligence (Culbertson *et al.*, 1981). In addition, speech-disordered children may be given the Hiskey-Nebraska Test of Learning Aptitude, a nonverbal test for ages 3–16 that has norms for hearing-impaired and normal hearing children (Culbertson *et al.*, 1981). The instruments used in the assessment of communication are detailed in Mulliken and Buckley (1983).

Culbertson *et al.* (1981) presented several signs that an examiner may note during testing that indicate that a referral for speech and language evaluation is needed: simplistic sentence structure, unvarying grammatical construction, gaps in vocabulary, difficulty using plurals or possessives, and awkward definitions. Other signs that a speech evaluation should be obtained include the child's apparent misunderstanding of or failure to hear questions, effortful or infrequent verbalizations, echolalia, and dysfluency.

Research on the intellectual level of speech-disordered children has tended to evaluate subgroups of speech disorders, such as children with articulation problems or language delay. A greater frequency of articulation problems is found in mentally retarded children than in children of average IQ (Winitz, 1964). Within the average IQ range, low and positive correlations have been obtained between articulation and intelligence. However, articulation improvement and intelligence do not appear to be associated (Winitz, 1964).

A large-scale study of language delay in young children was completed in New Zealand (Silva, McGee, & Williams, 1983). The results indicated that 3-year-olds with language delays were more likely to experience reading difficulties and to obtain a below-average IQ at age 7 than nondelayed children. The more stable the delay in language, the more likely were deficits in both verbal and performance IQs.

A review of the literature on the intelligence of cleft-lip and -palate children concluded that the IQ distribution is not shifted downward (Richman & Eliason, 1982). Verbal IQ deficits may be present, but the performance IQ is normally distributed. The depressed verbal IQ may be associated with hearing loss or speech disorders. The school achievement of the cleft-lip and -palate children is lower than expected based on IQ (Richman & Eliason, 1982). A number of factors may depress the achievement scores, including verbal deficits and lowered teacher or parental expectations.

### *Personality Assessment*

Research on the personality characteristics of speech-disordered children has examined both the children and their parents. The focus of the research has been on the personality styles of particular subgroups, self-concept, and the incidence of maladjustment.

Two reviews of personality research on functional speech disorders concluded that the research failed to demonstrate that a particular personality pattern was associated with speech disorders or that parents or children were maladjusted (Bloch & Goodstein, 1971; Goodstein, 1962). Within-group differences were suggested as a more fertile focus of research.

Much of the attention given to personality variables in speech-disordered children has focused on stutterers. A variety of theories about stuttering have been offered, including neurological and psychological causes. Stuttering has been viewed as a neurosis, as being a result of perfectionistic parents, as being due to mixed cerebral dominance, and as being learned behavior (Gemelli, 1982). Projective studies of stuttering were reviewed by Sheehan (1962), who concluded that there was no personality pattern that characterized stutterers. The only reliable difference obtained between stutterers and nonstutterers was a tendency toward a lower level of aspiration in stutterers.

Research on the personality adjustment of cleft-lip and -palate children has followed a similar trend. Studies based on group comparisons with global personality measures have seldom found differences between cleft-palate children and controls in psychological adjustment. Studies examining associations between the severity of the facial disfigurement or the speech disorder and adjustment have also been inconclusive (e.g., Watson, 1964).

Objective and projective measures of self-concept have been used in several studies. No difference in global self-concept scores was found on the Piers-Harris Scale in groups of cleft-lip or -palate and noncleft 11- to 13-year-olds (Kapp, 1979). Significant differences were obtained on subscale scores, however. Children with clefts were more dissatisfied with their physical appearance than control children. Female children with clefts reported more anxiety, unhappiness, and dissatisfaction than noncleft girls.

A study using a projective measure of self-concept found that cleft-palate children (aged 10–18) reported a lower degree of parental acceptance than noncleft children. Body image and cognitive measures did not differentiate cleft and control groups (Brantley & Clilford, 1979).

Richman and Eliason (1982) concluded that cleft-lip and -palate children as a group do not show significant signs of maladjustment, but that mild adjustment problems do occur and may be related to concerns about physical appearance. These concerns may be most relevant to the adjustment of female children with clefts.

### *Behavioral Approaches*

Checklists and rating scales completed by parents or teachers are the most frequently used behavioral methods of assessing speech-disordered children. Studies have examined the prevalence of psychiatric disorders and the specific types of behavior problems.

Children attending special classes and diagnosed as requiring speech therapy were compared to regular class students (Grades K–8) on the Behavior Problem Checklist (Quay & Peterson, 1967) completed by teachers (Lindholm & Touliatos, 1979). The children requiring speech therapy were rated significantly higher on the Personality Problem and Psychotic Behavior dimensions than the regular class students and did not differ from them on the Conduct Problem or Socialized Delinquency dimensions. Two items on the Psychotic Behavior scale specifically refer to speech and may have accounted for the group difference. In

addition, the special-class placement of the speech-disordered group may have affected the results of the study, as classroom placement may have been due, in part, to prior teacher observations of behavior problems.

An extensive series of publications by Cantwell, Baker, and Mattison have examined the prevalence and type of psychiatric disorders among children referred for speech and language evaluation. These authors have used a modified Rutter psychiatric interview as well as Conners's and Rutter's rating scales completed by parents and teachers. In a prevalence study completed at a community speech and hearing clinic, Cantwell, Baker, and Mattison (1979) found that 53 of 100 referred children had received at least one psychiatric diagnosis. The most common diagnosis was attention deficit disorder, followed by oppositional disorder. No specific psychiatric disorder was associated with speech disorders, and the results indicated that speech-disordered children are at risk for psychiatric problems.

