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FOCUS ON
ECONOMIC OUTCOMES IN LATER LIFE

Stephen Crystal, PhD
Dennis Shea, PhD
Volume Editors

K. Warner Schaie, PhD
Series Editor



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ANNUAL REVIEW of Gerontology and Geriatrics

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Focus On Economic Outcomes in Later Life: Public Policy, Health, and Cumulative Advantage

Stephen Crystal, PhD

Dennis Shea, PhD

Volume Editors

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Contributors

Deborah Carr, PhD

Department of Sociology
and Institute for Health
Health Care Policy, and
Aging Research
Rutgers University
New Brunswick, NJ

Stephen Crystal, PhD

Division on Aging
Institute for Health
Health Care Policy, and Aging
Research
Rutgers University
New Brunswick, NJ

Richard Disney, MA

Professor of Economics
University of Nottingham
Research Fellow of the
Institute for Fiscal Studies,
London and
Axia Economics

George Farkas, PhD

Department of Sociology
Population Research Institute
The Pennsylvania State University
University Park, PA

Vicki A. Freedman, Ph.D.

Director
Polisher Research Institute
Madlyn and Leonard Abramson
Center for Jewish Life
North Wales, PA

Richard W. Johnson, PhD

Senior Research Associate
The Urban Institute
Washington, D.C.

Annamaria Lusardi, PhD

Department of Economics
Dartmouth College
Hanover, NH

Angela M. O'Rand, PhD

Department of Sociology
Center for the Study of Aging and
Human Development
Duke University
Durham, NC

Usha Sambamoorthi, PhD

Division on Aging
Institute for Health, Health Care
Policy and Aging Research
Rutgers University
New Brunswick, NJ

Robert F. Schoeni

Senior Associate Research Scientist
Survey Research Center
Ford School of Public Policy
University of Michigan
Ann Arbor, MI

Dennis G. Shea, PhD

Pennsylvania State University
University Park, PA

Jonathan Skinner, PhD

Joint French Professor of
Economics
Dartmouth College
Community and Family Medicine
Dartmouth Medical School
Hanover, NH
National Bureau of Economic
Research

James P. Smith, PhD

RAND Corporation
Santa Monica, CA

Steven Venti, PhD

Professor of Economics
and
National Bureau of Economic
Research Associate
Dartmouth College
Hanover, NH

Edward Whitehouse, MA

Director
University of New South Wales
And Axia Economics

Robert Wallace, MD

Department of Epidemiology
College of Public Health
University of Iowa
Iowa City, IA

Edward N. Wolff, PhD

Department of Economics
New York University and
Levy Economics Institute
of Bard College
New York

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and Paul Windley, PhD

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CHAPTER 1

Introduction Cumulative Advantage, Public Policy, and Late-Life Inequality

STEPHEN CRYSTAL

DIVISION ON AGING,

INSTITUTE FOR HEALTH, HEALTH CARE POLICY, AND AGING RESEARCH,
RUTGERS UNIVERSITY

DENNIS G. SHEA

PENNSYLVANIA STATE UNIVERSITY

Large and increasing shares of governmental revenues are devoted to retirement income programs and to other forms of assistance aimed at assuring adequacy of economic resources for older people. Yet despite the magnitude of the expenditures and the size of the stakes for the current and future elderly, and for society at large, much remains to be understood about the pattern of late-life economic outcomes, the factors that shape these outcomes, and the impact of public-policy choices on their distribution. This volume aims to contribute to a better understanding of these critically important issues. In particular, it seeks to bring together outstanding current scholarship on the complex dynamics that shape the pattern of economic outcomes in later life. Although the viewpoints in these papers are diverse, together they build toward a better understanding of the problem of retirement income adequacy, and the consequences of societal choices concerning retirement income systems.

WHAT DETERMINES LATE-LIFE ECONOMIC OUTCOMES?

For individuals, these outcomes are shaped by an enormously diverse set of life events, including occupational and labor-force participation histories;

health changes; marriage, divorce, and widowhood; and a host of other individual transitions in the lifecourse. One might, then, be tempted to suspect that life events produce a sort of "random walk" in which, as individuals age, their outcomes are less and less related to where they started from, and that increasing dispersion of economic circumstances with increasing age is an inherent consequence of the vicissitudes of life. However, both propositions are at best half-truths. Empirical analyses such as those in this collection illustrate the systematic aspects of the process, as well as the random aspects. Although not highly predictable for a given individual, outcomes are systematically related in the aggregate both to initial conditions and to public-policy choices that determine the structure of retirement income systems and in turn the economic consequences of life events.

Societal institutions interact with the economic, social and health histories of individuals over the lifecourse to produce the distribution of economic outcomes experienced by the older population, in ways that are complex but systematic (Crystal, 1995). Despite the passage of many intervening decades, early advantages remain highly determinative of average outcomes late in the lifecourse. For example, Crystal, Shea, and Krishnaswami (1992) found that the level of formal education attained, typically by the third decade of life, was more predictive of income after age 65 than before, despite the passage of many decades and numerous, individually unpredictable life events that affect economic well-being. And while life course events certainly cause individuals to move around within the income distribution over the years, the overall level of late-life income inequality varies systematically across countries with differing retirement income systems, as the paper by Whitehouse and Disney in this volume illustrates.

In understanding the processes that lead to late-life economic outcomes, a crucial and particularly challenging aspect concerns the role of health and functional status factors. The strong cross-sectional association between poor health and low income in old age is clear. The more challenging question—and a critical one in understanding the impact of policy choices—is to understand the longitudinal relationship between income and health status over the later lifecourse, the impact of early advantages and disadvantages on both, and the role of institutions such as social insurance in mediating these relationships. In order to understand these processes, we need to extend our focus from old age *per se* to midlife, the critical "launching pad" for late-life economic outcomes. Therefore, in addition to empirical papers on economic well being among elderly persons, we have included work on the way in which early advantages and disadvantages pervasively shape both health and economic status at midlife.

During the past two decades, scholarly views of late-life economic well being have undergone considerable evolution, shaped both by

methodological and empirical developments and by theoretical work. Methodologically and empirically, particularly important has been the increased recognition of inadequacies and biases, especially affecting the older population, in survey data sources typically used as the source for income statistics. These issues have been addressed both through more-sophisticated approaches to analyzing and adjusting such data and reconciling them with independent sources of macro-level data, and through improvements in the design of surveys, such as the "bracketing" techniques introduced in the 1990s in the Health and Retirement Study and the high-income oversamples introduced by the Federal Reserve in its Survey of Consumer Finances (Curtin, Juster, & Morgan, 1989; Juster & Smith, 1997). Methodological progress has also encompassed approaches that, rather than focusing solely on income, incorporate multiple dimensions of economic well-being, including wealth and in-kind resources, and that utilize multiple measures of distribution, including broad measures such as the Gini coefficient as well as narrower measures such as the proportion below poverty or other cutoff points. Edward Wolff and James Smith are among those represented in this volume who have contributed to these methodological developments over the years. Methodological choices turn out to make very major differences in estimates of the size and distribution of late-life economic well-being. Taken together, methodological and empirical developments in assessing late-life economic well-being have during recent years led to substantial revisions in thinking about these important issues.

Along with methodological and empirical developments have come new conceptual frameworks for thinking about the processes leading to late-life outcomes, and different ways of characterizing that pattern of outcomes. Considerable controversy continues about these issues, since a vast array of determinants affect outcomes and different analytic approaches produce different results. In the United States, some, such as Victor Fuchs (1984), have argued that the pattern of outcomes reflects a "leveling" process, as pre-retirement sources of income, largely from the employment market, are replaced by a mix of sources more dominated by income from social insurance programs, such as Social Security pensions. Others, such as Henretta and Campbell (1976), have argued that the process is best characterized as one of "status maintenance," with pre-retirement relative economic status replicated in post-retirement income, through retirement income systems that tend to track pre-retirement income.

Finally, noting an apparent increase in economic inequality after retirement age, particularly when methodological issues such as underreporting of unearned income in survey data are addressed, Crystal and Shea used the term "cumulative advantage and disadvantage" to characterize

some of the processes at work, a term which has since been used by a number of others in the gerontological literature. This notion also drew on analyses of old-age policies that noted the ways in which they contribute to late-life inequality and tend to produce "two worlds of aging" (Crystal, 1982). The basic underlying idea is, of course, one of long standing that has been used more broadly for many years in sociological research and in popular parlance (i.e., in simplistic form, the idea that "the rich get richer and the poor get poorer"). As Angela O'Rand points out, for example, the sociologist Robert Merton used the notion of cumulative advantage in the 1960s to characterize the way in which disparities in scientific productivity become magnified over the course of scientific careers. The paper in this volume by O'Rand provides background on the idea of cumulative advantage and the way in which it has more recently been brought into gerontological scholarship and applied to the issue of late-life economic inequality.

THE ECONOMIC STATUS OF CURRENT AND FUTURE ELDERLY

The volume then turns to a series of empirically based papers that, in combination, provide an outstanding and solidly based synthesis of current knowledge on the economic status of the current elderly, and of the retirement income prospects for the cohorts that will make up the elderly population in years to come. These papers provide essential information on the size and distribution of economic resources in the elderly population, both in the United States and in other economically advanced countries. Most important, they provide an enlightening perspective on the processes that lead to these outcomes, both at the level of individual life-course events on the one hand, and societal institutions and public policy on the other.

The paper by Wolff provides some of the most current available data on the economic well-being of the elderly and pre-retirement age groups in the United States, providing an analysis in terms of both income and wealth over the period from 1983 to 1998. Going beyond the focus on money income alone that still prevails in much published work, Wolff's paper builds on his past work on incorporating wealth into analyses of late-life well-being, including the addition of estimates of both pension and social security wealth to the analysis of well-being. Wolff bases his analysis largely on data from the Survey of Consumer Finances, which contains the most detailed information available on wealth and which goes to great lengths to represent the difficult-to-sample highest-income stratum of the population.

Wolff's results provide some of the first published information on changes during the economic expansion and stock-market boom of the middle to late 1990s. Using two measures of retirement wealth, he finds that both measures actually deteriorated for the near-elderly (ages 47 to 64) over the 1983–1998 period, though both did improve somewhat for the elderly (ages 65 and over). He also finds that non-whites continued to be much worse off than whites, although they appeared to be catching up slowly during this period; that singles continued to be much worse off than married couples; and that renters were much worse off than homeowners, with their relative position actually deteriorating.

CROSS-NATIONAL PERSPECTIVES

Disney and Whitehouse extend the perspective provided by Wolff to a cross-national view of late-life economic well-being across industrialized countries, examining replacement rates, poverty, and inequality, and focusing on those over age 65. Across 15 countries, they find the average replacement rate for older persons to be 83%—highest in North America and lowest in a few of the Nordic nations. In terms of replacement rates, single women tend to do worse than married couples, while single men fare better, though this does vary across the nations. In addition, in all nations except for Australia, replacement rates were found to decline for the oldest. In addition to this snapshot, Disney and Whitehouse examine trends up to the mid-1990s. Their cross-national analysis offers a generally encouraging scenario for the elderly, reporting that in the majority of the countries examined, incomes of the old rose faster than those of the population as a whole. Overall, they conclude that for most countries, the trend of rising economic well-being of the elderly in industrialized nations, which was previously documented through the 1970s, continued largely unabated through the 1980s and 1990s (although several countries went against the trend).

Poverty, as the authors show, is difficult to compare across nations. However, using several measures (principally the proportion below half of all-ages median income), they show that when one focuses on poverty, one often finds a different picture than the one that emerges from a focus on average replacement rates as a measure of income adequacy. Several nations that show high replacement rates, for example, also show high levels of poverty among the old. Egalitarian systems tend to minimize the differences between the generations, but, by some measures, leave many older persons still below poverty. Furthermore, even a simple methodological change, such as whether the poverty definition is defined as 40, 50, or 60% of the average income in the nation, can have large effects not

only (as expected) on estimates of the numbers of persons in poverty, but also on the ranking of the nation compared to others.

Income inequality across nations, as measured by the ratio of the income of persons at the 90th percentile to that of persons at the 10th percentile, showed wide variation, with the United States, Greece, France, Germany, and Italy having the greatest inequality. Nations with lower inequality also tended to have lower replacement rates. These differences in inequality, like the differences in replacement rates and poverty, stem from structures of public pensions, structures of the employment system, and, Disney and Whitehouse argue, from the way in which private plans and systems respond to the public features.

IMPROVING MEASUREMENT OF ECONOMIC WELL-BEING

As discussed above, methodological choices turn out to make very major differences in estimates of the size and distribution of late-life economic well-being. The chapter by James Smith, who is among the researchers who has made important contributions in this area, reviews some of these methodological issues, summarizing recent evidence from studies such as the Health and Retirement Study and the Asset and Health Dynamics of the Oldest Old. He further illustrates the meaning of these findings for studies of economic inequality and the connections between economic well-being and health.

Smith shows that five simple, yet important, techniques can have huge effects on accurate survey estimation of wealth and income of older persons. These five techniques—bracketing, anchoring, call-backs, integration, and periodicity—have all been tested and evaluated in recent studies and offer reliable, yet low-cost ways of improving data collection and providing more accurate estimates of inequality. Smith shows how bracketing and anchoring can improve upon previous underestimates of inequality in wealth data, while also showing how estimates that ignore important sources of wealth, such as Social Security, can over-estimate inequality.

Smith also shows that commonly used measures of income found in health surveys, such as a single question on total household income, can lead to serious errors in modeling the relationship between income and health. His point, that good research on the connections between health and economic well-being must rest on good data about both, challenges survey researchers who ignore either one in their efforts.

PENSION WEALTH

A key structural feature of the U.S. retirement income system is its extensive reliance on private rather than public pensions, with private pensions (along with investment income) accounting for a larger proportion of retirement income than in many other industrialized countries (Crystal, 1995). Private pensions, particularly the traditional defined-benefit programs, raise significant issues of equity and inequality. Coverage is better for skilled, technical, professional and managerial positions, especially those in large companies, than for less-skilled positions and those in smaller companies. In addition, vesting requirements (waiting periods before rights to benefits become "vested") work to the disadvantage of those who move in and out of the labor force or from position to position, which can be problematic for women in particular (Crystal, 1982). Thus, gender differences in amount of pension income received or in future pension entitlements ("pension wealth") have often been the focus of attention, particularly with respect to the future prospects of baby-boom men and women.

The paper by Johnson, Sambamoorthi and Crystal in this volume addresses this issue. These authors compare employer pension income for retired men and women and pension wealth for employed men and women approaching retirement. Among older adults with pension income in 2000, they find, women received only 54% as much private pension and annuity income as men. Among full-time wage and salary workers aged 51 to 61 in 1992 with pension coverage, median pension wealth on the current job was 76% greater for men than women. However, differences in wages, years of job tenure, and industry between men and women accounted for most of the gender gap in pension wealth on the current job. Less than one-third of the wealth difference could not be explained by gender differences in job characteristics, education, or demographics. The less-advantaged employment situation of working women currently in midlife carries over into worse retirement income prospects. However, they conclude, the gender gap in pensions is likely to narrow in the future as married women's employment experiences increasingly resemble men's.

EARLY ADVANTAGES, HUMAN CAPITAL, AND LATER-LIFE WELL-BEING

Two chapters in the volume shed light on the processes that shape later-life well-being by focusing specifically on the impact of experiences that take place early in the lifecourse, particularly formal education, on later-life outcomes. These papers extend the volume's scope to a broader

examination of lifecourse trajectories than is found in much gerontological research. Just as educational attainment has been shown by much research to have a surprisingly large association with health-related events later in the lifecourse, it also has a surprisingly large association with late-life economic outcomes. The papers in this volume begin to provide insight into the complex pathways by which this takes place.

In his paper, Farkas describes how three types of capital—human, social, and cultural—combine through the life cycle to generate late-life inequality. Each of the three represents a type of resource that families can make available to children, in the form of education and training, skills and habits, and social networks.

While the general notion that greater education increases pay and benefits is fundamental to the idea of cumulative advantage, Farkas discusses how education also increases social and cultural capital, thus increasing psychological resources, healthy lifestyles, functional abilities, and perceived well-being. He relates education not only to work opportunities, but to marriage choices and social networks. He also summarizes the evidence on the magnitude of these effects, suggesting that education has large effects not just on income and work, but on health lifestyles and sense of control (where college graduates score twice as high as high school dropouts). Furthermore, he shows that these differences, especially in health and functioning, grow as persons with differences in education age.

Farkas further notes that these tendencies towards late-life inequality are extended by the institutional structure that characterizes work and benefits in the U.S. Employers “back-load” compensation in order to retain workers, which means that many of the benefits of education and other early advantages appear late in life as these compensation schemes become active. Institutional changes, such as the decline of blue-collar jobs, with high wages and benefits, and the growth of the college premium in an information economy, also contribute to the growth in late-life inequality.

Carr offers a review that brings together several important, yet disparate, strands of the literature on well-being and aging. On the one hand, models of cumulative disadvantage have examined the increasing inequality in health and economic well-being that accompanies aging. On the other hand, we know that some people overcome the early disadvantages to achieve high levels of well-being in late life. Carr links these by focusing on studies that have addressed mid-life well-being, and further contributes to our understanding by addressing psychological aspects of health, rather than merely physical health.

In exploring the idea of “resiliency,” Carr highlights both the micro-processes of cumulative disadvantage and the ways in which these processes can be countered. Her additional consideration of the role of

depression raises new questions about the interaction between economic well-being and health in the life course.

HEALTH STATUS AND SOCIOECONOMIC STATUS IN LATE LIFE

Much research has documented the strong cross-sectional association between economic and health disadvantage in late life. Much less clear has been the nature of the longitudinal processes related to this correlation; simplistically stated, to what extent and in what ways do “the sick get poorer” versus “the poor get sicker”? A large literature, though mostly focusing on the working years rather than late life, has sought to examine the association between socioeconomic status and health, exploring a range of hypotheses, ranging from selection of healthier people into better jobs to effects of stress to differences in health-care access to differences in personal health behavior. There has been less research, however, on the SES-health relationship in late life, particularly in the years approaching death. The paper by Schoeni, Freedman, and Wallace offers a creative spin on this problem, studying a critical link between economic and health inequalities by investigating whether death is the great equalizer—more specifically, whether SES differences in health converge at the end of life.

These authors investigate whether advantaged and disadvantaged people die of similar causes but at older ages, or die of fundamentally different causes. Overall, about 40% of their sample have an activity limitation ten years prior to death, with this proportion increasing steadily up until a period of about one year before death. At that point, disability rises rapidly, although nearly one-third of persons are not limited in the last few months before death. The authors find that socioeconomic status differences in disability are present for people who are the same number of months away from death. The SES gap narrows as persons get closer to death if SES is measured by education or poverty, but widens for race. The authors conclude that the disadvantaged do not simply experience accelerated onset of death and the disabilities that precede it. Rather, those of disadvantaged socioeconomic backgrounds experience, before death, more years of disability and its accompanying physical, economic, and psychological consequences than is the case for those from advantaged backgrounds.

THE ECONOMIC FUTURE OF THE BABY BOOMERS

The demographic structure of the industrialized countries has been described by some as “a pig in a python,” as the large post-World War

II baby-boom cohort moves through the age structure. Much concern has been expressed about the retirement income prospects for this cohort, which experienced during its early working years an extended period of stagnation in wages, especially for those in less-skilled positions (Levy & Murnane, 1992). This caused some observers to express considerable pessimism over the retirement income prospects of the baby-boom cohorts, given an apparent extended setback in their income trajectories during their early working years relative to the experience of the preceding cohort.

In their chapter on the economic future of the baby boom generation, Johnson and Crystal explore the income trajectories experienced by members of this cohort as compared with those of immediately preceding cohorts (roughly speaking, their parents' generation). Generally, consistent with several other studies, they find that the income trajectories experienced by baby boomers demonstrate improvement over those of cohorts born 20 years earlier, although their estimates of the overall average improvement are somewhat smaller than those reported by these previous studies. They find that rates of household pension coverage have remained remarkably stable over time, since the decrease in pension coverage among men has been offset by the increase in pension coverage among women. They also find that rates of near poverty are lower for baby boomers than for their parents' generation. With respect to distributional outcomes, they find that income inequality at ages 40–45 generally remained fairly stable across cohorts, despite the well-documented rise in wage inequality during the 1980s.

While the change in overall adjusted mean-family income is encouraging, the authors conclude that other trends raise concerns. The improvement in mean adjusted family income resulted largely from increases in women's labor force participation and from reductions in family size. These analyses, like the other published studies comparing economic well-being of boomers and those of earlier cohorts, did not attempt to adjust for the increased work-related costs and decreased possibilities for domestic production in two-earner families, but these factors probably increase consumption needs. In any event, in terms of maintaining average family income, this strategy has about run its course. Because the vast majority of married women are now working outside of the home and family sizes are quite small in the most recent cohorts, future growth in adjusted family income must come from increases in wages. The findings also provide reason for concern about possible lower income mobility for boomers as compared with pre-boomers, which would imply that the capacity of persons who began life near the bottom of the income distribution to improve their relative eco-

conomic position may have diminished over time. Consequently, early life circumstances may be more important in the determination of retirement prospects in coming years than they have been in the past.

Johnson and Crystal find that some groups, such as those with less formal education, lagged behind in the general improvement in family income. They also explore the level of income inequality within pre-boomer and boomer cohorts as these cohorts age. Generally, the level of inequality among boomers and non-boomers at a given age appears to be similar, with inequality increasing steadily with age in each cohort studied. These results suggest that boomers, like the immediately preceding cohorts, are likely to experience high levels of inequality in their retirement years.

THE ROLE OF DIFFERENCES IN SAVING

The United States has undertaken numerous public policies in order to increase saving for retirement, yet many studies show continued lack of saving. As with many issues in the economics of aging, however, simple, widely cited statistics can be misleading. Both Wolff's paper and the paper by Lusardi, Skinner, and Venti shed light on this important issue, by addressing recent trends and future prospects for income, wealth, and saving among the elderly and those approaching age 65. Lusardi et al. also critically examine the validity of conventional measures of savings rates. Together, these papers suggest that common conventional wisdom that the elderly are saving too little for retirement is misguided, if one focuses on the average or typical person. Lusardi et al. show that the oft-cited evidence for undersaving—the massive decline in the savings rate—is largely explained by factors such as the vagaries of accounting for capital gains. Thus, the savings rate that receives so much attention in the popular press gives no real assistance in understanding the savings adequacy of the elderly.

However, these analyses also show that in a finer-grained analysis that goes beyond the average or typical person to vulnerable subgroups, there is continuing cause for concern about adequacy. Thus, for example, Wolff examines differences in accumulated wealth of different segments of the elderly population. His findings indicate that low or no wealth is a huge problem for Hispanic and African-American older persons, for those with little education, for single persons, and for those who rent rather than own. Wolff shows that disadvantaged groups made some strides in reducing the gap, but that for the most part the level of inequality in income and wealth remained large.

Similarly, Lusardi et al. show that while the wealth-to-income ratio tended to increase among the elderly, there are still a large number of elderly persons who have little to no savings whatsoever. These authors move the analysis from describing the data to suggesting some of the reasons for the low savings and wealth found among some groups. They outline the reasons why we might observe low savings rates, and divide them into some that might argue for government intervention and some that might not.

Overall, the papers by Lusardi, Wolff, Smith, and Disney suggest that the economic situation of the elderly has not changed significantly over the last decade or so, both by income and wealth yardsticks. They generally suggest that improvements in average economic well-being were generally maintained, or even expanded, during the 1990s (although Wolff's analysis suggests concerns about the near-elderly in the United States). As before, however, averages tell only a part of the story of economic well-being in old age. The more important and more interesting story has to do with diversity and inequality in the economic circumstances of elderly populations, its origins, and its implications for policy toward the aged. Whether considering fundamental reforms of Medicare, incremental prescription drug benefit expansions, pension regulation, or Social Security reform, the diversity in economic circumstances of the elderly challenges the creativity of policy-makers.

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CHAPTER 2

Cumulative Advantage Theory in Life Course Research

ANGELA M. O'RAND
DUKE UNIVERSITY

Individual self-selection and institutional social selection interact to affect successive probabilities of being variously located in the opportunity structure. . . . When the . . . role performance of individuals measures up to or conspicuously exceeds the standards of a particular institution or discipline—whether this be a matter of ability or of chance—there begins a process of cumulative advantage in which those individuals tend to acquire successively enlarged opportunities for advancing . . . (and the rewards that go with it) even further.

[Robert K. Merton, 1988, 616]

Robert K. Merton elaborates the cumulative advantage hypothesis above in an essay in 1988 that reflects on the diffusion of this theory, formally introduced twenty years earlier to explain inequality in science (Merton, 1968), to other stratification systems, including aging and the life course. The cumulative advantage hypothesis was adopted by life-course researchers because of two major factors. The first was theoretical. Human capital and status attainment theories, which had provided the dominant frameworks for examining the linkages between socioeconomic origins and socioeconomic outcomes in the life course, largely ignored random and institutional social selection processes alluded to by Merton that attach individual choices and destinies to normative allocation processes *over time*. Evidence of growing inequality within aging cohorts raised questions about seemingly multi-level processes of selection and causation leading to apparently ever-increasing unequal outcomes (e.g., Dannefer, 1988; Crystal & Shea, 1990a,b; Crystal, 1982).

The second motivation for adopting the cumulative advantage hypothesis in life course research was empirical. Longitudinal and cross-sectional

studies of economic inequality and health disparities over the life course and across cohorts were revealing recurrent but complex patterns of inequality in later life that suggested broader institutional processes not accommodated by the individualistic biases of human capital and status attainment theories. Economic inequality appeared to be highest among the elderly and appeared to be growing with age across succeeding cohorts (e.g., Easterlin, Macunovich, & Crimmins, 1993; Crystal & Waehrer, 1996). Also, research findings revealed mental and physical health disparities over the lifespan that were highly correlated with economic deprivation (House et al., 1990; Lynch, Kaplan, & Shema, 1997). Unequal origins and unequal outcomes in economic and health status were suspected to be connected via a "black box" of institutional processes, not readily captured in previous theories. The new question focused on "how" systemic processes selected and allocated individuals on the basis of status and performance *over time* in a way that led to more stratified fortunes in old age than at earlier phases of the life course.

Cumulative advantage theory provides the social allocation logic of life course inequality that is not intrinsic to individualistic self-selection theory. It argues that institutional processes that underlie achievement systems in the United States, i.e., educational, occupational, and related status hierarchies correlated with earnings, wealth and health over time, *preferentially* reward early levels of advantage and achievement—no matter their basis in ability, capacity, or chance—in the direction of privileging early higher advantage or performance in a process of accentuation over time. Time, itself, is the complex principal component of the system, to the extent that it inheres (or is embedded) in institutional arrangements that are associated with normative schedules of achievement, organizational time-clocks of advancement, and socioeconomic accounting/discounting regimes that cumulatively appreciate or depreciate earlier achievements (Hagestad & Neugarten, 1985; Henretta, 1992; Han & Moen, 1999; Elman & O'Rand, 2002b).

In the context of aging, time is also defined by human development trajectories of selection, optimization and compensation (Baltes & Baltes, 1990), which intersect with these institutional arrangements. Over the life course, individual lives are confronted by material, psycho-physical, and social constraints that orient and re-orient life pathways. Economic, health, personal, and social resources, which may be considered as forms of life course *capital* (O'Rand, 2001), accumulate or are depleted at variable rates and are exchanged as individuals optimize and compensate for basic human needs and wants. These pathways are selection sequences in which later status transitions across life domains are conditioned by earlier ones. Accordingly, aging research appears to provide the opportunity not only

to apply cumulative advantage theory but also to extend it to connect institutional and human development processes.

This essay was invited by the editors to consider this history and the implications of cumulative advantage theory for aging research. A brief history of the concept will be presented. Its emergence and development in aging research will be summarized, albeit with a selective literature review limited by space constraints. Then, the methodological demands of the theory and their implications for future research on the life course will be considered.

CUMULATIVE DIS/ADVANTAGE: FROM MIDDLE-RANGE TO MULTI-LEVEL THEORY

The origins of the broad cumulative advantage idea that was later adapted by aging researchers to explain later-life distributional outcomes are well known. Robert K. Merton (1968) introduced the "Matthew Effect" to the sociology of science as a middle-range framework for explaining the highly skewed system of productivity and recognition in the sciences being reported by many scholars at that time (see Zuckerman, 1988 for the most comprehensive summary of this literature and that which followed it). The majority of publications and rewards in science went to a very small minority. A key observation by Merton was that the "stimulus value" of the work of established scientists is greater than that for more obscure scientists, as evaluated by the peer system. That is, reputation operates as a "signal" that appreciates the value of the work done by established outstanding scientists relative to that of scientists with lesser (include younger) reputations. Stimulus value thus cumulatively increases over time to the relative advantage of the most advantaged—the rich get richer at a rate that makes the poor get poorer—and deepens the concentration of resources among the few in a classic process of Mertonian self-fulfilling prophesy.

Another element of this argument is the "institutionalized bias in favor of precocity" (Merton, 1988) or the selection effect of early achievements.—Earlier achievements by individuals that "measure up to or conspicuously exceed the standards" of a system (Merton, 1988, 616) anchor the cumulative distribution of subsequent advantage. As such, stimulus value is set early in the life course and operates as a "signal" in the social process of evaluation and reward over time. Early achievements determine later rates of appreciation or depreciation of individual achievements and operate in favor of higher accomplishments at the beginning that initiate a pattern of bifurcation, wherein the richer get richer and the poorer get poorer with opposite slopes of change that result ultimately

in the earlier attrition of the poor and the increasing concentration of the rich over time.

Notably, the most sophisticated empirical analyses of this process in science produced mixed results. An early longitudinal simulation of cross-sectional data on a large sample of natural scientists found increased inequality over time in publications and citations of scientists within synthetic age cohorts (Allison & Stewart, 1974). However, a later longitudinal study of real age-cohorts of chemists and biochemists did not find the same increased inequality over time (Allison, Long, & Krauze, 1982). Instead, this study challenged two important assumptions of the original simulation: the first that all scientists had equal propensities to publish over time, and the second that the rate of reward for publication was uniform over time. The implications of these findings were reported as follows:

For a stochastic model of productivity, we showed that a homogeneous rate of accumulation would not lead to increasing inequality but a heterogeneous rate would produce increasing inequality. This is much easier to show for the effect on interest rates on wealth accumulation. Specifically, it can be shown that a uniform rate of compound interest will not produce increased inequality even with great heterogeneity in initial investments. On the other hand, heterogeneity in interest rates will lead to increasing inequality of wealth over time. Moreover, the rate of increase in inequality will be faster if initial investments and interest rates are correlated. Of course interest rates are only a small part of the picture of wealth accumulation, but this example does point out the possibility of a general approach to accumulation processes that could be applied to many areas of social life (Allison, Long, & Krauze, 1982: 623).

When applied to broader areas of social life such as the life course, these observations suggest that selection effects (observable as initial achievements/statuses in the life course) are not deterministic of outcomes. Rather, at minimum, they interact with institutional processes (e.g., interest rates) over time to produce inequality, and the greater the variability and heterogeneity of interest rates, the greater the inequality. When initial statuses are highly correlated with institutional biases (let's say, as in the correlation between ethnic minority status, educational attainment, and wage returns to education; see Elman & O'Rand, 2002b), then inequality increases at a faster rate.

A final study in the sociology of science introduced another, related insight. Cole and Singer (1991) addressed what they termed the "productivity puzzle" in the sciences. This puzzle relates to how early small differences in status and achievement between men and women in science have large cumulative effects over the career. They propose the *theory of*

limited difference to explain this systemic process in which small differences accumulate over time to produce widely disparate outcomes. Small initial differences develop into wide disparities as higher achievements receive higher rewards that grow in value, and lower achievements receive lower rewards and decline in value.

Cumulative Advantage in the Life Course: A Multilevel Process

The selection effects and institutional processes operating over the life course are numerous and complex; they span multiple domains of life ranging from family to education, work and health. The potential variability of selection and institutional effects across these domains—and their nontrivial interdependence over time—render the original formulation of cumulative advantage theory in science as heuristic, although perhaps somewhat simplistic given the complexity of human lives and the social structures and historical conditions that influence them.

Selection Effects

Life course research often focuses on baseline inequalities, outcome inequalities, and the mechanisms that link them. Most studies examine individual-level selection processes. Economic and health disparities over the life course are perhaps the most fruitful areas in which selection processes have been observed. Stephen Crystal and his colleagues initiated a body of empirical studies of income inequality in old age, introducing into the gerontological literature an empirical application of “cumulative advantage and disadvantage” to characterize the process by which effects of initial advantages, such as differential educational attainment, interact with societal institutions such as retirement income systems to produce high levels of late-life inequality. Dannefer (1987) also used Merton’s term “Matthew effect” in a related effort to describe patterns of intracohort variability in aging research.

Crystal (1982) had examined the structure and distributional impact of retirement income systems and other public policies for the elderly in the United States, concluding that the net impact of these policies was to contribute to a pattern of high late-life inequality which he labeled “the two worlds of aging.” Following up on this work, Crystal and Shea initiated a series of empirical investigations of income distribution among the U.S. elderly. First, using data from the 1984 panel of the Survey of Income and Program Participation (SIPP), Crystal and Shea (1990a,b) examined income inequality across age groups (using Gini coefficients) and found the highest levels of inequality among the elderly. Even the groups above age 65, who might have reflected the “leveling” effects of

a redistributive Social Security system, were found to be progressively more unequal than their younger counterparts. Studies by other scholars using different datasets and comparing different cohorts largely replicate these findings about the U.S. elderly (e.g., Easterlin, Mucunovich, & Crimmins, 1993; Gottschalk & Smeeding, 1997; Crystal, 1995 for review; O'Rand, 1996 for review).

The sources of these observed inequalities were examined further by Crystal, Shea, and Krishnaswami (1992). Educational attainment, occupational history, age-group and race-ethnicity were used to predict components of income (Social Security, pension income, other income, and annuitized wealth) and total adjusted income. Notable among their results were the strong and undiminished effects of educational attainment on retirement income, and especially on the non-Social Security components of retirement income.

Later, using longitudinal data, Crystal and Waehrer (1996) observed the same pattern of increased inequality. In the latter study they compared three five-year cohorts from the National Longitudinal Survey of Older Men (NLSOM) over a fifteen-year period. They used a "bootstrap resampling method" to estimate Gini coefficients across waves and to test the significance of differences across waves. They also calculated income inequality using other measures including the coefficient of variation and inter-quartile comparisons. They found that income inequality increased with age in each cohort, even after controlling for compositional effects such as disproportionate mortality. They also observe complex patterns of economic mobility within cohorts that revealed the impact of adverse life events in deflecting and derailing earlier cumulative patterns. The same people are not always at the bottom or the top of the distribution across observations. They conclude that earlier economic inequality tied to retirement savings (especially earnings and pensions) is not "leveled" significantly by the transition to retirement and that aged inequality is produced both by cumulative and short-term factors.

These studies provide provocative support for two components of cumulative advantage theory and point to the significance of one mechanism of cumulative advantage. First, the replication in cross-sectional and longitudinal data of growing income inequality within cohorts after controlling for compositional effects implicates temporal processes that follow complex pathways: some are cumulative over the long-term, and some are more proximately associated with adverse events in later life. Second, the enduring effects of educational attainment provide evidence of the force of selection effects (particularly educational attainment) early in the life course on later outcomes.