In a study conducted with a larger sample of speech-and-hearing-clinic referrals, Cantwell and Baker (1983) found that approximately 4% of the sample had received an affective disorder diagnosis. The children in this subgroup tended to be older (mean age = 11 years) than the referral sample, and they were more likely to have a pure language disorder, rather than a speech disorder. The affective disorder group also tended to receive multiple psychiatric diagnoses, including attention deficit disorder.

The use of behavior rating scales by speech and hearing evaluators as screening instruments for psychiatric disorders was recommended by Mattison, Cantwell, and Baker (1982). They found that the combination of a parent and a teacher rating scale could provide a fairly accurate determination of the need for psychiatric referral. Given the relatively high rate of psychiatric disorders in speech-disordered children, a practical screening device would be a valuable tool.

After reviewing the literature on the incidence of psychiatric disorders in speech-disordered children, Cantwell and Baker (1977) suggested that, in most cases, psychiatric problems are indirectly caused by speech disorders. An association between pure speech disorders and reading problems and between reading problems and behavior problems was one possible course of indirect influence. These authors also suggested that speech and language disorders can disrupt peer relationships and thereby influence the development of emotional problems. Early speech and language remediation was viewed as a potential prevention effort to reduce the rate of psychiatric disorders in speech-disordered children (Cantwell *et al.*, 1979).

## CONCLUSIONS

Although the four types of physical handicaps discussed in this chapter are quite different, some common characteristics can be noted. Physically handicapped children may experience life-threatening illnesses in which medical management is a first priority and the psychological status of the child is of less

importance. Disruptions in the child's education and peer and family relationships may result from repeated illnesses, hospitalizations, and surgery. Physically handicapped children are often multiply handicapped, being subject to a variety of associated disorders. The combination of disabilities makes psychological assessment more complex and often requires interdisciplinary evaluation and intervention for several years.

A high rate of below-average IQs and poor school achievement have been found in groups of physically handicapped children, although the within-group variability is great. It has been unclear what negative effects on cognitive abilities and achievement may be due to the physical handicap *per se*, to attempts by the child and others to adjust to the disability, or to disruptions in normal development because of interrupted school and peer relationships.

Relatively little information is available on the developmental progress of physically handicapped children. Studies on intellectual development indicate that some physically handicapped children (e.g., those with cerebral palsy) continue to progress at a later age than nonhandicapped children, whereas others (e.g., those with DMD) experience a deterioration in functioning. Much less is known about the personality development of physically handicapped children. There are some indications that adjustment to a mild physical disability is more difficult than to a severe disability. More within-group research and longitudinal studies are required.

Physically handicapped children are at risk for psychiatric disturbance, with estimates as high as one-third to one-half of the children affected. There is some consensus that psychological disturbance may result from aspects of the physical disorder *per se*, in combination with family and environmental influences. No single psychiatric disorder characterizes physically handicapped children, although they are more likely to be described as withdrawn than as aggressive. Prevention efforts are needed to reduce the incidence and severity of maladjustment among physically handicapped children.

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# 25 *Cognitive Assessment in Medically Ill Children*

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## INTRODUCTION

The cognitive development of children can be compromised by both biological and psychosocial factors. Trauma, neural demyelination, cerebrovascular malformation, tumor, infection, asphyxia, and atrophic conditions frequently underlie disturbed neurological functioning. These conditions can be associated with cognitive and behavioral disturbances, including mental retardation, learning disability, and developmental delay.

In addition to disrupted intellectual capacity following direct injury or pathology of the brain, cognitive disturbances may also arise as the consequence of medical illness and its treatment. There are at least four avenues by which this can occur. An organ system may be functionally inefficient and thus may not fulfill the brain's metabolic needs, as in asthma, in which the pulmonary system cannot efficiently meet the brain's high demand for oxygen. Second, a diseased organ or system may upset metabolic homeostasis, as when thyroid disturbances produce cognitive disturbances ranging from mild problems in attention and memory to a state of delirium. Third, pathology of an organ system may induce a toxic state because of the failure to eliminate waste products from circulation. Uremia from kidney failure and portal-systemic encephalopathy from liver disease exemplify this type of disorder. Finally, a person may have an inherited incapacity to manufacture certain enzymes. Phenylketonuria is a well-known type of disorder in which profound mental retardation can occur when the absence of phenylalanine hydroxylase blocks the conversion of phenylalanine to tyrosine, resulting in toxic concentrations of the former substance in the blood.

This chapter reviews literature pertinent to organ system pathology and cognitive functioning in children. It will be observed that both acute and chronic medical conditions, by disrupting the brain's functional integrity, are associated with a number of cognitive disturbances. In discussing issues associated with

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the cognitive assessment of children with such illnesses, the point needs to be underscored that this area of inquiry is quite new, and that definitive conclusions about the precise causal basis of the cognitive impairments cannot be advanced. Most medical conditions involve a disruption of more than one biological system, and because few studies conducted to date have used multivariate techniques to delineate how the several systems interact, it is not easy to specify cause-and-effect relationships. Nonetheless, inasmuch as cognitive capacity is one determinant of educational achievement and future occupational success, and because it potentially influences how effectively the child can mobilize coping skills, it is important for clinicians and researchers alike to be aware of the impact of medical illness on cognitive functioning in children.

## NEUROPSYCHOLOGICAL ASSESSMENT

### *Measurement Issues*

The assessment of cognitive functioning in children with medical conditions should fulfill two main objectives. First, it is essential to determine if the medical disorder has impaired the *level* of cognitive functioning, or capacity. Second, the evaluation should provide information with respect to whether the *rate* of cognitive development is compromised. Thus, not only must the neuropsychological examination describe cognitive functioning at a given point in time, it must also monitor the maturation and development of cognitive processes.