The anchoring effects of education. The highly education-dependent income outcomes among the elderly found by Crystal and Waehrer (1996)

are repeated across studies of wealth and health outcomes in old age (e.g., House, Kessler, Herzog, Mero, Kinney, & Breslow, 1990; Deaton & Paxson, 1998). Educational attainment is positively associated with health and wealth in later life and, on average, these effects persist after controlling for intervening occupation, income, family and health transitions. These robust correlations invite much speculation about the mechanisms through which education operates to affect late-life outcomes.

The anchoring effects of education are illustrated in a study by Ross and Wu (1995), who employ cross-sectional and longitudinal data to explain the links between education and (self-reported) health. They argue that educational attainment is the anchor point of several cumulative pathways in the individual life course that ultimately affect late-life self-assessments of health. I have characterized these three pathways as three interlocking trajectories of life course *capital* (O'Rand 2001): (1) as human capital that influences employment history, job satisfaction, and income; (2) as social capital that enhances higher levels of social integration and social support; and (3) as personal capital that operates through healthier lifestyles and a greater sense of efficacy and personal control, (see also the chapter by Farkas in this volume for a related discussion). The accumulation of human, social, and personal capital over the life course is anchored in early educational attainment and develops as a product of intertwining and reinforcing processes to the relative benefit of the most advantaged over time (O'Rand, 2001).

This observation is supported by the results of the paper by Deborah Carr in this volume. Carr reviews findings from a study employing the Wisconsin Longitudinal Study, which follows a panel of Wisconsin High School graduates from the age of 18 (1957) to their early 50s (in 1992–93). The effects of SES resources in childhood on midlife health can operate directly or indirectly. However, even more critical are the findings that the relative effects of early life-course socioeconomic status for persons in different midlife health statuses (e.g., high blood pressure versus depression) can vary and that intervening and/or contemporaneous events can be more important for some midlife conditions.

The mediating effects of education. Educational attainment can mediate the effects of adverse early life conditions, which themselves have been found to have significant long-term effects on health, longevity, and wealth (Preston & Elo, 1992; Haveman & Wolfe, 1995). Childhood socioeconomic adversity, which is indicated by low parental SES, non-intact family of origin, welfare receipt as a child, and/or poor health prior to adulthood, has enduring effects over mid- and late-life outcomes, including risks for aged poverty and earlier mortality. In the absence of higher educational attainment, childhood adversity anchors lifelong economic hardship (Lynch, Kaplan, & Shema, 1997) following a pattern of cumulative hardship. The

lingering effects of childhood adversity, in the absence of higher educational attainment, have been documented by Elman and O'Rand (2002) in a study using the National Survey of Families and Households (NSFH) of the effects of early and delayed patterns of educational attainment on midlife wages. The study identifies three major education pathways to midlife wage outcomes. Early high achievers in education (those on the fast track), on average, come from advantaged social origins. "Late bloomers," who interrupt but later complete post-secondary educations, tend to come from less advantaged (but not truly disadvantaged) origins when compared to those on the fast track and do not exhibit the lingering effects of childhood adversity on wages. However, early low achievers who do not return to school for higher education come from disadvantaged origins that include childhood or adolescent ill health, which continue to exert significant negative effects on midlife wages after controlling for intervening adult transitions in work and family statuses.

Studies of economic status selection over the life course suggest that cumulative advantage/disadvantage processes do not generate a simple bifurcation of paths—rich richer and poor poorer. Early advantage grounds the life course in an upward trajectory of increased advantage, but moderating life events such as divorce, significant health decline and loss of a spouse can derail this process and precipitate declines in economic status. Alternatively, early disadvantage can block or retard the accumulation of economic advantages over time. But individual agency and chance opportunities can introduce resources to redirect the life course in a positive direction, while adverse life events can accelerate a downward slide. The pathways with disadvantaged origins thus can bend upwards, struggle to remain in place, or else move downward in spirals of cumulative hardship. This heterogeneity of these trajectories of inequality results from the interactions among multiple factors with economic status over time.

Health disparities over the life course. Along these lines, recent research on health disparities in the life course finds more evidence of the cumulative hardship hypothesis that goes beyond the education-wage relationship to account for the most marginalized pathways of disadvantage. A growing body of studies summarizes the processes by which the effects of sustained poverty ramify into self-reinforcing patterns of physical, cognitive, and psycho-social decline (e.g., Lynch, Kaplan, & Shema, 1997). These patterns have been observed in studies of race/ethnic differences in health, where early inequalities among children based on correlated SES origins and other social factors are linked to persistent poverty or lower social mobility, higher levels of disability, and higher rates of mortality across the lifespan among African-Americans (Williams, Mournay, & Warren, 1994; Smith & Kington, 1997).

The studies of racial inequality in health raise the issue of institutional effects on economic and health trajectories in the life course, since race is an institutional construct highly correlated with social class, residential and geographical location, and social integration. Recall the summary of Merton's argument about the "stimulus value" of early high status attainment (which I defined as social signaling), in which early educational attainment levels serve as social signals in structural selection processes that cumulatively allocate individuals into unequal positions. Race also lends itself to this argument. Race and educational origins allocate individuals across formative contexts, including marriage markets where assortative mating drives patterns of family formation, labor markets where educational credentials and skin color inform the assignment to jobs with variable wage and benefit structures, and health service markets where health insurance coverage and health-care delivery range between extraordinary formal care and limited (emergency) or non-existent health care, except for informal caregiving by family members.

Selection-optimization-compensation (S-O-C). Selection effects on inequality over the life course also include human development mechanisms that lead to adaptive and non-adaptive responses to economic and health conditions. Baltes and Baltes (1990 and in later publications) propose their S-O-C theory of successful aging to characterize individual-level processes, whereby diminishing physical and mental capacities in the aging process come to be managed with variable effectiveness across the population and lead to uneven outcomes. Their data from the Berlin Aging Study have identified how individuals differentially compensate for health declines or age-related disadvantages by selecting behaviors that optimize and reinforce their strengths and compensate for their weaknesses.

This schema is potentially generalizable across the life course to account for how individuals vary in their capacities to compensate for disadvantages and optimize their resources to achieve greater health or wealth. The extent to which all difficult economic and health obstacles are readily overcome by "successful aging" mechanisms is problematic, yet the S-O-C schema is useful. We know that in the absence of economic capital or good health, subgroups employ other forms of capital to compensate for disadvantages. Forms of social capital over the life course provide useful examples of this process. Social capital refers to the stock of direct and indirect relationships that can be mobilized to meet basic needs and wants. The extensive literature on social supports across the life course and their effects on economic mobility and health support grows daily, and has moved beyond the family and kin care-giving literatures to include the connection between religion and health (see Krause, 2001

for review; Ellison & Levin, 1998). Social supports can be compensatory mechanisms in economic mobility and in the aging process.

Institutional Effects

In addition to race, other social institutions associated with government, market and family (gender) structures influence patterns of inequality. Three categories of institutional effects will be reviewed here: normative schedules of achievement, organizational/institutional time-clocks of advancement, and community opportunity structures. In advanced industrial societies, the life course has, by and large, been regulated by normative schedules of achievement (Hagestad & Neugarten, 1985), although these institutions have varied significantly across societies (O'Rand & Henretta, 1998). Normative schedules have been associated with the age-graded timing of major life transitions, such as exits from schooling, job entry, job exit, and family formation. While these norms have become eroded by major demographic trends—such as prolonged and interrupted school completion, delayed marriage and fertility, and early or delayed retirement patterns—the persistence of the life-course premium placed on early educational attainment patterns for later life outcomes is notable. The norm of “precocity” in Merton's Matthew Effect operates in matters of wealth and health accumulation.

Early high attainments in education (especially baccalaureate completion within a cohort) initiate positive and steep trajectories of economic attainment (Elman & O'Rand, 2002). Early entrance into favored job markets facilitates wage and work-related benefit growth (pensions, health insurance) and the accumulation of assets, which in turn positively affect health and social integration. Early timing advantages workers in several ways: time at work enhances the compounding of returns for work in wages, pensions and wealth; time in the workplace expands social capital that may bring greater resources; and time (experience) carries stimulus value that appreciates the value of more experience relative to less experience. Slower educational completion or delayed entry into favored occupational settings retards these accumulation processes, and may even lead to penalties that depreciate these attainments.

Organizational/institutional time-clocks of advancement also regulate achievement over the life course. The case of educational achievement has been discussed. Time-clocks also regulate the work career through underlying mechanisms of tenure, promotion regimes, employee benefit eligibility, and retirement schedules (Henretta, 1992). A recent study of the multiple clocks of the working life-course directly examines the complexities of this process. Han and Moen (1999) study the individual and organizational careers of workers in a region in New York State. Using sequence analysis they monitor the multiple clocks that regulate workers'

lives. Individual work histories and organizational careers intersect in workers' lives and differentiate their fortunes and the timing of the end of their careers.

These work-related clocks are also synchronized with family careers. Women's work careers have traditionally been tightly synchronized with family careers. Delayed and interrupted patterns of work have slowed their progress towards wage and pension attainment and affected their retirement patterns and wealth levels following retirement and widowhood (O'Rand & Henretta, 1982; O'Rand & Landerman, 1984; O'Rand & Henretta, 1998). Alternatively, the extraordinary increase in women's educational attainments and in their lifetime work attachment patterns over the past two decades has increasingly re-synchronized their lives, leading to an increased tendency to constrain the family career in response to the work career via patterns of delayed marriage and fertility, or even divorce.

These new labor force patterns have also contributed to another trend that is increasing inequality in old age. Assortative mating, or the pattern by which couples of similar educational attainments and occupation aspirations marry, is increasing economic inequality across age-groups at the household level. Among the wealthiest subgroups of the aging population are married couples with higher levels of education and (sometimes) joint work careers (Gottschalk & Smeeding, 1997; Blau, 1998). These couples not only benefit from economic resources, but from social and personal resources that benefit late life health outcomes and general well-being (Waite & Gallagher, 2000).

The social insurance clocks attached to Social Security, retirement and disability benefits, and to Medicare and Medicaid, clearly regulate the fortunes and outcomes of the elderly. The most disadvantaged elderly depend exclusively on these public transfers; their labor exits and late-life economic statuses are defined by these benefits (Smith, 1997). They are also the most vulnerable populations to changes in these benefit structures, especially to changes in eligibility to later ages, since the employability and health statuses of these populations are disadvantaged.

Finally, community opportunity structures, including employment and wage opportunities, the qualities of residential neighborhoods, resources for educational nourishment, health care availability, and other forms of cultural capital, influence cumulative advantage processes. The surge in income inequality in advanced countries has raised concerns about the short-term and long-term implications of this trend for aging populations (Gottschalk & Smeeding, 1997). The wage premium of the baccalaureate degree ascended dramatically from the late 1980s to 2000. Changing labor market structures, like the impact of changing interest rates on wealth accumulation wealth, can alter the value of different kinds of work and introduce institutional forces that increase inequality (see the paper by

Johnson and Crystal in this volume). Compressed wages at one end and rapidly increasing wages at another are the key ingredients of current patterns of income dispersion.

Cross-national and cross-state comparisons of economic inequality and health disparities also identify regional and environmental sources of these outcomes (e.g., Wilkinson, 1995). Income dispersion is highly associated with health disparities such as variations in infant mortality, disabling disease and mortality, and with location, where extreme poverty tends to be isolated and concentrated. In the United States, rural-urban and state variations in economic and health inequality provide strong evidence of the institutional effects. Daly, Duncan, Kaplan, and Lynch (1998) linked the Compressed Mortality File maintained by the National Center for Health Statistics with decennial censuses for 1980 and 1990 and with the Panel Study of Income Dynamics (1978–1982; 1988–1992) to study the impact of income inequality on mortality. State-level mortality was highly associated with poverty; the deeper the poverty in a state, the higher was its mortality rate. These researchers argued that income inequality may operate not only through the relative availability of resources from the community, but also through persons' perceptions of relative deprivation leading to negative health outcomes including stress, morbidity and finally mortality.

In short, institutional effects operate through broader stratification norms, organizational/institutional rule structures and interdependencies, and community contexts to produce economic and health disparities, which develop along diverse trajectories over the life course. Small initial differences can develop over time into wide disparities; early wide disparities can become even wider over the life course, although compensatory processes do operate to mediate the effects of some initial inequalities. The systemic processes generated by these multilevel phenomena influence individual outcomes through:

1. The positive compounding or accumulation of economic status/health over time for those with early advantages and achievements: the race is to the swift;
2. The depreciation of economic status/health over time through cumulative hardship for those with early disadvantages and lower achievements. For health trajectories, early onset of poor health generates vulnerability to cumulative hardship;
3. Compensatory processes that provide safety nets from the consequences of adverse life events affecting economic status, and health and social supports for the personal management of these events.

Appreciation, depreciation and compensation are not merely individual selection processes, but multilevel phenomena that occur in real time. The

multilevel management of time is thus central to the cumulative advantage project in aging research.

METHODOLOGICAL DEMANDS OF THE THEORY

Finally, the methodological demands of cumulative advantage theory are attached to identifying the mechanisms that link origins to outcomes. These demands match those for aging research overall, although they are not always easily satisfied. Longitudinal data, time-sensitive analyses, multilevel and growth curve techniques and cross-context/cross-cohort comparisons are suited to the task at hand (Alwin & Campbell, 2001).

The treatment of time is also critical. Time proceeds chronologically and with the somatic aging processes, but it is also embedded in (1) the normative schedules and temporal rule structures of social institutions and organizations, (2) the timing and sequencing of life transitions in personal biographies, and (3) the histories of communities and nation-states. Longitudinal data permit the closer view of "real time" in persons' lives and the distinctive biographies that develop in response to institutional and human development factors. However, long unobserved periods in the life course between origins and destinations create a "black box" that masks individual and institutional selection processes through which cumulative advantage operates. These processes involve the dynamic interaction of individual choices, social circumstances, and historical events.

The temporal complexity of the life course makes problems of endogeneity nearly intractable. Selection and causation relationships between economic status and health preoccupy life course researchers. We know that these two phenomena are highly interdependent over the lifespan. We also know that initial statuses strongly predict late-life outcomes. But we are only beginning to understand the finer-grained transitions over the life course that produce specific outcomes or trajectories for subgroups of the population. Life transitions that intervene between early and later life statuses can moderate or mediate the effects of early conditions for specific outcomes. The ability to link individual transitions to broader contexts in real time is the ideal shared by researchers. Efforts in this direction now motivate many efforts to maintain longitudinal databases as long as it is feasible and to link these individual data to institutional records, socio-geographical locations, and historical events in order to track the multi-level phenomenon of aging.

CONCLUSIONS

The theory of cumulative advantage lends itself well to aging research. The aging process is characterized by increased differentiation and inequality

within cohorts. The relationship between inequality and time within cohorts is captured directly by this theory. Aging research focuses on origins and outcomes. Studies of economic inequality and health disparities within aging cohorts are providing fruitful observations of the processes of cumulative advantage/disadvantage that link origins and outcomes. Chief among these observations are that origins and destinations in the life course are linked by patterns of appreciation, depreciation and compensation of life course capital that are highly complex and interdependent with age. Early socioeconomic resources benefit from a process of appreciation over time, although adverse life events can reorient early pathways. Similarly, early economic hardship can be mediated or compensated for by the intervening accumulation of resources, especially education.

The theory is also relevant to the multi-level structure of the life course. Time is structurally embedded in developmental, normative, institutional, community and organizational arrangements. As such, personal biographies, institutional statuses, and organizational careers define the clocks that regulate individual lives. Research on aging is increasingly linking data that connect the particulars of individual lives to these institutional/organizational clocks. The integration of theories of human development and social stratification is thus coming more within our reach.

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CHAPTER 3

Income, Wealth, and Late-Life Inequality in the United States

EDWARD N. WOLFF
NEW YORK UNIVERSITY AND
LEVY ECONOMICS INSTITUTE OF BARD COLLEGE

This paper investigates the well-being of the elderly and pre-retirement age groups in terms of both income and wealth in the United States over the period from 1983 to 1998. It follows up the work on the wealth status of the elderly of Wolff (1996, 2001). One new contribution of this paper is that it adds estimates of both pension and social security wealth to the analysis of well-being. As a result, I look at four dimensions of well-being: (i) income, (ii) net worth, (iii) retirement wealth, and (iv) augmented wealth.

Three years, in particular, are analyzed: 1983, 1989, and 1998. These represent the years for which the Survey of Consumer Finances (SCF), which contains the most detailed information on household wealth, has provided such detail on pensions and Social Security. The calculations are performed for age groups near and at retirement age, spanning the age range 47 and over. Of particular interest is whether their resource base has improved or deteriorated over this period. Attention is also paid to trends for different demographic and groups, including divisions by age, gender, race/ethnicity, and marital status. A specific focus will be on how changes in the private pension systems have affected the level of retirement wealth.

I find that despite the proliferation of defined contribution plans at a time when the stock market experienced one of its longest bull runs in history, the well-being of the near-elderly and elderly did not improve generally. Indeed, median retirement wealth and median “augmented wealth” (the sum of traditional net worth and retirement wealth) actually deteriorated for the near-elderly (ages 47 to 64) over the 1983–1998 period, though both did improve somewhat for the elderly (ages 65 and over).

This is true despite a large shift in the composition of private retirement wealth away from defined benefit (DB) plans toward defined contribution (DC) plans. I also find that non-whites are much worse off than whites though non-whites appeared to be catching up, albeit slowly, with whites over this period. Likewise, singles are much worse off than married couples, though single males did gain on married couples over the 1983–1998 period, while single females showed no relative gain. Finally, renters are much worse off than home owners and the relative position of renters actually deteriorated over these years.