In order to achieve these two objectives, several procedures are important. First, serial evaluations must be conducted. This method enables the examiner to identify changes within the context of the overall developmental process. From a practical standpoint, it entails using test measures that either are unaffected by practice or are standardized in equivalent forms. Second, the cognitive assessment must encompass a range of test measures that comprehensively profile cognitive processes. To this end, using a single measure of "organicity," such as the Bender-Gestalt test, is inadequate for this purpose. The task before the clinician is not merely to detect the presence of cerebral pathology; rather, the more important clinical requirement is to profile the child's cognitive strengths and weaknesses. In this fashion functional capacities can be identified, and the information obtained can be used for educational and vocational planning.

In addition, the neuropsychological assessment of the child suffering from a medical disorder must take into consideration the clinical status of the child, the treatment effects, and any emotional disturbance.

### *Clinical Status*

For conditions that are chronic and progressive, the point in the natural history of the illness at which the child is tested substantially affects the outcome of the assessment. For example, in end-stage renal disease, the cumulative neuropathological changes from chronically disordered metabolism would be

expected to be associated with greater cognitive impairment than in less advanced cases of kidney failure. With respect to acute medical conditions, the severity of the clinical disturbance correlates negatively with cognitive capacity. Thus, a subclinical hyperthyroid condition may produce no detectable cognitive impairment, whereas in more severe cases, substantial alterations in consciousness may occur, and delusions may be manifest.

### *Treatment Effects*

Certain medications, such as steroids and cancer chemotherapy, may impair cognitive efficiency. Therefore, if possible, cognitive testing should be conducted while the child is not on a drug regimen, or repeated testing should be done while the child is both on and off medication.

### *Emotional Disturbance*

It is also important to recognize that a severe, life-threatening, or chronic disease can cause emotional and social problems. The presence of persistent emotional and social problems, in turn, influences cognitive development. Prolonged or repeated absences from school because of hospitalization, doctor visits, and sick days result in diminished learning opportunities that militate against optimal development. Hence, deficits observed during neuropsychological testing may have a multifactorial basis and may not be solely the product of cerebral dysfunction stemming from the specific effects of the medical illness.

### *Assessment Strategy*

The following assessment strategy is a means of maximizing information accrual in a minimum amount of time and in a cost-efficient manner.

#### *Step 1*

Initially, the clinician should attempt simply to identify the presence of impaired cognitive functioning. Tests that are both brief and sensitive measures of brain integrity, even though they neither are comprehensive nor have lesion-localizing value, serve this purpose and are especially useful in evaluating medically ill children who may not be able to tolerate long periods of testing. Typically, tests of attention, psychomotor speed, and coordination provide a good indication of cerebral efficiency because they require effortful responding, and also because prior learning or experience does not significantly influence performance.

#### *Step 2*

If the findings obtained in Step 1 suggest the presence of cerebral dysfunction, the clinician should next comprehensively examine cognitive capacity as it relates to the stated objectives of the assessment. For example, a wide-ranging

evaluation of psychomotor capacity is necessary if there is some question about the physical activities in which the child can still safely engage. Such information can be generated from a battery of tests that measures a variety of behaviors. One of two basic strategies can be adopted: (1) a standardized test battery for children (e.g., the Reitan-Indiana Neuropsychological Battery) can be administered, or (2) a specialized test battery can be compiled that is particularly suited to the child's needs and the assessment objectives. Flexibility exercised in the selection of such a test battery has obvious advantages, especially if the clinician prefers or needs to make ongoing decisions about the course of the assessment as information emerges. The primary disadvantage of this approach is that it does not enable the examiner to establish a data-base system for research or for program evaluation purposes. However, regardless of the strategy used, the objective of the assessment in this second stage is to evaluate the impact of the illness on the spectrum of cognitive processes, including learning, memory, attention, perception, language, abstracting, psychomotor, and spatial skills.

### *Step 3*

Having profiled the child's cognitive strengths and weaknesses, the clinician may find it of additional value to examine in depth one or more capacities that are found to be deficient relative to the child's chronological age. From such information, specific targeted interventions can be implemented. To this end, a modality-specific (e.g., memory, attention, or language) battery of tests can be administered. This battery may be a commercially available product (e.g., the Bruninks Test of Motor Proficiency), or the examiner may develop a battery of tests based on the particular clinical parameters relevant to the patient, the environment, the assessment objectives, and the intervention aims.

This three-stage evaluation process proceeds from the general to the specific. A practical advantage of this type of assessment is that it is amenable to a high-volume caseload. The initial screening saves substantial time and cost, whereas the subsequent assessments provide a detailed analysis of the nature and extent of the cerebral dysfunction. This approach can maximize the generation of information while minimizing the number of tests needed to thoroughly evaluate a medically ill child.

## TEST SELECTION

A variety of test measures are available for the assessment of children with known or suspected cerebral disorders. The most commonly used measures are described in Chapter 6 and are cited by Slomka and Tarter (1984); however, numerous other standardized tests are described in Lezak (1983) and in Spreen, Tupper, Risser, Tuokko, and Edgell (1984). The Reitan-Indiana Neuropsychological Test Battery is one instrument that provides a pandemic evaluation of cognitive functioning.