The remainder of the paper is organized as follows. First, we review some of the pertinent literature, particularly on retirement wealth. Then a description of the methodology and data sources follows. Results are presented next. Finally, concluding remarks are made.

LITERATURE REVIEW

A number of papers have presented estimates of Social Security and/or pension wealth. The seminal paper on this topic is Feldstein (1974), who introduced the concept of Social Security wealth and developed its methodology. His main interest was in the aggregate level of Social Security wealth and its effect on aggregate savings. In a follow-up paper, Feldstein (1976) considered the effects of Social Security wealth on the overall distribution of wealth. Using the 1962 Survey of Financial Characteristics of Consumers, he found that the inclusion of Social Security wealth had a major effect on lowering the overall inequality of (total) household wealth.

Wolff (1987) followed up Feldstein (1976) by examining the distributional implications of both Social Security and private pension wealth. Using the 1969 Measurement of Economic and Social Performance (MESP) database, he showed that while Social Security wealth had a pronounced equalizing effect on the distribution of augmented wealth, pension wealth was disequalizing. The sum of Social Security and pension wealth had, on net, an equalizing effect on the distribution of augmented wealth. Wolff (1992) addressed the methodological issues in estimating both Social Security and pension wealth. Wolff (1993) extended the estimates of Social Security and pension wealth to the 1962 SFCC and the 1983 Survey of Consumer Finances (SCF).

The most recent work on the effects of Social Security and pension wealth on the overall distribution of wealth is from Kennickell and Sundén (1999), who base their study on the 1989 and 1992 SCF. They also find a net equalizing effect from the inclusion of these two forms of retirement wealth. Interestingly, they find that there is a negative effect of both defined benefit plan coverage and Social Security wealth on non-pension

net worth but that the effect of defined contribution plans, such as 401(k) plans, is insignificant.

Several papers have now used the Health and Retirement Study (HRS). Gustman et al. (1997) found that in 1992, pensions, Social Security, and health insurance accounted for half of the wealth held by all households aged 51 to 61 in the HRS. In a follow-up study, Gustman and Steinmeier (1998) focused on the role of pensions in forming retirement wealth. They found that pension coverage is widespread, covering two thirds of households and accounting for one quarter of accumulated wealth on average for this age group. Social Security benefits accounted for another quarter of total wealth. They also reported that the ratio of wealth to lifetime earnings was the same for those individuals with pensions and for those without pensions. They concluded that pensions cause very limited displacement of other forms of wealth.

Several studies have documented changes in pension coverage in the United States, particularly the decline in DB pension coverage among workers over the last two decades. Kotlikoff and Smith (1983) showed that the proportion of United States private-wage and salary workers covered by pensions more than doubled between 1950 and 1979. Bloom and Freeman (1992), using Current Population Surveys (CPS) for 1979 and 1988, were among the first to call attention to the decline in DB pension coverage. They reported that the percentage of all workers in age group 25–64 covered by these plans fell from 63% to 57% over this period. Among male workers in this age group, the share covered dropped from 70% to 61%, while among females in the same age group, the share remained almost constant, at 53%.

A related topic of interest is whether DC pension plans have substituted for DB plans. Popke (1999), using employer data (5500 filings) for 1992, found that, indeed, DC plans have substituted for terminated DB plans and that offering a DC plan raises the chance of a termination in DB coverage. On the other hand, Poterba, Venti, and Wise (1998), using HRS data for 1993, found that the growth of 401(k) plans did not substitute for other forms of household wealth and, in fact, raised household net worth relative to what it would have been without these plans.

Several studies have looked at the overall economic status of the elderly. Crystal and Shea (1990), adjusting income for household size, underreporting of unearned income, and the annuitized value of assets, estimated that in 1984 the elderly were on average 124% as well off as the non-elderly. Hurd (1994) showed that the mean income of households aged 65 and over increased sharply between 1970 and 1975 but only moderately from 1975 to 1987. As a fraction of the overall mean household income, average elderly income rose from 54% in 1970 to 61% in 1975 and then to only 63% by 1987. Smith (1997), using 1994 HRS data, found that

median financial wealth among white households aged 70 and over was only \$15,600 and that among white households aged 51–61 was only \$23,400; and median financial wealth for black and Hispanic households in the two age groups was zero.

As is apparent from the above survey, there are no studies to date (at least as far as I am aware) that have looked at changes in the economic status of the elderly over the period 1983 to 1998—a period that is particularly notable for the switch over from DB to DC pension plans

DESCRIPTION OF THE METHODOLOGY AND DATA SOURCES

The study measures three main components comprising the resource or asset base of retirees' household wealth. The first is marketable wealth (or net worth) that is defined as the current value of all marketable or fungible assets less the current value of debts. This is the primary measure of wealth. The second is Social Security wealth, defined as the present value of expected future Social Security benefits. The third is pension wealth. This consists of two parts. The first of these is the value of defined contribution pension wealth. This is equal to the cash surrender value of pension plans, including IRAs, Keogh, and 401(k) plans. The second is the capitalized value of expected benefits from defined benefit pension plans.

The data sources used for this study are the 1983, 1989, and 1998 SCF conducted by the Federal Reserve Board. Each survey consists of a core representative sample combined with a high-income supplement. The supplement is drawn from the Internal Revenue Service's Statistics of Income data file. The advantage of the high-income supplement is that it provides a much "richer" sample of high income and, therefore, potentially very wealthy families. The SCF also has the advantage of providing exceptional detail on both assets and debt (several hundred questions are asked). Moreover, it provides considerable detail on both pension plans and Social Security contributions, as well as expected pension and Social Security benefits for both husband and wife. For 1983, the Federal Reserve Board has also made its own calculations of the wealth equivalent value of both expected pension benefits and Social Security benefits and made these available in its Public Use sample. However, this has not been done for the other years.

Marketable Wealth

The principal wealth concept used here is marketable wealth (or net worth), which is defined as the current value of all marketable or fungible assets less the current value of debts. Net worth is thus the difference in value

between total assets and total liabilities or debt. Total assets are defined as the sum of: (1) the gross value of owner-occupied housing; (2) other real estate; (3) cash and demand deposits; (4) time and savings deposits, certificates of deposit, and money market accounts; (5) government bonds, corporate bonds, foreign bonds, and other financial securities; (6) the cash surrender value of life insurance plans; (7) the cash surrender value of pension plans, including IRAs, Keogh, and 401(k) plans; (8) corporate stock and mutual funds; (9) net equity in unincorporated businesses; and (10) equity in trust funds. Total liabilities are the sum of: (1) mortgage debt, (2) consumer debt, including auto loans, and (3) other debt.

This measure reflects wealth as a store of value and therefore a source of potential consumption. The assumption is that this concept best reflects the level of well-being associated with a family's holdings. Thus, only assets that can be readily converted to cash (that is, "fungible" ones) are included. As a result, consumer durables, such as automobiles, televisions, furniture, household appliances, and the like, are excluded here since these items are not easily marketed or their resale value typically far understates the value of their consumption services to the household.

Pension Wealth

The imputation of both pension and Social Security wealth involves a large number of steps, which is summarized below. Greater details can be found in Wolff (2002). For retirees (r) the procedure is straightforward. Let PB be the pension benefit currently being received by the retiree. The SCF questionnaire indicates how many pension plans each spouse is involved in and what the expected (or current) pension benefit is. The SCF questionnaire also indicates whether the pension benefits remain fixed in nominal terms over time for a particular beneficiary or are indexed for inflation. In the case of the former, the (gross) pension wealth is given by:

$$(1a) \quad PW_r = \int_0^{\infty} PB(1 - m_t)e^{-\delta t} dt$$

where m_t is the mortality rate at time t conditional on age, gender, and race; δ the nominal discount rate, for which the (nominal) 10-year treasury bill rate is used; and the integration runs from the current year to age 109. In the latter case,

$$(1b) \quad PW_r = \int_0^{\infty} PB(1 - m_t)e^{-\delta^* t} dt$$

and δ^* is the real 10-year treasury bill rate, estimated as the current nominal rate less the Social Security Plan II-B assumption of 4.0% annual increase of the Consumer Price Index (CPI).

Among current workers (w) the procedure is somewhat more complex. The SCF provides detailed information on pension coverage among current workers, including the type of plan, the formula used to determine the benefit amount (for example, a fixed percentage of the average of the last five year's earnings), the retirement age when the benefits are effective, the likely retirement age of the worker, and vesting requirements. Information is provided not only for the current job (or jobs) of each spouse but for up to five past jobs as well. On the basis of the information provided in the SCF and on projected future earnings (see below for details), future expected pension benefits (EPB_w) are then projected to the year of retirement or the first year of eligibility for the pension. Then the present value of pension wealth for current workers (w) is given by:

$$(2) \quad PW_w = \int_{LR} EPB(1 - m_t)e^{-\delta t} dt$$

where RA is the expected age of retirement and $LR = A - RA$ is the number of years to retirement. As above, the integration runs from the expected age of retirement to age 109.¹

Social Security Wealth

For current Social Security beneficiaries (r), the procedure is again straightforward. Let SSB be the Social Security benefit currently being received by the retiree. Again, the SCF provides information for both husband and wife. Since Social Security benefits are indexed for inflation, Social Security wealth is given by:

$$(3) \quad SSW_r = \int_0 SSB(1 - m_t)e^{-\delta^* t} dt$$

where it is assumed that the current Social Security rules remain in effect indefinitely. Separate imputations are performed for husband and wife and an adjustment in the Social Security benefit is made for the surviving spouse.

The imputation of Social Security wealth among current workers is based on the worker's projected earnings history estimated by regression equation. Human capital earnings functions are estimated by gender, race, and schooling level. In particular, the sample is divided into sixteen groups by the following characteristics: (i) white and Asian versus African-American and Hispanic; (ii) male and female; and (iii) less than twelve years of schooling, twelve years of schooling, 13 to 15 years of schooling, and 16 or more years. For each group, an earnings equation is estimated as follows:

$$\text{Log}(E_i) = b_0 + b_1 \text{Log}(H_i) + b_2 X_i + b_3 X_i^2 + b_4 SE_i + \sum_j b_j \text{OCCUP}_{ij} + b_{10} \text{MAR}_i + b_{11} \text{AS}_i + \varepsilon_i,$$

where log is the natural logarithm; E_i is the current earnings of individual i ; H_i is annual hours worked in the current year; X_i is years of experience at current age (estimated as age minus years of schooling minus 5); SE_i is a dummy variable indicating whether the person is self-employed or working for someone else, OCCUP is a set of five dummy variables indicating occupation of employment ((a) professional and managerial; (b) technical, sales, or administrative support; (c) service; (d) craft, and (e) other blue-collar, with farming the omitted category); MAR is a dummy variable indicating whether the person is married or not married; AS is a dummy variable indicating whether the person is Asian or not (used only for regressions on the first racial category); and ε is a stochastic error term. Future earnings are projected on the basis of the regression coefficients.

The remaining steps are as follows. First, coverage is assigned based on whether the individual expects to receive Social Security benefits and on whether the individual was salaried or self-employed. Second, on the basis of the person's earnings history, the person's Average Indexed Monthly Earnings (AIME) is computed. Third, on the basis of existing rules, the person's Primary Insurance Amount (PIA) is derived from AIME. Fourth, Social Security wealth for current workers is given by

$$(4) \quad \text{SSW}_w = \int_{LR} \text{PIA}(1 - m_t)e^{-\delta^*t} dt.$$

As with pension wealth, the integration runs from the expected age of retirement to age 109.²

Estimates are then provided for the following components of household wealth:

$$(5) \quad \text{HDW} = \text{HDWX} + \text{PCSV}$$

where PCSV is the cash surrender value of Defined Contribution pension plans and HDWX is marketable household wealth excluding PCSV. HDW corresponds to marketable wealth or net worth. Retirement wealth RW is the sum of total pension wealth and social security wealth:

$$(6) \quad \text{RW} = \text{PCSV} + \text{PW} + \text{SSW}$$

Augmented household wealth, AW, is then given by

$$(6) \quad \text{AW} = \text{HDWX} + \text{RW}.$$

RESULTS

Trends in Income and Wealth

Median household income among the entire U.S. population, after falling by 5% between 1983 and 1989, grew by 6% from 1989 to 1998, for a net change of only one percent (Table 3.1). Mean income rose by 4% from 1983 to 1989, declined by 5% from 1989 to 1995, and then climbed by 11% in 1998, for a net change of 11%. Among households in ages 47 and over, both mean and median income grew by a respectable 16% in real terms (about 1% per year) over the years from 1983 to 1998. The rate of growth was much higher in the 1989–98 period than in the 1983–89 period. For households in the 47–64 age bracket, mean income increased by 20%, while median income grew by 14%. Here, too, gains were greater after 1989 than before. Among elderly households (age 65 and over), mean income rose by only 11%, about half the rate for the 47–64 age bracket, while median income climbed 18%, much greater than the younger age group. Once again, gains were greater after 1989 than before.

Results for five-year age groups are shown in the last three panels of Table 3.1. Results have to be interpreted with some caution because sample sizes are relatively small (and hence standard errors are relatively high) for some age groups, particularly the older ones. All five-year age groups showed improvement in mean income over the period from 1983 to 1998. Increases were particularly strong for households headed by persons 71 and over and, generally speaking, those in their fifties. Most five-year age groups showed gains in the 1989–98 period but changes were more mixed in the 1983–89 period. Median income also advanced for almost all five-year age groups between 1983 and 1998. Gains were again strongest among the older age groups—in this case, age 71 and over. Median income rose among most age groups during the 1983–89 and 1989–98 periods.

Table 3.2 shows a similar set of statistics for net worth. Among all U.S. households, median wealth, after growing by 7% between 1983 and 1989, was only 4% greater in 1998 than in 1989. Mean wealth also showed a sharp increase of 15% from 1983 to 1989 followed by another relatively strong performance of 11% from 1989 to 1998. Overall, it was 27% higher in 1998 than in 1983 and 11% larger than in 1989. The fact that mean wealth increased so much more than median wealth is indicative of rising wealth inequality over this period.

Between 1983 and 1998, mean wealth in real terms increased by a robust 22% (or 1.3% per year) among all households ages 47 and over and median wealth grew even more, 26% (or 1.5% per year). Most of the growth of mean wealth occurred after 1989 whereas most of the gains in median wealth occurred before 1989. Among households in the 47–64 age bracket,

TABLE 3.1. Household Income by Age Class, 1983, 1989, and 1998
(In thousands, 1998 dollars)

	Percentage Change						Ratio to Overall Mean or Median	
	1983	1989	1998	1983-89	1989-98	1983-98	1983	1998
<i>All Households</i>								
1. Mean Income	46.9	49.0	52.3	4.4%	6.7%	11.4%	1.00	1.00
2. Median Income	33.1	31.6	33.4	-4.6%	5.6%	0.8%	1.00	1.00
<i>Ages 47 and over</i>								
1. Mean Income	48.2	49.7	56.0	3.2%	12.6%	16.2%	1.03	1.07
2. Median Income	27.9	28.4	32.4	1.9%	14.1%	16.3%	0.84	0.97
<i>Ages 47-64</i>								
1. Mean Income	58.2	62.7	70.1	7.6%	11.9%	20.4%	1.24	1.34
2. Median Income	38.6	39.4	44.0	2.3%	11.6%	14.1%	1.16	1.32
<i>Ages 65 and over</i>								
1. Mean Income	33.9	34.4	37.6	1.7%	9.3%	11.2%	0.72	0.72
2. Median Income	17.8	18.9	21.0	6.6%	10.9%	18.3%	0.54	0.63

INCOME BY FIVE-YEAR AGE GROUPS, AND SAMPLE SIZES

<i>A. Mean Income by Five-Year Age Group</i>								
Ages 47 and over	48.2	49.7	56.0	3.2%	12.6%	16.2%	1.03	1.07
Age: 47-52	58.7	76.9	67.5	31.1%	-12.3%	15.0%	1.25	1.29
Age: 53-58	62.4	60.3	74.0	-3.3%	22.7%	18.6%	1.33	1.42
Age: 59-64	53.1	51.7	69.5	-2.6%	34.5%	31.0%	1.13	1.33
Age: 65-70	45.9	37.9	50.0	-17.4%	31.9%	8.9%	0.98	0.96
Age: 71-76	28.7	40.9	35.3	42.6%	-13.8%	22.9%	0.61	0.67
Age: 77 & Over	22.8	25.3	28.3	11.1%	11.6%	24.0%	0.49	0.54
<i>B. Median Income by Five-Year Age Group</i>								
Ages 47 and over	27.9	28.4	32.4	1.9%	14.1%	16.3%	0.84	0.97
Age: 47-52	41.8	46.0	49.0	9.9%	6.5%	17.1%	1.26	1.47
Age: 53-58	42.6	39.4	43.0	-7.3%	9.0%	1.1%	1.28	1.29
Age: 59-64	32.5	32.9	35.0	1.2%	6.5%	7.8%	0.98	1.05
Age: 65-70	23.2	20.2	26.0	-12.9%	28.4%	11.8%	0.70	0.78
Age: 71-76	17.0	21.0	21.0	23.9%	-0.2%	23.7%	0.51	0.63
Age: 77 & Over	11.5	17.1	16.0	49.0%	-6.4%	39.5%	0.35	0.48
<i>C. Sample Sizes</i>								
Ages 47 and over	1962	1781	2358					
Age: 47-52	393	350	608					
Age: 53-58	383	366	476					
Age: 59-64	397	335	370					
Age: 65-70	340	301	339					
Age: 71-76	229	201	272					
Age: 77 & Over	220	228	293					

Source: Author's computations from the 1983, 1989, and 1998 Survey of Consumer Finances. The 1983 weights are the Full Sample 1983 Composite Weights, and the 1989 weights are the average of the SRC Design-S1 series (X40131) and the SRC designed based weights (X40125). The 1998 weights are partially Designed-Based weights (X42001), which account for the systematic deviations from the CPS estimates of home ownership by racial/ethnic groups. The 1983 and 1989 asset and liability entries are aligned to national balance sheet totals (see Wolff, 2001, for details). Households are classified by the age of the head of household.