The selection of the neuropsychological tests should be guided by several

considerations. In view of the physical discomfort caused by the child's medical condition, the tests should be as short as possible. The effects of medication must be carefully scrutinized. Tests that are timed, that demand a high degree of mental effort, or that require sustained task involvement are particularly sensitive to drug effects and so may generate artifactually low scores. In addition, illnesses vary greatly in severity and in their impact on function. Thus, the tests used should elicit performances that can be scored in a graduated fashion, rather than on a two- or three-category scale. Many illnesses, particularly those having a metabolic etiology, have a variable clinical course. Hence, the results obtained at one testing may not be representative of the child's general cognitive capacities. Finally, depending on the type of illness, the neuropsychological deficits may be either permanent or reversible. Even if the cerebral disorder is likely to be permanent, habilitation should be pursued because the child's brain, which functionally develops until mid-adolescence, has substantial plasticity.

In summary, the neuropsychological assessment of children with medical disorders proceeds along the same lines as the evaluation of children who suffer from a primary neurological illness. The cognitive manifestations of the various types of medical illnesses, as discussed below, are diverse with respect to their quality and their severity. Given the complexity of the etiological determinants and the range of manifest neuropsychological impairments, it is essential that the clinician be aware of the need for a comprehensive assessment approach that monitors neuropsychological functioning over time.

## MEDICAL CONDITIONS

### *Acute Lymphoblastic Leukemia*

Hematological conditions have the capacity to influence every system of the body. Because of its historically poor prognosis and survival rates, the effects on cognition of one of these diseases, acute lymphoblastic leukemia (ALL), has come under systematic investigation only since the mid-1970s, as new advances in treatment have been made. With the development of chemotherapy that can successfully induce remission in children with ALL, the survival rate for this disease has improved rapidly. Whereas in 1950, the average life expectancy was a few months after the initial diagnosis, survival for up to five years is now common, and a small but significant number of children are surviving for more than a decade following diagnosis. In large part, this improved prognostic picture is due to the prophylactic use of cranial (or craniospinal) irradiation and intrathecal injections of the drug methotrexate, which destroy meningeal lymphoblastic cells that otherwise would lead to a recurrence of the disease. Investigators who have evaluated the functioning of children with ALL have focused on the impact of these therapies, both during and after the period of treatment.

One of the first groups of investigators to look at this problem was that of Soni, Marten, Pitner, Duenas, and Powazek (1975), who compared the neuropsychological functioning of children being treated for ALL by cranial (or cra-



niospinal) radiation with that of young patients receiving noncranial radiation for the treatment of tumors. The intellectual, visuospatial, and visuomotor functioning of experimental and control subjects were measured at 4–6 weeks, 6 months, and 1 and 2 years after the initiation of treatment. The only significant group differences that these investigators reported was that the children with tumors improved in their Wechsler Intelligence Scale for Children (WISC) or Wechsler Adult Intelligence Scale (WAIS) Performance IQ, whereas the ALL children did not. The authors suggested that perhaps the ALL children were not as able to benefit from repeated testing as the control subjects. However, as the ALL children's PIQs were consistently higher than those of the control subjects at each of the three evaluations, such a conclusion is probably unwarranted at this time.

Soni *et al.* (1975) also looked at the cognitive functioning of ALL patients treated with craniospinal irradiation and chemotherapy versus those receiving only chemotherapy. They tested their subjects two years after termination of the radiation therapy, and again, no significant differences in group performance emerged on either the cognitive or the perceptual tests. The authors concluded that prophylactic cranial or craniospinal irradiation has no identifiable adverse effects on neuropsychological functioning for up to two years following treatment.

Most other investigators have confirmed the above findings, examining a variety of variables and concluding that irradiation has no significant effect on the cognitive functioning of children with ALL (Berg, Ch'ien, Bowman, Ochs, Lancaster, Goff, & Anderson, 1983; Berg, Ch'ien, Lancaster, Williams, & Cummins, 1983; Moehle, Berg, Ch'ien, & Lancaster, 1983; Obetz, Smithson, Groover, Houser, Klass, Ivnik, Colligan, Gilchrist, & Burgert, 1979; Tamaroff, Miller, Murphy, Salwen, Ghavimi, & Nir, 1982). Some contradictory findings (Eiser, 1978; Goff, Anderson, & Cooper, 1980; Meadows, Massari, Fergusson, Gordon, Littman, & Moss, 1981) have, however, been reported. In these latter studies, the performance differences appear to reflect either the effects of age or difficulties that the subjects had in exercising highly specific cognitive skills. Ivnik, Colligan, Obetz, and Smithson (1981) reported that children treated after the age of 6 showed more impairment than did children diagnosed, treated, or tested at a younger age. However, most other studies showed less impairment for older subjects.

Part of the difficulty in ascertaining the effect of age in these studies derives from the problems associated with testing very young children. Not only do different tests have to be used with younger than older children (e.g., Stanford-Binet vs. WISC or WAIS), but tests used with very young children tend to measure only global behaviors. Thus, attempts to assess mathematical reasoning, memory, or perceptual-motor skills may be limited by the nature of the available tests. In addition, younger children tend to have more variability in their responses. Consequently, the detection of subtle impairments is difficult, and the results obtained are less consistent.

Furthermore, because ALL is usually diagnosed and treated before the central nervous system has fully developed, it is difficult to predict or identify ALL's

impact on higher order cognitive processes (e.g., language, reasoning, and memory) because abnormal development, compensatory development, and recovery can be superimposed on each other. Hence, a child may have average skills because of the adaptability of the CNS, but impaired development may prevent him or her from reaching his or her full potential.

Finally, sample size and methods of statistical analysis are critical issues in studies like these. Small samples are likely to produce sampling error, and statistics based on group means are likely to obscure individual differences. Berg, Ch'ien, Bowman, *et al.* (1983) pointed out that, although there were no significant patterns of cerebral dysfunction with respect to IQ and academic achievement scores in their group of ALL subjects, 9 of their 20 subjects were judged to have a specific learning dysfunction. Although this finding does not seem to be critical in this particular study, as 6 of the 9 had a learning dysfunction at the time of the first testing, it does suggest that group statistics may not be the optimal way to investigate the impact of ALL on cognition in children.

In summary, no consistent pattern of cognitive deficits has been found in children with ALL who were treated with irradiation and/or chemotherapy. The results obtained to date should be viewed as tentative, as age effects, the use of small sample sizes, and reliance on group mean scores make the detection of subtle impairments difficult.

### *Sickle-Cell Anemia*

Sickle-cell anemia, first described in 1910, is a genetic disorder of the blood in which mutant hemoglobin molecules reduce the ability of the blood cells to function normally. Two forms of this disorder exist. The heterozygous form, otherwise known as *sickle-cell trait*, involves one normal gene (Hb A) and one abnormal gene (Hb S); the homozygous form, often called *sickle-cell disease*, involves two abnormal genes (Hb S). Both forms lead to anemia because the spleen destroys the abnormal cells so rapidly that the bone marrow cannot manufacture replacement cells at an equivalent rate. However, the resultant anemia may not cause problems of sufficient severity to generate clinical symptoms, and so the person may be asymptomatic. Clinical problems arise in homozygous sickle-cell disease when episodic crises occur in which the abnormal sickle-shaped cells occlude capillaries and cause tissue ischemia and compromised organ functioning. The list of medical complications possible in this disease is varied and includes jaundice, chronic leg ulcers, priapism, neurological disorders, and delayed maturation.

Sickle-cell anemia tends to occur in people of African and Mediterranean descent, although it has been identified in a significant number of individuals in the East Indies, South America, Jamaica, Southeast Asia, India, Malaysia, and Puerto Rico. Approximately 8% of black Americans have sickle-cell trait, and the incidence of sickle-cell disease may be as high as 1/400. Mortality rates for sickle-cell disease are sufficiently high so that the prevalence rate in the general population is much lower than the incidence rate, but persons with sickle-cell trait generally have a normal life expectancy. Sickle-cell trait may go undetected, but

persons with sickle-cell disease may show signs and symptoms by the sixth month of life.

Systematic study of the impact of this disorder on cognition in children is quite limited, but several studies (Ashcroft, Desai, Richardson, & Serjeant, 1976; Jackson & Ayres, 1974) have shown that academic achievement is not clearly affected in children with sickle-cell trait. McCormack, Scarr-Salapatek, Polesky, Thompson, Katz, and Barker (1975) used twins to study physical and intellectual development in black American children diagnosed as having sickle-cell trait. Of the eight measures of physical growth used in this study, skeletal bone age and three measures relating to muscular development and body weight were significantly lower in sickle-cell children than in their matched peers. There was also a tendency for normal children to score better than the trait carriers on most cognitive measures, although group differences were not significant. The reason for the use of twins in this study was somewhat unclear, as only 4 of the 170 twin pairs studied were discordant for sickle-cell trait. Thus, the actual number of experimental subjects for whom variables such as age, education, SES, and home environment were closely matched was quite limited, a finding leading the authors to conclude that the small sample size precluded making any inferences about the effects of sickle-cell trait on cognitive functioning.

The number of published studies in this area is quite small, so these findings are preliminary. Replication and further investigation, with attention given to issues of sample size and characteristics, age at testing, and cognitive functioning versus academic achievement, are necessary to provide valid information about how sickle-cell disorders affect cognition. The importance of this work, given the rate of incidence of sickle-cell anemia, cannot be underestimated.

### *Malnutrition*

Because the brain undergoes approximately 80% of its growth in the first three years of life, it is especially vulnerable to nutritional insult in early childhood. Brain growth is accomplished largely by protein synthesis; thus, abnormal CNS development can still occur in children who consume an adequate number of calories, but whose protein intake is inadequate. As the great majority of children in the world experience malnutrition, either because they get too little protein or because their caloric intake is too limited to meet body needs, the question of what impact malnutrition has on their development is an important one. Until recently, the main concern of investigators has been the physical survival of malnourished persons. With increased understanding of the pathophysiology of malnutrition and with improved methods of treatment, mortality rates have declined; thus, interest has shifted to the delineation of the long-term sequelae of this condition.

Many investigators have demonstrated decreased intellectual abilities in malnourished children (see Latham, 1974, and Grantham-McGregor, 1984, for comprehensive reviews), but the precise origins of the deficits remain unclear

because of the difficulties associated with isolating the specific effects of malnutrition. Malnutrition, more than many other chronic conditions, is correlated strongly with a variety of factors, such as socioeconomic status and education. Malnourished children almost invariably also experience poverty, live in crowded environments with substandard living conditions, and have parents of low intelligence and education, who give them little encouragement to succeed academically. Some types of malnourishment are associated with emotional changes, such as apathy and irritability, which reduce the child's motivation to attend to the environment. In severe cases, an encephalopathy may develop that includes Parkinsonian symptoms, disturbed psychomotor development, decreased motor-nerve-conduction velocity, abnormal EEG, stupor, and coma (Osuntokun, 1972).