TABLE 3.2. Household Net Worth by Age Class, 1983, 1989, and 1998
(In thousands, 1998 dollars)

							Ratio to Overall Mean or Median	
				Percentage Change				
	1983	1989	1998	1983-89	1989-98	1983-98	1983	1998
<i>All Households</i>								
1. Mean Net Worth	212.6	243.6	270.3	14.6%	11.0%	27.1%	1.00	1.00
2. Median Net Worth	54.6	58.4	60.7	7.0%	3.8%	11.1%	1.00	1.00
<i>Ages 47 and over</i>								
1. Mean Net Worth	343.2	366.7	418.6	6.8%	14.2%	22.0%	1.61	1.55
2. Median Net Worth	96.8	111.9	121.5	15.6%	8.6%	25.5%	1.77	2.00
<i>Ages 47-64</i>								
1. Mean Net Worth	343.4	375.0	444.6	9.2%	18.6%	29.5%	1.62	1.65
2. Median Net Worth	99.7	122.6	110.4	23.0%	-9.9%	10.8%	1.83	1.82
<i>Ages 65 and over</i>								
1. Mean Net Worth	343.0	356.9	384.9	4.1%	7.8%	12.2%	1.61	1.42
2. Median Net Worth	93.8	100.7	133.7	7.3%	32.8%	42.5%	1.72	2.20

NET WORTH BY FIVE-YEAR AGE GROUPS*A. Mean Net Worth by Five-Year Age Groups*

Ages 47 and over	343.2	366.7	418.6	6.8%	14.2%	22.0%	1.61	1.55
Age: 47-52	319.6	369.1	361.5	15.5%	-2.0%	13.1%	1.50	1.34
Age: 53-58	354.7	352.4	447.1	-0.6%	26.9%	26.1%	1.67	1.65
Age: 59-64	358.7	404.1	584.3	12.6%	44.6%	62.9%	1.69	2.16
Age: 65-70	465.7	435.0	471.4	-6.6%	8.4%	1.2%	2.19	1.74
Age: 71-76	276.9	341.3	407.0	23.3%	19.2%	47.0%	1.30	1.51
Age: 77 & Over	230.1	282.0	282.4	22.5%	0.2%	22.7%	1.08	1.05

B. Median Net Worth by Five-Year Age Groups

Ages 47 and over	96.8	111.9	121.5	15.6%	8.6%	25.5%	1.77	2.00
Age: 47-52	82.6	123.1	94.3	49.0%	-23.4%	14.1%	1.51	1.55
Age: 53-58	114.8	116.9	103.0	1.8%	-11.9%	-10.3%	2.10	1.70
Age: 59-64	122.5	122.6	165.2	0.1%	34.7%	34.9%	2.24	2.72
Age: 65-70	120.3	85.9	140.3	-28.6%	63.3%	16.6%	2.20	2.31
Age: 71-76	83.8	147.8	139.6	76.4%	-5.5%	66.6%	1.53	2.30
Age: 77 & Over	70.2	79.3	117.6	13.0%	48.2%	67.5%	1.29	1.94

Source: Author's computations from the 1983, 1989, and 1998 Survey of Consumer Finances. See notes to Table 3.1 for technical details. Households are classified by the age of the head of household.

mean wealth increased by a sizeable 30% over the 1983-98 period, faster than that for all households aged 47 and over, while median wealth grew by a more modest 11%, slower than that for those households 47 and over. Here, again, gains in mean wealth were greater after 1989 than before while the opposite was true for median wealth (in fact, median net worth actually declined from 1989 to 1998). In contrast, mean wealth grew much slower among elderly households, only 12%, while median wealth climbed by a striking 43%. Almost all the growth in median net worth occurred after 1989.

Here, again, with only one exception, each five-year age group saw both its mean and median wealth expand over the period from 1983 to 1998.³ Gains were again strongest among the oldest age groups, particularly in terms of median wealth. These households tended to do somewhat better in terms of mean wealth growth during the 1989–98 period than during the earlier one, though the picture is mixed with respect to changes in median wealth.

It is also of interest to compare the results here with those of James Smith (2002). Smith used the Health and Retirement Study/AHEAD sample, which covers the assets and liabilities of households in the age range 51–61 in 1992. His estimate of the average household net worth of this group was \$162,100. I made a similar calculation from the 1992 Survey of Consumer Finances and estimated a net worth (including vehicles) of \$336,800 for the same age group—slightly more than twice as great.⁴ The difference is due to the greater representation of high wealth households and the greater coverage of assets in the SCF.

Retirement Wealth

I next look at mean pension holdings (see Tables 3.3 and 3.5). There were huge increases both in average holdings of DC pension accounts and the percentage of households holding these kinds of plans. Among households in age group 47 and over, the average value of these accounts increased almost ten-fold between 1983 and 1998, from \$5000 (in 1998 dollars) to \$53.1 thousand. Among age group 47–64, the increase was by a factor of 8.4, while among elderly households, the increase was by a factor of 17.1. Most of the growth occurred after 1989. Moreover, the share of households in age group 47 and over holding a DC pension account surged from 7.8% in 1983 to 47.8% in 1998, or by almost 40 percentage points. The proportion holding pension accounts advanced by 48 percentage points among households in age group 47–64 and by 30 percentage points among elderly households. In 1998, about 60% of households in the age range of 47 to 64 held some form of DC account, compared to 32% of elderly households. Here, too, most of the gains occurred after 1989.

Mean DC pension wealth rose very strongly with age in 1998, from \$53 thousand among age group 47–52 to \$105 thousand for age group 59–64, and then tailed off with age, down to \$8 thousand among those aged 77 and over. After age 64, the ownership rate of these accounts generally fell with age, reaching a low of 14% for households aged 77 and over. Large increases in both the ownership rate and mean holdings of DC pension accounts were recorded for all five-year age groups between 1983 and 1998—particularly after 1989.

Opposite trends are apparent for Defined Benefit (DB) pension wealth. Among households in age group 47 and over, the average value of DB pension wealth fell by 15% between 1983 and 1998, from \$74,000 (in 1998 dollars) to \$62,800. The share of these households with DB pension wealth also

TABLE 3.3. Household Pension Wealth by Five-Year Age Class, 1983, 1989, and 1998 (In thousands, 1998 dollars)

	Mean Value			Percentage Change			Percent Holding Asset			Percentage Point Change		
	1983	1989	1998	1983-89	1989-98	1983-98	1983	1989	1998	1983-89	1989-98	1983-98
<i>A. DC Pension Accounts</i>												
All, Age 47 and over	5.0	9.5	53.1	90%	458%	959%	7.8	15.9	47.8	8.1	31.9	39.9
Age: 47-52	7.9	17.5	51.8	121%	196%	554%	14.2	35.7	57.5	21.4	21.8	43.2
Age: 53-58	8.8	17.8	65.9	103%	269%	648%	14.1	35.3	61.2	21.3	25.8	47.1
Age: 59-64	6.0	12.8	104.8	113%	718%	1646%	8.3	13.9	57.9	5.6	44.0	49.6
Age: 65-70	1.9	3.2	54.5	63%	1619%	2700%	3.4	2.1	49.6	-1.3	47.5	46.2
Age: 71-76	2.5	2.1	38.2	-15%	1728%	1450%	2.0	1.9	35.4	-0.2	33.6	33.4
Age: 77 & Over	0.3	0.0	8.2	—	—	3013%	0.1	0.0	14.0	-0.1	14.0	13.8
<i>B. Gross (DB) Pension Wealth</i>												
All, Age 47 and over	74.0	72.9	62.8	-2%	-14%	-15%	67.8	58.9	45.9	-8.9	-13.0	-21.9
Age: 47-52	66.0	43.2	35.8	-35%	-17%	-46%	67.6	54.5	38.9	-13.0	-15.7	-28.7
Age: 53-58	96.8	57.0	50.4	-41%	-12%	-48%	69.0	63.4	42.4	-5.6	-21.0	-26.6
Age: 59-64	96.4	111.6	88.1	16%	-21%	-9%	70.1	64.5	49.2	-5.6	-15.4	-21.0
Age: 65-70	73.6	114.9	101.2	56%	-12%	38%	72.7	64.6	55.6	-8.1	-9.0	-17.1
Age: 71-76	51.3	73.7	76.8	44%	4%	50%	62.1	51.0	49.9	-11.1	-1.2	-12.3
Age: 77 & Over	38.0	32.0	52.6	-16%	65%	39%	62.6	51.7	46.1	-10.9	-5.6	-16.5
<i>E. DC Pension Accounts plus Gross (DB) Pension Wealth</i>												
All, Age 47 and over	79.1	82.4	115.9	4%	41%	47%	68.9	65.0	69.5	-3.8	4.4	0.6
Age: 47-52	74.0	60.7	87.6	-18%	44%	18%	68.5	72.3	71.1	3.9	-1.3	2.6
Age: 53-58	105.6	74.9	116.3	-29%	55%	10%	70.3	75.3	74.1	4.9	-1.2	3.8
Age: 59-64	102.4	124.4	192.9	21%	55%	88%	71.1	68.7	78.2	-2.4	9.4	7.1
Age: 65-70	75.5	118.0	155.6	56%	32%	106%	73.3	65.1	76.1	-8.3	11.0	2.8
Age: 71-76	53.8	75.8	115.0	41%	52%	114%	63.6	51.1	65.8	-12.5	14.7	2.2
Age: 77 & Over	38.2	32.0	60.8	-16%	90%	59%	62.7	51.7	51.7	-11.0	0.0	-11.0

Source: Author's computations from the 1983, 1989, and 1998 Survey of Consumer Finances. Households are classified by the age of the head of household

TABLE 3.4. Household Social Security and Total Retirement Wealth by Five-Year Age Class, 1983, 1989, and 1998 (In thousands, 1998 dollars)

	Mean Value			Percentage Change			Percent Holding Asset			Percentage Point Change		
	1983	1989	1998	1983–89	1989–98	1983–98	1983	1989	1998	1983–89	1989–98	1983–98
<i>A. Gross Social Security Wealth</i>												
All, Age 47 and over	138.5	113.8	123.1	-18%	8%	-11%	86.1	98.8	97.7	12.7	-1.1	11.6
Age: 47–52	108.7	91.5	104.8	-16%	15%	-4%	90.7	98.8	99.6	8.1	0.8	8.8
Age: 53–58	138.6	102.4	123.5	-26%	21%	-11%	94.5	99.4	98.3	5.0	-1.1	3.9
Age: 59–64	174.1	124.0	151.0	-29%	22%	-13%	90.7	97.5	99.0	6.8	1.5	8.3
Age: 65–70	171.4	138.7	166.1	-19%	20%	-3%	85.1	99.0	98.5	13.9	-0.6	13.3
Age: 71–76	131.8	142.4	130.3	8%	-8%	-1%	75.9	100.0	98.3	24.1	-1.7	22.3
Age: 77 & Over	89.5	88.8	84.3	-1%	-5%	-6%	67.8	98.5	92.1	30.8	-6.4	24.4
<i>B. DC Pension plus Gross (DB) Pension plus Gross Social Security Wealth</i>												
All, Age 47 and over	217.6	196.2	239.1	-10%	22%	10%	97.2	99.4	98.3	2.2	-1.1	1.1
Age: 47–52	182.6	152.2	192.4	-17%	26%	5%	96.0	98.8	100.0	2.8	1.2	4.0
Age: 53–58	244.2	177.2	239.8	-27%	35%	-2%	97.6	100.0	98.9	2.4	-1.1	1.3
Age: 59–64	276.6	248.3	343.9	-10%	38%	24%	97.5	99.3	99.0	1.9	-0.3	1.5
Age: 65–70	246.9	256.7	321.8	4%	25%	30%	99.8	99.0	98.5	-0.8	-0.6	-1.3
Age: 71–76	185.6	218.2	245.3	18%	12%	32%	97.4	100.0	98.8	2.6	-1.2	1.4
Age: 77 & Over	127.7	120.8	145.1	-5%	20%	14%	94.1	99.2	93.8	5.0	-5.4	-0.4
<i>MEMO:</i>												
<i>C. Median (DC) Pension plus Gross (DB) Pension plus Gross Social Security Wealth</i>												
All, Age 47 and over	184.2	143.3	171.6	-22%	20%	-7%						
Age: 47–52	139.6	123.8	150.0	-11%	21%	7%						
Age: 53–58	191.0	143.9	175.3	-25%	22%	-8%						
Age: 59–64	246.5	182.7	215.0	-26%	18%	-13%						
Age: 65–70	232.5	207.7	255.0	-11%	23%	10%						
Age: 71–76	154.8	168.3	183.0	9%	9%	18%						
Age: 77 & Over	96.5	100.8	105.0	4%	4%	9%						

Source: Author's computations from the 1983, 1989, and 1998 Survey of Consumer Finances. Households are classified by the age of the head of household

TABLE 3.5. Household Retirement Wealth by Age Class, 1983, 1989, and 1998 (In thousands, 1998 dollars)

	1998 Mean/ Median Value	Holding Percentage Change			Percent Percentage Asset, 1998	Point Change		
		1983- 89	1989- 98	1983- 98		1983- 89	1989- 98	1983- 98
<i>All, Age 47 and over</i>								
1. Mean DC Pensions	53.1	90%	458%	959%	47.8	8.1	31.9	39.9
2. Mean DB Pension Wealth	62.8	-2%	-14%	-15%	45.9	-8.9	-13.0	-21.9
3. Mean DC+DB Pension Wealth	115.9	4%	41%	47%	69.5	-3.8	4.4	0.6
4. Mean Social Security Wealth	123.1	-18%	8%	-11%	97.7	12.7	-1.1	11.6
5. Mean DC+DB Pension Wealth Plus Social Security Wealth	239.1	-10%	22%	10%	98.3	2.2	-1.1	1.1
6. Median DC+DB Pension Wealth Plus Social Security Wealth	171.6	-22%	20%	-7%				
<i>Ages 47-64</i>								
1. Mean DC Pensions	69.2	118%	330%	838%	59.7	16.4	31.4	47.8
2. Mean DB Pension Wealth	52.7	-18%	-26%	-39%	42.4	-8.0	-18.6	-26.5
3. Mean DC+DB Pension Wealth	121.9	-8%	40%	29%	73.7	1.9	1.6	3.5
4. Mean Social Security Wealth	121.7	-24%	15%	-13%	99.0	6.4	0.5	6.9
5. Mean DC+DB Pension Wealth Plus Social Security Wealth	243.5	-18%	26%	4%	99.4	2.3	0.0	2.3
6. Median DC+DB Pension Wealth Plus Social Security Wealth	175.2	-29%	25%	-11%				
<i>Ages 65 and over</i>								
1. Mean DC Pensions	32.3	7%	1706%	1826%	32.3	-0.8	31.0	30.2
2. Mean DB Pension Wealth	75.9	35%	1%	36%	50.4	-9.7	-6.1	-15.8
3. Mean DC+DB Pension Wealth	108.3	34%	40%	89%	64.0	-10.3	7.3	-3.0
4. Mean Social Security Wealth	125.0	-9%	2%	-8%	96.0	21.6	-3.1	18.5
5. Mean DC+DB Pension Wealth Plus Social Security Wealth	233.3	4%	17%	21%	96.8	2.0	-2.6	-0.5
6. Median DC+DB Pension Wealth Plus Social Security Wealth	169.8	-8%	12%	4%				

Source: Author's computations from the 1983, 1989, and 1998 Survey of Consumer Finances. See notes to Table 3.1 for technical details. Households are classified by the age of the head of household.

fell, by 22 percentage points, 68.0% to 45.9%. Most of the loss in coverage occurred during the 1989–98 period. Losses were particularly marked for age group 47–64, who saw their mean DB pension wealth decline by 39% between 1983 and 1998 and the share covered by DB plans fall by 27 percentage points. However, the average value of DB plans actually rose by 36% among elderly household over this period, though the share covered fell by 16 percentage points. As with DC pensions, the average amount of DB pension wealth generally rises with age until age group 65–70 and then declines with age. The same pattern is observable with the share of households covered by DB pension plans.

We can now consider whether the spread of DC-type pension plans adequately compensated for the decline in traditional DB pension coverage. Total pension wealth (the sum of DC and DB pensions) increased for all age groups between 1983 and 1998. Among households in age group 47–64, the mean value of total pension wealth increased by 29%, with all the growth occurring after 1989, while among elderly households the mean value jumped by 89%, with the gains about evenly split before and after 1989. Percentage increases in the mean value of total pensions were much lower for households between 47 and 58 years of age, averaging around 14%. However, households in the age group 59 to 76 saw their average total pension wealth almost double. Even households in age group 77 and over enjoyed a 59% increase in their average total pension holdings.

The percentage of households in age group 47 and over covered by either a DC or a DB plan increased slightly (from 68.9 to 69.5%) from 1983 to 1998. Among the 47–64 age group, the proportion rose by 3.5 percentage points, to 73.7% in 1998, while among the elderly, the share fell by 3.0 percentage points, down to 64 percent in 1998. The share of households covered by pensions grew by two percentage points or more for all age groups between age 47 and 76. Households in age group 77 and over were the only ones to see their coverage slip, by 11 percentage points, with all the decline occurring between 1983 and 1989.

In contrast, as shown in Tables 3.4 and 3.5, Social Security wealth generally declined among older Americans. The average value of Social Security wealth among all households age 47 and over fell by 11% between 1983 and 1998, from 138 to 123 thousand dollars. Households in the 47–64 age bracket saw their average social security wealth decline by 13%, while elderly households experienced a 8% decline. In all cases, social security wealth first fell during the years 1983 to 1989 and then increased from 1989 to 1998. Decreases in average social security wealth occurred for all age groups and were particularly marked for age groups 53–58 and 59–64. Almost all five-year age groups saw their average Social Security wealth fall from 1983 to 1989, and almost all experienced gains from 1989 to 1998. However, the losses sustained in the earlier period were greater than the increases in the latter period.

In contrast, Social Security coverage expanded over the 1983–1998 period. Among households in age group 47 and over, the share grew by

12 percentage points, with all the gain occurring before 1989. The share increased by 7 percentage points among age group 47–64 and by 19 percentage points among the elderly. Here, too, almost all the gains happened before 1989. The share of households covered by Social Security increased among all five-year age groups, particularly over the 1983–89 period. Gains were especially high among older age groups (65 and over).

Total retirement wealth (RW) is the sum of DC pensions, DB pension wealth, and Social Security wealth. Among households in age group 47 and over, mean retirement wealth grew by 10%, over this period. In fact, from 1983 to 1989, it declined by 10% and then increased by 22% in the years 1989 to 1998. The proportion of households with some form of retirement wealth also rose slightly, from 97.2 to 98.3%. In contrast, median retirement wealth generally fell over the 1983 to 1998 period. Among households in the age group 47 and over, median retirement wealth decreased by 7%, from \$184,000 to \$172,000. There was a steep decline in median retirement wealth between 1983 and 1989 followed by a sizeable recovery between 1989 and 1998 but the net change was negative.

The pattern is similar for the 47–64 age group. Between 1983 and 1998, mean retirement wealth increased by 4%, median retirement wealth fell by 11%, and the share of households with retirement wealth increased by 2.3 percentage points to 99.4%. In contrast, mean retirement wealth among the elderly rose by 21% over the 1983–1998 period and median retirement wealth grew by 4%, while the share of elderly households with retirement wealth fell by 0.5 percentage points to 96.8%. There was very little change in the level of retirement wealth among households in age groups 47–52 and 53–58. However, mean retirement wealth increased by between 24 and 32% among households in the age range from 59 to 76 and by 14% among the oldest age group. The biggest drops in median retirement wealth occurred among age groups 53–58 and 59–65 (by about 10%). Median retirement wealth grew by between 9 and 18% among elderly age groups (age 65 and over).

Here, too, a comparison with the calculations of Smith (2002) based on the 1992 AHEAD sample might prove of interest. In Table 3.3, he reported a ratio of Social Security wealth to income for age group 51–61 of 2.12 and a ratio of pension wealth to income of 1.85. My corresponding figures for age group 47–64 are 1.69 and 1.39, respectively, on the basis of the 1989 SCF and 1.73 and 1.74, respectively, on the basis of the 1998 SCF.⁵ It is not clear what the source of the differences is (Smith does not report the actual mean income of his sample). However, my estimates of the ratio of total (augmented) wealth to income are 8.8 in both 1989 and 1998—directly comparable to Smith's estimate of 8.8 in 1992.

Demographic Breakdowns

There are marked differences in income and wealth between non-Hispanic whites on the one hand and African-Americans and Hispanics on the other

(see Table 3.6).⁶ In 1998, for example, the mean income of the latter group averaged about half that of non-Hispanic white households, while mean wealth holdings averaged about a quarter. There are also marked differences in retirement wealth between the two groups. In 1998, the mean (DC plus DB) pension wealth of the latter group averaged about half that of non-Hispanic white households, while mean Social Security wealth averaged about 60%. All told, mean (total) retirement wealth among blacks and Hispanics was a little more than half that of non-Hispanic white households.

Among households in the 47–64 age bracket, mean income rose more among whites than among blacks and Hispanics over the period from 1983 to 1998 (21% versus 13%), while mean wealth grew much more among the latter (29% versus 87%). However, mean pension wealth jumped by 33% among the former but declined by 18% among the latter. Social Security wealth declined for both groups but much more for African-Americans and Hispanics than for non-Hispanic whites—20% versus 12%. As a result, average retirement wealth gained 6% among white households but **lost** 20% among blacks and Hispanics. All told, mean augmented wealth still advanced somewhat more among white households than among black and Hispanic households (10% versus 3%).

Among elderly households, both mean income and mean wealth grew three to four times as much among blacks and Hispanics as among whites. Mean pension wealth grew about the same degree (87% versus 89%). Social Security wealth again fell much more among blacks and Hispanics (31%) than among whites (5%). Consequently, average retirement wealth advanced by 23% among whites but fell back by 3% among blacks and Hispanics. As a result, mean augmented wealth showed a slightly greater gain among white households (9%) than among black and Hispanic households (7%).

A breakdown by age and marital status, as shown in Table 3.7, reveals much greater resources among married couples than among singles. The average income and wealth by age group among married couples is about double that of single males and about three times that of single females. Among married couples and single males, mean income, mean wealth, and augmented wealth improved over the 1983–1998 period for both age groups. Percentage gains were considerably greater for single males than married couples. Among single females, mean income fell slightly for age group 47–64 but rose somewhat for age group 65 and over, while mean wealth surged among the younger age group and increased modestly among the elderly.

In 1998, the average pension and retirement wealth among married couples was about double that of single males and about 2.5 to 3 times that of single females. Differences in Social Security wealth among these three groups were less marked, with the Social Security wealth of both single males and single females averaging about half that of married couples. Between 1983 and 1998, average pension wealth increased for both age groups among married couples and single males and among elderly single females but declined among single females in age group 47–64. However,

TABLE 3.6. Mean Wealth by Race/Ethnicity and Age Class, 1983, 1989, and 1998 (In thousands, 1998 dollars)

Category	Mean Value			Percentage Change			Ratio: African Amer. and Hispanics to Non- Hispanic Whites	
	1983	1989	1998	1983–89	1989–98	1983–98	1983	1998
A. Non-Hispanic White								
<i>Ages 47–64</i>								
Mean Income	63.8	71.9	77.5	12.7%	7.7%	21.4%		
Mean Net Worth (HDW)	398.6	447.1	514.6	12.2%	15.1%	29.1%		
Mean DC Plus DB Pension Wealth	101.3	100.9	134.8	–0.4%	33.6%	33.1%		
Mean Social Security Wealth	148.3	118.8	130.1	–19.9%	9.6%	–12.3%		
Mean Retirement Wealth	249.6	219.6	264.9	–12.0%	20.6%	6.1%		
Mean Augmented Wealth	639.8	647.4	702.1	1.2%	8.4%	9.7%		
<i>Ages 65 and over</i>								
Mean Income	36.8	38.7	40.2	5.1%	3.8%	9.1%		
Mean Net Worth (HDW)	385.1	423.7	426.4	10.0%	0.6%	10.7%		
Mean DC Plus DB Pension Wealth	61.8	78.0	115.7	26.1%	48.4%	87.1%		
Mean Social Security Wealth	140.2	132.5	132.8	–5.5%	0.2%	–5.3%		
Mean Retirement Wealth	202.1	210.5	248.5	4.2%	18.1%	23.0%		
Mean Augmented Wealth	585.4	632.1	638.4	8.0%	1.0%	9.1%		
B. African-American or Hispanic								
<i>Ages 47–64</i>								
Mean Income	31.6	28.1	35.9	–11.0%	27.4%	13.4%	0.50	0.46
Mean Net (HDW)	68.5	92.6	128.4	35.1%	38.8%	87.4%	0.17	0.25
Mean DC Plus DB Pension Wealth	66.7	43.7	54.8	–34.5%	25.3%	–17.9%	0.66	0.41
Mean Social Security Wealth	103.5	61.1	81.6	–41.0%	33.6%	–21.2%	0.70	0.63

TABLE 3.6. *continued*

Category	Mean Value			Percentage Change			Ratio: African Amer. and Hispanics to Non- Hispanic Whites	
	1983	1989	1998	1983–89	1989–98	1983–98	1983	1998
B. African-American or Hispanic								
Mean Retirement Wealth	170.2	104.8	136.4	-38.4%	30.1%	-19.9%	0.68	0.51
Mean Augmented Wealth	235.7	192.8	242.0	-18.2%	25.5%	2.6%	0.37	0.34
<i>Ages 65 and over</i>								
Mean Income	14.8	14.1	20.9	-5.1%	48.0%	40.5%	0.40	0.52
Mean Net Worth (HDW)	73.5	46.3	94.0	-37.1%	103.1%	27.8%	0.19	0.22
Mean DC Plus DB Pension Wealth	31.8	47.2	60.2	48.4%	27.6%	89.3%	0.51	0.52
Mean Social Security Wealth	102.4	75.4	70.4	-26.3%	-6.7%	-31.2%	0.73	0.53
Mean Retirement Wealth	134.2	122.6	130.6	-8.6%	6.5%	-2.7%	0.66	0.53
Mean Augmented Wealth	206.3	168.9	221.3	-18.2%	31.0%	7.2%	0.35	0.35

Source: Author's computations from the 1983, 1989, and 1998 Survey of Consumer Finances. See notes to Table 3.1 for technical details. Households are classified by the age of the head of household. Asians and other races are excluded from the table because of small sample sizes. Key: Retirement Wealth (RW) = DC Pension Accounts + DB Pension Wealth + Social Security Wealth. Augmented Wealth = Net Worth less PCSV (HDWX) + Retirement Wealth (RW)

Social Security wealth fell among married couples in both age groups and among both single males in age group 47–64. It increased among elderly single males and among both pre-retirement and elderly single females. Average retirement wealth advanced among married couples in both age groups among elderly females, and (very strongly) among single males in both age groups. It fell slightly among single females in age group 47–64. All told, the mean augmented wealth of married couples was about double that of single males and three times that of single females. Average augmented wealth advanced among by about 10% among both age groups of married couples, by 41% among single males in age group 47–64 and by 88% among elderly single males, and by about 7 to 8% among single females in both age groups.

Table 3.8 shows a similar set of statistics by homeowner status. In 1998, homeowners earned two and a half times to three times the income of renters

TABLE 3.7 Mean Wealth by Family Status and Age Class, 1983, 1989, and 1998 (In thousands, 1998 dollars)

Category	Mean Value			Percentage Change			Ratio: Singles to Married Couples	
	1983	1989	1998	1983-89	1989-98	1983-98	1983	1998
<i>A. Married Couples, Ages 47-64</i>								
Mean Income	72.8	81.4	91.3	11.8%	12.1%	25.4%		
Mean Net Worth (HDW)	453.7	502.5	594.2	10.8%	18.3%	31.0%		
Mean DC Plus DB Pension Wealth	109.6	109.9	154.1	0.2%	40.2%	40.5%		
Mean Social Security Wealth	182.5	133.7	156.6	-26.7%	17.2%	-14.2%		
Mean Retirement Wealth	292.1	243.6	310.7	-16.6%	27.6%	6.4%		
Mean Augmented Wealth	736.0	724.7	814.0	-1.5%	12.3%	10.6%		
<i>B. Married Couples, Ages 65 and over</i>								
Mean Income	49.1	52.5	56.0	7.0%	6.5%	13.9%		
Mean Net Worth (HDW)	511.8	590.4	564.4	15.4%	-4.4%	10.3%		
Mean DC Plus DB Pension Wealth	60.1	117.5	162.4	95.6%	38.2%	170.3%		
Mean Social Security Wealth	214.1	163.9	175.4	-23.4%	7.0%	-18.1%		
Mean Retirement Wealth	274.2	281.4	337.7	2.6%	20.0%	23.2%		
Mean Augmented Wealth	782.7	868.3	846.9	10.9%	-2.5%	8.2%		
<i>C. Single Males, Ages 47-64</i>								
Mean Income	32.7	43.2	49.0	32.0%	13.4%	49.8%	0.45	0.54
Mean Net Worth (HDW)	168.6	209.3	282.5	24.1%	34.9%	67.5%	0.37	0.48
Mean DC Plus DB Pension Wealth	44.0	51.3	94.2	16.7%	83.6%	114.3%	0.40	0.61
Mean Social Security Wealth	67.0	54.8	66.3	-18.3%	21.0%	-1.1%	0.37	0.42
Mean Retirement Wealth	111.0	106.1	160.5	-4.4%	51.3%	44.6%	0.38	0.52
Mean Augmented Wealth	277.4	307.7	391.9	10.9%	27.4%	41.3%	0.38	0.48

TABLE 3.7 *continued*

Category	Mean Value			Percentage Change			Ratio: Singles to Married Couples	
	1983	1989	1998	1983–89	1989–98	1983–98	1983	1998
<i>D. Single Males, Ages 65 and over</i>								
Mean Income	25.5	21.5	30.3	–15.8%	40.8%	18.6%	0.52	0.54
Mean Net Worth (HDW)	194.4	163.4	424.5	–16.0%	159.8%	118.4%	0.38	0.75
Mean DC Plus DB Pension Wealth	36.3	53.7	74.9	48.2%	39.3%	106.5%	0.60	0.46
Mean Social Security Wealth	68.9	69.5	91.6	0.8%	31.9%	32.9%	0.32	0.52
Mean Retirement Wealth	105.2	123.2	166.5	17.1%	35.1%	58.3%	0.38	0.49
Mean Augmented Wealth	299.6	286.6	563.5	–4.3%	96.6%	88.1%	0.38	0.67
<i>E. Single Females, Ages 47–64</i>								
Mean Income	28.9	24.6	28.7	–15.0%	16.5%	–0.9%	0.40	0.31
Mean Net Worth (HDW)	119.0	131.8	158.2	10.8%	20.1%	33.0%	0.26	0.27
Mean DC Plus DB Pension Wealth	67.5	46.0	56.3	–31.8%	22.3%	–16.6%	0.62	0.37
Mean Social Security Wealth	56.4	60.7	64.0	7.7%	5.3%	13.4%	0.31	0.41
Mean Retirement Wealth	123.9	106.8	120.3	–13.8%	12.6%	–2.9%	0.42	0.39
Mean Augmented Wealth	240.3	232.0	254.0	–3.4%	9.5%	5.7%	0.33	0.31
<i>F. Single Females, Ages 65 and over</i>								
Mean Income	17.7	18.6	19.1	5.0%	2.6%	7.7%	0.36	0.34
Mean Net Worth (HDW)	167.3	159.0	175.7	–5.0%	10.5%	5.0%	0.33	0.31
Mean DC Plus DB Pension Wealth	55.3	40.0	56.4	–27.7%	41.0%	1.9%	0.92	0.35
Mean Social Security Wealth	53.7	92.2	77.3	71.5%	–16.1%	43.9%	0.25	0.44
Mean Retirement Wealth	109.0	132.1	133.7	21.2%	1.2%	22.6%	0.40	0.40
Mean Augmented Wealth	276.3	291.1	301.3	5.3%	3.5%	9.0%	0.35	0.36

Source: Author's computations from the 1983, 1989, and 1998 Survey of Consumer Finances.
 Key: Retirement Wealth (RW) = DC Pension Accounts + DB Pension Wealth + Social Security Wealth. Augmented Wealth = Net Worth less PCSV (HDWX) + Retirement Wealth (RW)

and had about 6 to 8 times their wealth. Home owners also had about three times as much total pension wealth, about 50% more in Social Security wealth, about twice as much retirement wealth as renters, and about three to four times as much augmented wealth. Homeowners saw their income and net worth expand over the period from 1983 to 1998, particularly during the 1990s. Renters in age group 47–64 enjoyed increases in both income and wealth, but income and particularly net worth declined among elderly renters. Homeowners in both age groups saw gains in their holdings of pension wealth and in their total retirement wealth but declines in their Social Security wealth over the years 1983 to 1998. Renters in age bracket 47 to 64, on the other hand, experienced declines in pension wealth, social security wealth, and total retirement wealth, while elderly renters saw a modest gain in pension wealth but decreases in Social Security wealth and total retirement wealth. Augmented wealth increased among home owners in both age groups but declined among both pre-retirement and elderly renters.

CONCLUSIONS

In general, older Americans (those in households headed by a person age 47 and older) have seen marked improvements in both the mean levels and median levels of their income and wealth over the period 1983 to 1998—considerably greater than the American population at large (see Table 3.9). Advancement has been particularly pronounced for age groups 70 and over.

Traditional defined benefit pension coverage declined over the period from 1983 to 1998 (see the chapter on Gender Differences in Pension Wealth and Their Impact on Late-Life Inequality in this volume). The share of households in age group 47 and over covered by a DB plan fell by 22 percentage points, from 68% in 1983 to 46% in 1998. Coverage fell for all age groups as well. Mean DB pension wealth for age group 47 and over also decreased, from \$74,000 to \$63,000. Mean DB pension wealth declined for all age groups under age 65, though it did increase among all age groups 65 and over. Average DC pension wealth, on the other hand, skyrocketed for all these age groups. By 1998, about 60% of households in age groups 47 to 64 held some form of DC type pension plan, as did about 40% of households in age groups 65 and older.