Attempts to control for socioeconomic and demographic factors include matching malnourished subjects with well-nourished schoolmates, neighbors, or children who are in the same general socioeconomic class (Galler, Ramsey, & Solimano, 1984; Monckeberg, Tisler, Toro, Gattas, & Vega, 1972; Stoch, Smythe, Moodie, & Bradshaw, 1982). Despite these attempts at experimental control, *post hoc* analyses have indicated that significant differences still exist with respect to the physical and economic resources available to experimental and control subjects (Stoch & Smythe, 1967), with malnourished children having significantly fewer conveniences, such as refrigerators, electricity, TV, and running water in the home. They are exposed to greater crowding, and family income is significantly lower (Monckeberg *et al.*, 1972). In addition, there is a higher prevalence of unemployment, illegitimacy, alcoholism, separation, and divorce in the homes of malnourished children. The environment that produces malnourishment often consists of illiterate parents who have limited education and poor child-rearing skills (Latham, 1974). A higher prevalence of infectious and parasitic diseases, as well as a deficiency of intellectual stimulation, is also more likely to be characteristic of households containing malnourished children.

Therefore, unless the multitude of variables associated with home environment are controlled carefully, the specific effects of malnutrition cannot be determined easily. The use of well-nourished siblings as a comparison group attempts to achieve such control, but as such siblings are generally undernourished when compared with the general population, findings from these studies must be interpreted with caution. Birch, Pineiro, Alcalde, Toca, and Cravioto (1971) found that malnourished children, hospitalized before 30 months of age for insufficient protein intake, had significantly lower IQs than their non-hospitalized siblings. Hertzog, Birch, Richardson, and Tizard (1972) used siblings as well as unrelated classmates or neighbors to study the effects of severe malnutrition treated with hospitalization. Two significant findings emerged from this study:

First, it was found that the malnourished children had lower IQs than their well-nourished siblings, and that these siblings had lower IQs than the unrelated peers. However, it is not clear why the malnourished child and not his or her siblings was subjected to poor nutrition. Factors such as selective parental ne-

glect or abuse or changing family circumstances may have been responsible, in part, for the lower intellectual functioning in the malnourished children.

Second, no association was observed in this study between IQ level and the age at which the malnourished children were hospitalized for treatment. This latter finding contradicted earlier data indicating that children admitted to hospitals with severe malnutrition in the first six months of life had less complete convalescence than older children (Cravioto & Robles, 1965), and that the earlier treatment was initiated, the more effective it was in preventing cognitive deterioration (McKay, Sinisterra, McKay, Gomez, & Lloreda, 1978). The fact that the subjects may have stayed in the hospital for varying lengths of time may explain some of the variance in these studies, as prolonged hospital stays have been shown to have a significant detrimental effect on cognitive performance (Grantham-McGregor, Stewart, & Desai, 1980).

One way to study the impact of malnutrition independent of socioeconomic status is to investigate nutritional disorders involving a congenital etiology, such as pyloric stenosis or cystic fibrosis. In these latter conditions, infants are subjected to time-limited malnourishment that is not closely linked to environmental influences. Children with severe malnutrition secondary to cystic fibrosis have been reported to have a lower IQ during and immediately after recovery from this malnutrition; however, these decrements are not evident at 5 years of age (Lloyd-Still, Hurwitz, Wolff, & Shwachman, 1974). On the other hand, children who suffer from congenital hypertrophic pyloric stenosis have been found to exhibit poor auditory and visual memory and attentional capacities for up to 14 years after corrective surgery was performed (Klein, Forbes, & Nader, 1975). The different results obtained in these two studies may reflect the fact that only a few subtests of the Wechsler intelligence scale were given in the latter study, whereas only full-scale IQs were reported in the former study. It seems likely that scores on the individual subtests could reveal differences that might be obscured with the use of full-scale scores. Thus, although malnutrition in early childhood may not permanently affect overall cognitive function, it may lead to subtle deficits that can affect the child's ability to learn effectively.

Recovery from malnutrition may well be influenced by the chronicity of the undernutrition (as measured by deficit in height), rather than by its severity (as measured by wasting or the presence of edema). Children treated for malnutrition who were the same height as their well-nourished peers had higher IQs than did malnourished children with stunted growth (Richardson, 1979). In addition, long-term exposure to an enriched environment seems to lead to lasting gains in cognitive abilities (Grantham-McGregor, 1984; MyLien, Meyer, & Winick, 1977), a finding suggesting that the impact of malnutrition on intellect is governed by many complex factors.

Although research on the relationship between malnutrition and cognition suggests that malnutrition has a significant, lasting, negative effect on intellectual abilities, the complexity of the many variables associated with malnutrition and the plasticity of the central nervous system makes interpretation of the findings difficult. Malnutrition seems to be a critical, although singular, variable nested in a complex array of interrelated factors.

## *Hypothyroidism*

Circulating thyroid hormones influence the growth, differentiation, and metabolic homeostasis of tissues throughout the body. Adequate functioning of the thyroid gland is especially important during early development and maturation, as children with untreated congenital thyroid gland dysfunction may experience a wide range of cognitive and behavioral impairments, including mental retardation, lethargy or restlessness, and poor attention and concentration (MacFaul, Dorner, Brett, & Grant, 1978).

The development of diagnostic methods permitting early detection and treatment of hypothyroidism has been responsible for reducing the prevalence of negative sequelae of this disorder. Researchers have focused on the impairments that persist *despite* treatment, and on the effect of variables such as age at the time of diagnosis. In general, the findings indicate that diagnosis and treatment of congenital hypothyroidism before the third month of life prevent significant intellectual impairment (Klein, Meltzer, & Kenny, 1972; New England Congenital Hypothyroidism Collaborative, 1981), although some deterioration, particularly with regard to verbal functions, may occur over time (Rochiccioli, Roge, Alexandre, & Dutau, 1982).