The rise of DC pension plans more than fully compensated for the loss of DB type pension plans over the 1983–1998 period in terms of average values. Mean total pension wealth (the sum of DB plus DC wealth) increased by 47% in real terms between 1983 and 1998 among households in age group 47 and over. Mean total pension wealth also increased in every age group. The share of households aged 47 and over covered by either a DB or a DC pension plan also grew slightly over the period, from 68.9 to 69.5%. Coverage rates also increased for every age group except those in age group 77 and over. Social Security coverage also grew over the period, from 86% of

TABLE 3.8 Mean Wealth by Home Owner Status and Age Class, 1983, 1989, and 1998 (In thousands, 1998 dollars)

Category	Mean Value			Percentage Change			Ratio: Renters to Home Owners	
	1983	1989	1998	1983–89	1989–98	1983–98	1983	1998
A. Home Owners								
<i>Ages 47–64</i>								
Mean Income	67.1	71.8	81.9	7.0%	14.1%	22.0%		
Mean Net Worth (HDW)	431.3	456.5	555.2	5.8%	21.6%	28.7%		
Mean DC Plus DB Pension Wealth	106.8	103.4	143.4	–3.2%	38.7%	34.2%		
Mean Social Security Wealth	153.5	116.8	133.0	–23.9%	13.8%	–13.4%		
Mean Retirement Wealth	260.4	220.2	276.4	–15.4%	25.5%	6.1%		
Mean Augmented Wealth	682.6	657.6	746.8	–3.7%	13.6%	9.4%		
<i>Ages 65 and over</i>								
Mean Income	39.2	39.4	42.8	0.5%	8.8%	9.3%		
Mean Net Worth (HDW)	428.5	439.5	464.0	2.6%	5.6%	8.3%		
Mean DC Plus DB Pension Wealth	62.9	86.2	124.9	37.0%	45.0%	98.6%		
Mean Social Security Wealth	145.8	134.8	134.3	–7.5%	–0.4%	–7.9%		
Mean Retirement Wealth	208.7	221.0	259.2	5.9%	17.3%	24.2%		
Mean Augmented Wealth	634.9	658.6	685.8	3.7%	4.1%	8.0%		
B. Renters								
<i>Ages 47–64</i>								
Mean Income	28.5	30.8	30.2	8.2%	–2.2%	5.8%	0.43	0.37
Mean Net Worth (HDW)	47.4	90.2	67.7	90.5%	–25.0%	42.9%	0.11	0.12
Mean DC Plus DB Pension Wealth	52.4	29.6	48.4	–43.5%	63.5%	–7.6%	0.49	0.34
Mean Social Security Wealth	96.8	68.9	83.1	–28.9%	20.7%	–14.2%	0.63	0.63
Mean Retirement Wealth	149.3	98.5	131.6	–34.0%	33.6%	–11.9%	0.57	0.48

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TABLE 3.8 *continued*

Category	Mean Value			Percentage Change			Ratio: Renters to Home Owners	
	1983	1989	1998	1983-89	1989-98	1983-98	1983	1998
B. Renters								
Mean Augmented Wealth	195.1	183.0	183.3	-6.2%	0.2%	-6.0%	0.29	0.25
<i>Ages 65 and over</i>								
Mean Income	18.4	20.2	17.8	10.1%	-11.8%	-3.0%	0.47	0.42
Mean Net Worth (HDW)	93.8	118.6	82.2	26.4%	-30.6%	-12.3%	0.22	0.18
Mean DC Plus DB Pension Wealth	41.3	50.7	44.5	22.9%	-12.2%	7.9%	0.66	0.36
Mean Social Security Wealth	105.7	87.8	89.4	-16.9%	1.8%	-15.4%	0.73	0.67
Mean Retirement Wealth	147.0	138.6	134.0	-5.7%	-3.3%	-8.9%	0.70	0.52
Mean Augmented Wealth	240.8	255.5	203.3	6.1%	-20.4%	-15.6%	0.38	0.30

Source: Author's computations from the 1983, 1989, and 1998 Survey of Consumer Finances. Households are classified by the age of the head of household. Key: Retirement Wealth (RW) = DC Pension Accounts + DB Pension Wealth + Social Security Wealth. Augmented Wealth = Net Worth less PCSV (HDWX) + Retirement Wealth (RW)

households in age group 47 and over in 1983 to 98% in 1998. Mean Social Security wealth fell over the period by 11%, from \$138,400 in 1983 to \$123,200 in 1998. Still, mean retirement wealth increased by 10% over the 1983-1998 period among households aged 47 and over. Mean retirement wealth also grew among every age group as well, except for age group 53-58, which showed a slight decline. All told, mean augmented wealth grew by 9% among households in age group 47 and over, from \$555,800 in 1983 to \$604,600 in 1998, and among all age groups as well.

However, the story looks somewhat different when we look at trends in median values. Among households in age group 47 and over, median retirement wealth showed a 7% decline, from \$184,200 in 1983 to \$171,600 in 1998. Median retirement wealth fell by 11% among age group 47-64, though it did increase by 4% among the elderly. Moreover, among households in age group 47 and over, median net worth excluding DC pension plans grew by only 2% between 1983 and 1998. Indeed, among age group 47-64, it fell by 17% but rose by 34% among the elderly. Altogether, median augmented wealth fell by 9% among households aged 47 and over. Here, too, results

TABLE 3.9 Summary Table: Household Income and Wealth, 1983, 1989, and 1998 (In thousands, 1998 dollars)

	Percentage Change					
	1983	1989	1998	1983–89	1989–98	1983–98
<i>A. All, Age 47 and over</i>						
1. Mean Income	48.2	49.7	56.0	3.2%	12.6%	16.2%
2. Mean Net Worth less DC Pensions (HDWX)	338.2	357.2	365.5	5.6%	2.3%	8.1%
3. Mean DC+DB Pension Wealth	79.1	82.4	115.9	4.3%	40.7%	46.6%
4. Mean Social Security Wealth	138.5	113.8	123.1	-17.9%	8.2%	-11.1%
5. Mean Augmented Wealth	555.8	553.4	604.6	-0.4%	9.2%	8.8%
<i>Memo:</i>						
6. Median Income	27.9	28.4	32.4	1.9%	14.1%	16.3%
7. Median Net Worth less DC Pensions (HDWX)	95.9	108.1	98.0	12.7%	-9.3%	2.2%
8. Median Retirement Wealth	184.2	143.3	171.6	-22.2%	19.7%	-6.9%
9. Median Augmented Wealth	327.1	285.4	298.1	-12.7%	4.4%	-8.9%
<i>B. Ages 47–64</i>						
1. Mean Income	58.2	62.7	70.1	7.6%	11.9%	20.4%
2. Mean Net Worth less DC Pensions (HDWX)	336.0	358.9	375.5	6.8%	4.6%	11.7%
3. Mean DC+DB Pension Wealth	94.4	87.0	121.9	-7.8%	40.1%	29.1%
4. Mean Social Security Wealth	140.6	106.2	121.7	-24.5%	14.6%	-13.4%
5. Mean Augmented Wealth	571.0	552.1	619.0	-3.3%	12.1%	8.4%
<i>Memo:</i>						
6. Median Income	38.6	39.4	44.0	2.3%	11.6%	14.1%
7. Median Net Worth less DC Pensions (HDWX)	98.6	113.6	82.1	15.2%	-27.8%	-16.8%
8. Median Retirement Wealth	196.8	140.0	175.2	-28.8%	25.1%	-11.0%
9. Median Augmented Wealth	348.8	288.8	290.6	-17.2%	0.6%	-16.7%
<i>C. Ages 65 and over</i>						
1. Mean Income	33.9	34.4	37.6	1.7%	9.3%	11.2%
2. Mean Net Worth less DC Pensions (HDWX)	341.3	355.2	352.6	4.1%	-0.7%	3.3%

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TABLE 3.9 *continued*

	Percentage Change					
	1983	1989	1998	1983–89	1989–98	1983–98
3. Mean DC+DB Pension Wealth	57.4	77.1	108.3	34.3%	40.5%	88.7%
4. Mean Social Security Wealth	135.6	122.7	125.0	-9.5%	1.9%	-7.8%
5. Mean Augmented Wealth	534.2	554.9	585.8	3.9%	5.6%	9.7%
<i>Memo:</i>						
6. Median Income	17.8	18.9	21.0	6.6%	10.9%	18.3%
7. Median Net Worth less DC Pensions (HDWX)	93.4	100.7	125.1	7.9%	24.2%	34.0%
8. Median Retirement Wealth	163.3	151.0	169.8	-7.5%	12.5%	4.0%
9. Median Augmented Wealth	289.3	284.7	308.9	-1.6%	8.5%	6.8%

Source: Author's computations from the 1983, 1989, and 1998 Survey of Consumer Finances. Households are classified by the age of the head of household. Key: Retirement Wealth (RW) = DC Pensions (PCSV) + DB Pension Wealth (PW) + Social Security Wealth (SSW). Augmented Wealth = Net Worth less PCSV (HDWX) + Retirement Wealth (RW)

differ greatly between the non-elderly and the elderly. Among those in age group 47–64, median augmented wealth plummeted by 17% between 1983 and 1989, with all the decline occurring before 1989. Among the elderly, median augmented wealth increased by a modest 7% between 1983 and 1998.

Results vary by demographic group. In 1998, non-Hispanic white households had about four times the net worth, twice the income, and twice the pension, Social Security, and retirement wealth of African-American and Hispanic households. However, black and Hispanic households generally saw greater percentage gains in their mean income and wealth than did non-Hispanic whites, though white households enjoyed greater growth in their pension wealth and suffered smaller declines in their Social Security wealth. Indeed, average retirement wealth among white households in ages 47 and over gained 12% over the 1983–1998 period, compared to a 15% drop among blacks and Hispanics, and mean augmented wealth grew 9% among the former group and only 4% among the latter group.

In 1998, the average income and wealth of married couples were about double that of single males and four times that of single females, and married couples had about two to three times the pension, retirement, and augmented wealth of single males and females. However, single males in age group 47 and over generally experienced the greatest increases in average income, net worth, and retirement wealth of the three groups. Married couples in this age group also saw significant gains in income, wealth, pension

wealth, and overall retirement wealth. Single females had the smallest gains in mean income, wealth, and overall retirement wealth and generally experienced declines in their pension wealth.

In 1998, homeowners had three to four times the income, over ten times the net worth, about three times the pension wealth, twice the retirement wealth, and four times the augmented wealth of renters. Homeowners also had greater gains than renters over the 1983–1998 period in terms of income, net worth, pension wealth, and total retirement wealth.

All in all, some of the more disadvantaged groups did make gains in both in absolute and relative terms over the 1980s and 1990s. Still, by 1998, African-American and Hispanic households, as well as single females and renters, remained very low in terms of income and wealth and in terms of pension holdings.

In sum, the switchover from traditional DB pension plans to the newer DC-type plans has not been very beneficial to a broad swath of American workers. Indeed, the average (median) household in age group 47–64 saw its pension wealth creep up by a meager 2.2 percent over the 1983–1998 period, compared to an increase of 29 percent in mean pension wealth. Social Security wealth (both mean and median) also fell for this age group over the same period, due mainly to a decline in real earnings. As a result, most middle-aged Americans were worse off in terms of prospective retirement income security in 1998 as compared to 1983.

ENDNOTES

1. Technically speaking, the mortality rate m_t associated with the year of retirement is the probability of surviving from the current age to the age of retirement.
2. As with pension wealth, the mortality rate m_t associated with the year of retirement is the probability of surviving from the current age to the age of retirement.
3. Again, it is important to note that some of the sample sizes for the five-year age groups are relatively small, so that the results for five-year age groups have to be interpreted with some caution.
4. This figure is based on the unadjusted data in the 1992 SCF.
5. I do not have estimates of pension or Social Security wealth for 1992.
6. African-Americans are combined with Hispanics in order to maintain adequate sample sizes by age group.

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CHAPTER 4

The Economic Well-Being of Older People in International Perspective: A Critical Review

RICHARD DISNEY

UNIVERSITY OF NOTTINGHAM AND AXIA ECONOMICS

EDWARD WHITEHOUSE*

UNIVERSITY OF NEW SOUTH WALES AND AXIA ECONOMICS

Industrialized countries have adopted a variety of retirement-income systems. How well do these different systems fare in ensuring that older people have the resources to maintain a decent standard of living? And how should we measure countries' success at achieving this goal?

The cross-national analysis of income distributions is a relatively recent research topic, and most studies in this area have focused on the distribution of income across the population as a whole. Nevertheless, it is possible to extract the results relevant to the economic position of older people, and we draw on a dozen such studies, typically covering the early and mid-1990s, to attempt a 'meta-analysis' of these questions.

This chapter looks in turn at three standard measures of economic well-being. We first compare the average incomes of households comprising older people with those of the population as a whole (average replacement rates). Since averages can disguise a range of differences, we also disaggregate replacement rates for pensioners by sex, age and marital status. We then concentrate on the bottom end of the income distribution. We ask: relative to standard poverty benchmarks, how many of the old are poor? The next section looks at inequality of pensioners' incomes. We then consider how the relative incomes of older people have changed over time. After comparing income-distribution outcomes and the features of retirement-income systems, we look at broader concepts of command

over resources beyond the standard measure of cash and near-cash incomes. Finally, we discuss the implications of these findings.

The results show that the incomes of older people are typically around 80% of incomes of the whole population. This ratio has been increasing over the past two decades in most countries. Although there remain pockets of poverty among the elderly, they are generally represented proportionally or under-represented among the poor.

An important caveat is necessary. The procedure of examining the current income of pensioners and comparing them with the incomes of current workers must be used with care. In a contribution-based system, today's pensions depend on past contributions, past earnings and indeed the past savings behavior of today's pensioners. They also depend on the past rules of the pension system, which have changed significantly in most countries in the last decades. These changes will affect the future pattern of pensioners' incomes, and so current pensions may not be a good guide to the future. Note that the most recent data underlying the different studies are from the mid-1990s. Thus, recent policy reforms are not reflected in the results.

THE RELATIVE INCOMES OF OLDER PEOPLE

The simplest measure of the relative economic well-being of older people is to compare their average incomes with those of the population as a whole. Figure 4.1 shows the results of the latest income-distribution analysis compiled by the OECD on the basis of contributions from national experts.

In this study, older people are defined as individuals over 65. Incomes are measured on a household basis. They are adjusted for household size using an 'equivalence scale.' Individual equivalent income is here defined as the household income divided by the square root of the number of household members. (See Buhmann et al., 1988 and Atkinson, Rainwater, & Smeeding, 1995, for a discussion of equivalization in a cross-national context.) Since older people tend to live in smaller households, this adjustment boosts the measured economic well-being of older people relative to the population as a whole. Income comprises earnings, public transfers, investment incomes, private pensions *etc.* It excludes capital gains and incomes in kind (from public provision of health care, for example).

Averaging across the fifteen countries, older people's equivalent incomes are 83% of those of the population as a whole. Interpreting this average is quite difficult for a number of reasons. For example, people no longer face the costs of work (commuting, special clothing, etc.) when they are retired. A replacement rate of 100% would therefore probably reflect a sizeable increase in living standards relative to the working life. Younger

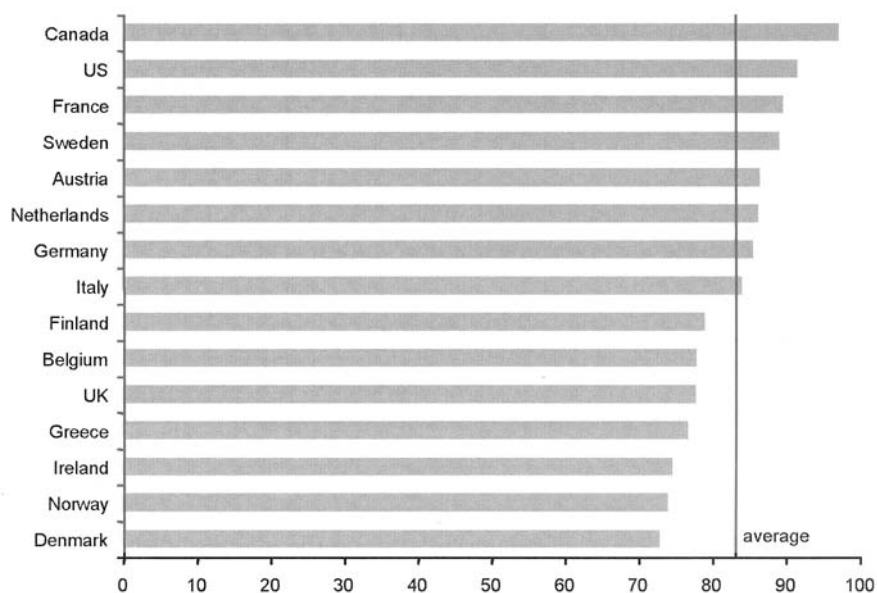


FIGURE 4.1 Pensioners' incomes as a percentage of population incomes in 15 countries

Source: Förster and Pellizzari (2000), Table 2.3

Note: Data are from 1994 and 1995 with the exception of Italy (1993); income is adjusted for household size by dividing by the square root of the number of household members

pensioners may also derive utility from increased leisure time, particularly if the requirements of their pre-retirement job prevented them from adjusting working hours to optimize the trade-off between work and leisure. Increased leisure time also provides opportunities for home production (home improvement, cookery, gardening, etc.) that might not have been possible before retirement. These additions to utility are not measured in conventional distributional studies.

Another important issue is the pattern of marginal utility of income with age. For example, the very elderly may be unable to enjoy expensive leisure pursuits. However, they may have large health and care costs, which are not taken into account. Morbidity rates are much higher for older people than for the working-age population and the costs of disability are recognized in benefit systems. In the United Kingdom, for example, recipients of disability benefits are much less likely to be in the lowest quintile of the population income distribution (13%) than pensioners as a whole (27%), because of their extra benefit entitlement (Department of Social Security, 2000b, Table 7.5). Nevertheless, it is not

possible to adjust incomes for the extra cost of disability and so there is a danger in overstating the purchasing power of the disabled.

Turning to the pattern across countries, the replacement rate in this study is highest in North America (97% in Canada and 92% in the United States) and lowest in two Nordic countries (Denmark and Norway: 73 and 74%). Other countries are bunched near to the average.

Comparing these results with other studies is hampered by a number of methodological and presentational differences: for example,

- The studies in Disney and Johnson (2001) disaggregate replacement rates by age, sex and marital status but do not present overall figures (nor are there population weights allowing one to derive the overall average); older people are defined as over 65 plus people aged 60–64 who are not in work;
- Hauser (1997) presents results divided by age; older people are defined by receipt of a pension benefit rather than age alone; the replacement rate is calculated relative to the incomes of households headed by someone under age 55;
- Disney, Mira d'Ercole, and Scherer (1998) compare households where the head is aged *circa* 67 with households headed by people aged *circa* 55; they show results separately for single people and couples and do not use an equivalence scale.