The type of thyroid dysfunction (e.g., athyroidism, goiter, ectopic thyroid, or hypoplastic disease) is another important factor influencing outcome. Rovet, Westbrook, and Ehrlich (1984) assessed the impact of four types of thyroid dysfunction on cognition. Children who had various types of hypothyroidism were matched with healthy siblings to control for genetic, environmental, and demographic variables. In this study the hypothyroid subjects performed less well on tests of "nonverbal" intellectual capacities (e.g., performance IQ), and on tests of gross-motor and perceptual ability. The performance on tests of verbal ability was not significantly different between groups. Athyrotic children had lower IQs than those with goiter, ectopic thyroids, or hypoplastic disease, and all thyroid-diseased children except those with goiter had a lower performance than verbal IQ. Hence, nongoiterous hypothyroidism may lead to selective subtle impairment of nonverbal skills, whereas all types of hypothyroidism seem to result in psychomotor problems.

In addition to psychomotor problems, hypothyroid children in this latter study were judged to have problems with persistence, and they were more withdrawn in novel situations than were their siblings. Although these deficits are not striking, it is nonetheless possible that they may predispose these children to learning disabilities in school, despite the presence of average intelligence.

Rovet *et al.* (1984) also showed that the child's age at the time treatment was initiated had no statistically significant effect on intellectual function, regardless of the type of thyroid disorder. The ectopic thyroid and goiter groups had a slightly greater decrease in verbal IQ than performance IQ over time, whereas the athyrotic children exhibited a slight increase in these scores. The authors concluded that the cognitive deficits, even in cases of successfully treated hypothyroidism, may exert a detrimental effect on academic performance.

As with the research conducted on other medical conditions, there are several difficulties with these studies. Testing very young children limits the validity of the findings, especially when the evaluation is of complex behaviors or when comparisons are made with test results obtained from older children. Moreover, the use of small sample sizes militates against advancing generalizations, especially with respect to future academic success. Longitudinal studies are necessary to accurately ascertain the long-term sequelae of hypothyroidism, and replication of the findings reported in these studies is important.

### *Diabetes Mellitus*

Because the central nervous system cannot store energy for its own use, it is highly dependent on the glucose available to it from the blood. Thus, disorders such as diabetes mellitus that affect the body's ability to provide energy for its cells are likely to have a negative impact on cognitive functioning. The inability of the pancreas to produce and secrete insulin in adequate amounts results in poorly controlled blood glucose levels that do not meet the needs of the body and that may result in conditions such as hypoglycemia and ketoacidosis. Treatment generally involves the daily administration of insulin, as well as a careful monitoring of food intake. The administration of too much insulin can result in such a sharp decrease in blood glucose levels that an "insulin coma" results, as the brain cannot get sufficient amounts of glucose to maintain consciousness. In poorly controlled diabetes, certain degenerative disorders such as retinopathy, nephropathy, and peripheral neuropathy may develop, which, along with repeated fluctuations in blood glucose levels, may adversely affect cognitive function. In addition, if the onset of a condition such as diabetes occurs at an early age, while the central nervous system is still maturing, it is likely that impaired development may compound the adverse effects of this disorder on intellectual capabilities.

Although there have been numerous studies of the association between intelligence and diabetes, the results have not been consistent. The conflicting findings are probably due to a number of factors, including sampling bias. In an early study that incorporated careful sampling techniques, Brown (1938) found that a group of 60 diabetic children chosen for their representative demographic characteristics had a mean and median IQ equivalent to that of the general population.

Other studies have focused on the effect of age at onset of the disease. Most have found that children who contracted the disease before the age of 5 exhibited a decrement in intellectual functioning, compared to both their nondiseased siblings and national normative samples (Ack, Miller & Weil, 1961; Kubany, Danowski, & Moses, 1956). In one preliminary report, it was observed that all adolescents who had developed diabetes before the age of 3 were impaired on virtually all tests in a neuropsychological battery (Ryan, Vega, & Drash, 1981). Other investigators found more circumscribed deficits in visuospatial and perceptual motor tasks (Rovet, Ehrlich, Westbrook, & Walfish, 1982).

The severity of the disease, as measured by the number of serious episodes of hypoglycemia or ketoacidosis, has not been found to have a statistically

significant effect on intelligence even when the onset of diabetes was before the age of 5 (Ack *et al.*, 1961; Rovet *et al.*, 1982), although Ack *et al.* (1961) observed a trend that they felt might prove significant if a larger sample were used. In a subsequent study, Ryan, Vega, Longstreet, and Drash (1984) controlled for age and degree of recent metabolic control of the disease and found that diabetic subjects performed within normal limits on all tests of cognitive function, except those related to verbal intelligence, visuomotor coordination, and critical flicker threshold. The authors argued that variable glucose blood levels during testing might account for the performance deficits on these latter measures. However, Holmes, Hayford, Gonzalez, and Weydert (1983) controlled glucose levels through infusion methods and found that impairments were still present, although limited to timed-reaction tasks. Performance on tests of visual perception and perceptual-motor capacity was unaffected. Performance efficiency in solving mathematical problems and in reading was somewhat slowed, although accuracy was intact.

The conflicting findings in this area reflect the difficulty of studying a medical disease that, in addition to its chronic course, has daily fluctuations. The fact that diabetes adversely affects so many different body systems complicates this picture still further. In addition, the nature of the treatment involved necessarily differentiates diabetic children from their peers and may lead to social isolation or maladjustment that can artifactually compromise functioning. Investigation of the impact of diabetes on cognitive functioning in children requires careful consideration of all these factors.

### *Asthma*

Although asthma is the most common chronic pulmonary disease of children (Purcell & Weiss, 1970), little attention has been given to the systematic measurement of neuropsychological impairment resulting from this condition. Some evidence exists that severe attacks may cause transient hypoxia that can lead to brain damage (Bierman, Pierson, Shapiro, & Simons, 1975; Bogolovov & Aristova, 1973), but most assessment of such damage has been limited to educational achievement or noncognitive measures.

In one of the few studies to examine neuropsychological functioning associated with asthma, Dunleavy and Baade (1980) compared the performance of severely asthmatic children and normal controls on the Halstead-Reitan Neuropsychological Battery. They found significant differences on only the Trail Making Test, the Tactual Performance Test, and the WISC Mazes subtest. Despite the statistical significance of these observed differences, the number of asthmatic children who fit the authors' definition of neuropsychological impairment was relatively small. Furthermore, the dysfunction of the impaired asthmatic subjects was judged to be mild when compared with the test results of children with diagnosed brain damage resulting from a variety of causes (Boll, 1974). The authors concluded that it is possible that visualization and recall of spatial configurations, as well as planning and execution of visual and tactile motor tasks, may become selectively impaired in cases of severe asthma.

Little work has been done on the impact of variables such as the age of onset



of this disease, the severity of the disease process, or treatment factors. Asthma is often treated with the chronic administration of drugs that have CNS effects, and although Dunleavy and Baade's results suggest that medications do not have a differential impact on neuropsychological functioning, further study is needed in this area.

### *Renal Disease*

The development of organ transplantation in the past few years has permitted many individuals to regain productive, fulfilling lives after a debilitating, formerly fatal illness. Transplantation is generally performed during the end stage of the disease, and its success is determined by a multiplicity of factors that vary from patient to patient. Research issues in the area of kidney transplantation include not only those germane to the investigation of other chronic illnesses, but also those related to this unusual mode of treatment. Organ failure is a complex process that directly and indirectly affects other body systems in ways that are not easily assessed. Thus, investigators who study cognitive functioning before and after transplantation must consider a large number variables in order to draw reasonable conclusions about the impact of either the disease or the transplantation.

In the case of renal failure, deleterious effects on neurological development may occur as uremic toxicity develops (Geary, Fennell, Andriola, Gudat, Rodgers, & Richard, 1980). These complications can include myoclonus, athetoid movements, seizures, EEG abnormalities, and severe developmental regression. Clinical features and EEG abnormalities normally seen in adults with dialysis encephalopathy can occur in children before the initiation of dialysis, perhaps because of concurrent hyperparathyroidism (Baluarte, Gruskin, Hiner, Foley, & Grover, 1977; Geary *et al.*, 1980). The fact that such complications are not inherent in renal insufficiency illustrates the difficulty of identifying subjects who are clinically similar, despite a shared diagnosis. Both before and after transplantation, subjects may be differentially affected by their disease, with the result that assessments of cognitive function may reflect the degree to which complications have developed, rather than the consequences of the disease itself. Likewise, the need for extensive medication before and after transplantation introduces additional complexities that compromise the opportunity to study either the impact of the disease or the effects of the transplantation.

Rasbury, Fennell, and Morris (1983) studied the cognitive functioning of children with end-stage renal disease before and after successful kidney transplantation. They examined subjects who had kidney disease of varying etiologies (obstructive uropathy, dysplasia, congenital cystinosis, and Alport syndrome), testing them 7–14 days before the patients began dialysis, then retesting them one month after successful transplantation. An average of six months elapsed between the initial baseline testing and the testing at one month post-transplantation. The problems inherent in this technique were evident in two ways in this project. One was that the control group (public school students matched for age, sex, race, and intelligence) and the experimental group showed a practice effect from test to retest, making changes in scores difficult to interpret. The second problem was that, when the investigators again tested their

groups one year later (including several new subjects), changes in the scores were not consistent (Fennell, Rasbury, Fennell & Morris, 1984). Thus, the inclusion of additional subjects, which increased the age variation within the sample, reduced the number of tests on which the transplant group showed significant improvement one month after transplantation. One year later, the differences between the groups were minimal, a finding suggesting that the improvements in the scores reflected the effects of maturation and experience.

The authors concluded that successful transplantation may slow a downward trend in cognitive deterioration that accompanies kidney disease. However, because minimal differences were observed between the groups in all the testing periods, it is not clear whether end-stage renal disease exerts a strong deleterious effect on cognition. As the experimental group was necessarily more often absent from school and thus may have experienced more academic problems than the control group, it is possible that differential learning opportunities may be responsible for the inconsistent cognitive deficits observed. Further research is needed to separate the direct effects of the disease from educational and other extraneous factors that could account for such results.

## SUMMARY

Neuropsychological tests are among the most sensitive measures of cerebral dysfunction. Indeed, their discriminative accuracy is better than the EEG, angiogram, and clinical neurological evaluation. For cases involving a metabolic or biochemical disorder, neuropsychological procedures are more appropriate than computerized tomography scanning.

The issues and methods pertinent to the neuropsychological assessment of children were described. The limited number of studies and the contradictory findings reported make conclusions difficult to draw at this time. Indeed, many of the studies conducted to date must be viewed as tentative, inasmuch as the multiple biological and psychosocial factors make it difficult to delineate cause-and-effect relationships.

Despite the preliminary nature of the findings to date, investigations into the cognitive capacities of medically ill children are necessary and critical to the understanding of the effects of compromised cognition on other types of functioning, such as academic and vocational activities. It seems important that children suffering from a chronic disease obtain comprehensive medical management that also includes the monitoring of their cognitive and behavioral development. As a result, cognitive habilitation procedures can be implemented, if required, that can augment the child's overall potential for maximal development of his or her capabilities.

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