Nevertheless, the two OECD-based studies—Burniaux et al. (1998) and Förster and Pellizzari (2000)—can be compared directly. They report very similar results: the correlation coefficient of replacement rates across the nine countries common to both studies is 0.98 and the means are similar. However, both correlate very weakly with the earlier results of Whiteford and Kennedy (1995).

The Effect of Sex and Marital Status

Many studies differentiate results between different age groups and between single and married pensioners. These differences have obvious policy implications. For example, should the pension system pay more to older pensioners than to younger? What is the appropriate level of survivors' pensions relative to the pension paid to a couple?

Figure 4.2, based on Disney and Johnson (2001), splits the results by sex and compares single pensioners with married couples. Typically, single women's incomes are lower than those (equivalized) of married couples. The exceptions are Italy and the Netherlands, a finding confirmed by Disney, Mira d'Ercole, and Scherer (1998) and Hauser (1997). The latter also reports higher incomes for single women in Germany and Luxembourg. In contrast, single men typically fare better than married

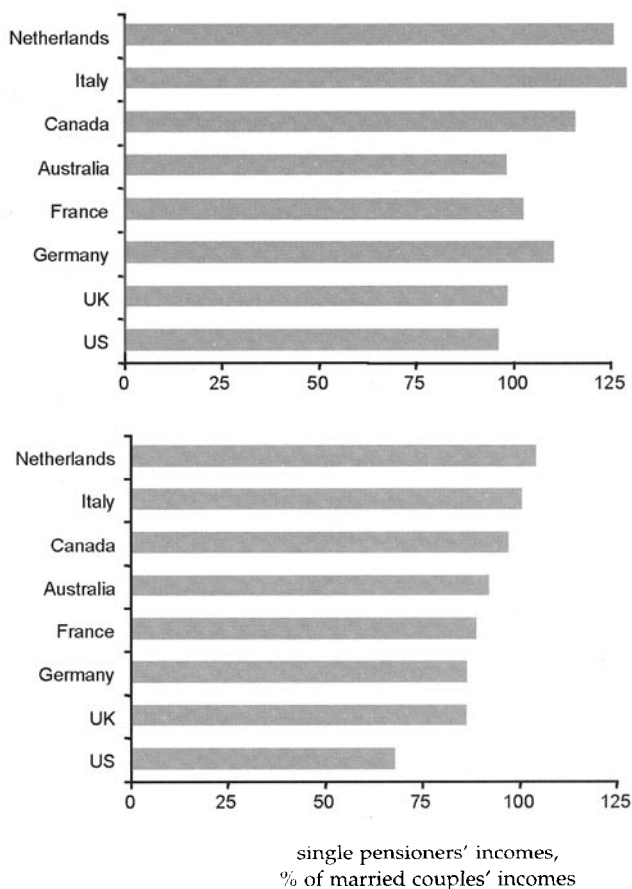


FIGURE 4.2 Single pensioners' incomes as a percentage of married couples' by sex in eight countries, equivalised. Single men (*top*) Single women (*bottom*)

Source: Disney and Johnson (2001), Table 1.13

Note: Data are mainly from between 1995 and 1997, with the exceptions of Germany (1993) and the Netherlands (1993–94)

couples. The exceptions are Australia, the United Kingdom and the United States, but single men's incomes in these countries are only marginally lower (2–4%) than are married couples'.

The results of replacement rates for married couples can be compared directly among three studies. The pair-wise correlation coefficients vary between 0.2 and 0.6 and none is statistically significant. Mean replacement rates also vary widely. Similarly, the results for two studies that allow us to separate out the replacement rate for single pensioners provide unrelated results.

The most convincing explanation for the patterns of incomes by sex and marital status is the difference in structure of social security (public-pension) benefits. For example, most continental European systems base the amount of public pension benefits wholly on contribution and earnings (see the descriptions of pension systems in section 5 below and in OECD, 2001 and Whitehouse, 2002a,b). A consequence is that the equalized incomes for married couples where one partner has an incomplete contribution history are lower than for single pensioners. But the flat-benefit systems of Denmark, Ireland, and the United Kingdom (and the means-tested system in Australia) pay a higher benefit to married couples where one partner (usually the wife in the case of these cohorts) has accumulated little or no pension rights of her own. This means that replacement rates for single pensioners are much closer to those of married couples than they are in other countries. Other features of retirement-income systems also have an effect on the pattern of incomes by sex and marital status.

Living Arrangements

Disney and Johnson (2001) posit another explanation for the relatively low incomes of single women. Many single female pensioners, especially those with few pension rights of their own, live with others. Since the means tests for social-assistance benefits can depend on household incomes, these single women can have little if any entitlement to public transfers. They therefore often have little income of their own.

However, Disney and Johnson's results, uniquely among the studies surveyed, are not based on household incomes. Instead, they are based on 'family' or 'income' units, which consist of a single person or couple and any dependent children. An elderly couple living with a grown-up child and his or her spouse count as two units under this approach, and their incomes are treated separately. Results of measures of income inequality and poverty are quite sensitive to the choice of unit: typically, the smaller the unit of measurement, the larger is measured poverty and inequality. Goodman, Johnson, and Webb (1997), for example, report that using the family unit in the United Kingdom would increase the proportion of the population with incomes below half the average by a third compared with household-based measures.

The effect will also vary between countries because of significant differences in the living arrangements of older people. Table 1 shows the proportions of the elderly living with their children. These are high in Japan and southern Europe and very low in the Nordic countries and the Netherlands. In most countries, there has been a substantial decline in co-residence over time. In the United Kingdom, for example, a third of the elderly lived with their children in the early 1960s, twice today's level.

TABLE 4.1. Proportion of Over-65s Living with Their Children

Country	%
Japan	65
Italy	39
Spain	30
Austria	25
France	17
United Kingdom	16
United States	15
Finland	14
Germany	14
Norway	11
Netherlands	8
Sweden	5
Denmark	4

Note: Data for various years between 1987 and 1990

Source: OECD (1994)

OECD (2001) investigates the role of living arrangements in income-distribution outcomes in (its own words) a 'pseudo-simulation.' This illustrates what would happen if other countries were assumed to have the living arrangements of Japan or of Finland, keeping all other attributes of the population unchanged (Table 4.2). Although this is implausible (because living arrangements are highly correlated with other characteristics), it does illustrate the possible scale of effects. Using the example of the United Kingdom, the results show that original incomes would be 50% higher if older people had the same living arrangements as in Japan and pensioners were presumed to share in the incomes of their adult children. After taxes and benefits are taken into account, average net income would increase by 20%.

The Effect of Age

Figure 4.3 shows that pensioner incomes tend to decline with age, with the exceptions of Canada and Australia. Hauser (1997) also reports declining income by age for thirteen countries: the exception in his study is Luxembourg. In six countries—Denmark, France, Germany, the Netherlands, Portugal, and the United Kingdom—the difference in replacement rates between 65–74 year olds and people over age 75 exceeds ten percentage points. There are many explanations for this pattern.

- i) A cohort (date-of-birth) effect. When people reach pension age, their benefit is determined by their past earnings, which will be

TABLE 4.2. Differences in Mean Incomes When Countries Assumed to Have the Living Arrangements of Japan and of Finland, 65–79 Year Olds, Mid-1990s

Changes, percent	Large households (Japan)		Small households (Finland)	
	Original income	After taxes and benefits	Original income	After taxes and benefits
Canada	38	13	–11	–5
Finland	177	18	—	—
Germany	159	9	–3	0
Japan	—	—	–45	–18
Netherlands	8	–4	–2	–1
Sweden	16	3	–1	–1
United Kingdom	52	20	–5	–3
United States	25	7	–7	–4

Source: OECD (2001), Table 2.3

higher for younger cohorts, who tend to have had higher real lifetime incomes than their predecessors.

- ii) Incomplete indexation of past pension benefits to inflation (especially private pensions and annuities).
- iii) Women live longer than men so older pensioners are disproportionately female. Older women tend to be poorer than older men are.
- iv) Pension-scheme immaturity. Where schemes are contribution-based, earlier contributors may not have accumulated sufficient entitlements for a 'full' pension. The United Kingdom is one example. The second-tier state earnings-related pension scheme (SERPS) was only introduced in 1978. Benefits for successive cohorts of retirees peaked only in 1998 so only after twenty years or more will all pensioners have full, mature SERPS entitlements (for periods spent contracted in to the scheme).
- v) The role of earnings among younger pensioners. According to the United Kingdom's Department of Social Security (2000a) earnings make up nearly 60% of the difference in incomes between recently retired single pensioners and single over 75s. Nevertheless, only a small minority has income from earnings: 23% of couples and 16% of single pensioners among the recently retired and 15% and 4% respectively for pensioners of all ages. The pattern of average incomes by age is therefore distorted by a small number of younger elderly who are still working and are relatively well off.

- vi) Decumulation of wealth. If older pensioners have spent down their assets—as the lifecycle hypothesis would imply—then they will have lower incomes from capital than younger pensioners have. (Whether or how much this decumulation takes place is the subject of a long-running debate: see Disney, 1996 for a survey.)

However, there is one counteracting factor: differential mortality of pensioners across income groups. Survivors to old ages will typically have greater financial, housing and pension wealth than pensioners who die young. This composition effect means that older pensioners tend to be the richer of their cohort. Following pensioner incomes across time allows some of the cohort effect to be disentangled from the age effect. Johnson and Stears (1995) find that the average income of each cohort in the United Kingdom in fact increases over time. Differential mortality offsets clear evidence of cohort effects, under-indexation of pension benefits and decumulation of assets.

Australia has the reverse pattern to other countries: older pensioners are richer than younger ones. This probably stems from two unique fea-

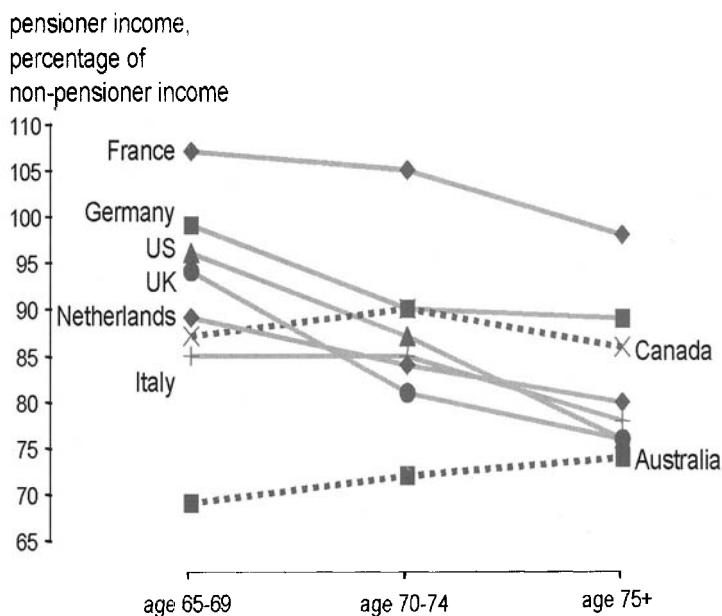


FIGURE 4.3. Pensioner Incomes as a Percentage of Non-pensioner Incomes by Age in Eight Countries, Couples

Source: Johnson (1998), Table 4.2

Note: Data are mainly from between 1995 and 1997, with the exceptions of Germany (1993) and the Netherlands (1993–94)

tures of the Australian retirement-income system (see Bateman, Kingston, and Piggott, 2001). First, most private pension benefits are paid as lump sums. Such lump sums are not counted as income (see section 6). Secondly, the age pension (the public pension benefit) is both income- and asset-tested. This encourages people to dissipate private-pension assets into housing, consumer durables etc., which do not reduce the age-pension entitlement.

The following tables examine pair-wise the correlation of replacement rate rankings across countries for studies that divide replacement rates by age group. There is a further split because Hauser reports results using 'old'- and 'new-OECD' equivalence scales (in his terminology). The first line in each cell shows the correlation coefficient between the replacement rates reported for each overlapping country in the relevant two studies. The significance level, from a standard test, is reported in parentheses. The second line in each cell reports the mean respective replacement rate in the two studies that are compared. The third line reports the number of countries that the two relevant studies have in common. (Note that the means reported in each case are calculated only for the countries that the two relevant studies have in common.) The final line shows the results for the United States.

Comparing the two results from Hauser, the results are highly correlated between countries but the mean replacement rate shifts substantially. The correlations between the OECD studies for the 65–74 age group (Table 4.3) are fairly close, but there is much greater disparity in the findings of the five studies in Table 4.4 for older pensioners. Although the means are similar, the correlations are lower, indicating that the rankings of countries by average replacement rates vary significantly across countries.

INCOME-POVERTY RATES

'Poverty' is a very broad concept and the many dimensions of social exclusion and deprivation can only be captured with a range of indicators. Our focus here is on income as a definition of well-being. We therefore use the term 'poverty' as shorthand for low income while acknowledging that low income as a single measure does not capture all the facets of poverty and deprivation.

There are two basic approaches to defining poverty:

- An absolute standard: either the resources to meet basic needs or to reach the safety-net income specified by the social-assistance system; and
- A relative standard, where poverty is defined in comparison with the living standards of society as a whole.

**TABLE 4.3. Comparison Matrix for Replacement Rates:
Age 65–74, Four Studies**

	Hauser (old scale)	Hauser (new scale)	Whiteford/Kennedy
Förster/ Pellizzarri	Correlation: 0.76 (0.01) Means: 87,92 Observations: 11 US: 99,101	Correlation: 0.80 (0.01) Means: 88,86 Observations: 10 US: 99,95	Correlation: 0.78 (0.01) Means: 89,94 Observations: 10 US: 99,105
Hauser (old scale)		Correlation: 0.99 (0.00) Means: 93,86 Observations: 12 US: 101,95	Correlation: 0.78 (0.01) Means: 95,96 Observations: 9 US: 101,105
Hauser (new scale)			Correlation: 0.79 (0.01) Means: 88,97 Observations: 9 US: 95,105

**TABLE 4.4. Comparison Matrix for Replacement Rates:
Age 75 plus, Five Studies**

	Hauser (old scale)	Hauser (new scale)	Disney/ Johnson	Whiteford/ Kennedy
Förster/ Pellizzari	Correlation: 0.53 (0.10) Means: 71,98 Observations: 11 US: 82,98	Correlation: 0.55(0.09) Means: 78,77 Observations: 10 US: 82,90	Correlation: 0.24(0.60) Means: 82,82 Observations: 7 US: 82,83	Correlation: 0.13 (0.74) Means: 80,86 Observations: 9 US: 82,82
Hauser (old scale)		Correlation: 0.99 (0.00) Means: 87,78 Observations: 12 US: 98,90	Correlation: 0.40 (0.45) Means: 87,82 Observations: 7 US: 98,83	Correlation: 0.41 (0.35) Means: 88,89 Observations: 9 US: 98,82
Hauser (new scale)			Correlation: 0.35 (0.38) Means: 79,82 Observations: 7 US: 90,83	Correlation: 0.35 (0.26) Means: 79,89 Observations: 9 US: 90,82
Disney/ Johnson				Correlation: 0.74 (0.04) Means: 81,87 Observations: 8 US: 83,82

Over the long term, governments have tended to increase the safety-net level of income faster than prices, implying that societies' (or at least governments') views of poverty change over time. Absolute poverty standards are problematic for international comparisons since:

- Basic needs differ between countries;
- The poverty line must be translated into different currencies, while market currency rates are very volatile and even purchasing power parities—which compare the cost of a common consumption basket—are inappropriate, because they aim to equalize the cost of total domestic expenditure and not the consumption of the poor; and
- Countries' average incomes differ. For example, poverty rates measured against a threshold of 50% of average consumption across the European Union varied from under 5% in Belgium, Denmark and the Netherlands to nearly 70% in Portugal (Eurostat, 1990).

The most common measure of poverty in international studies is therefore the proportion of the population with incomes below some ratio of the average (mean or median) income. Two of the studies surveyed here define poor older people as those in the bottom fifth of the overall income distribution (a definition which obviously makes no sense when comparing *aggregate* poverty rates).

Figure 4.4 shows the results from one of these (Johnson, 1998). The intercept of the chart is drawn at 20%, so that bars to the right imply that older people are over-represented among the poor and to the left, that they are under-represented. In most countries, the proportion of older people in the bottom quintile of incomes is close to the 'neutral' level of 20%. Canada shows the highest degree of over-representation. In five countries, however, fewer than one in five pensioners are in the bottom quintile of the population income distribution.

Figure 4.5 shows the same poverty measure from another OECD study. In this paper, older people in all 11 countries shown are over-represented in the bottom quintile of the income distribution. Most, compared to the other studies, are the results for Australia. Also striking are the extremely high poverty rates reported for most of the Nordic countries—Denmark, Finland and Norway—which typically show high replacement rates for older people. (Note that we are unable to rationalize these results and communications with the authors have not elicited an explanation.)

One possible explanation is the Nordic countries' relatively egalitarian distribution of income among the population as a whole compared, for example, with the United States. The ratio of the value of the twentieth percentile of the income distribution to the median and the mean income in some example countries (from Förster & Pellizzari, 2000, Table 2.2) illustrates these differences.

	Sweden	United Kingdom	United States
P20/median	68%	61%	53%
P20/mean	62%	51%	43%

Therefore, while many more pensioners in Denmark are found in the bottom quintile of the income distribution, their incomes will be higher as a proportion of the population average than low-income pensioners in the United States.

Comparing the data in Figure 4.5 with Figure 4.4, the correlation coefficient is -0.08 . Measured income poverty rates for the six common countries are completely unrelated between these two studies (which use the bottom quintile of the overall income distribution as a measure of income poverty).

The remaining studies define income poverty as having an income below half of the population average income. This measure is more robust

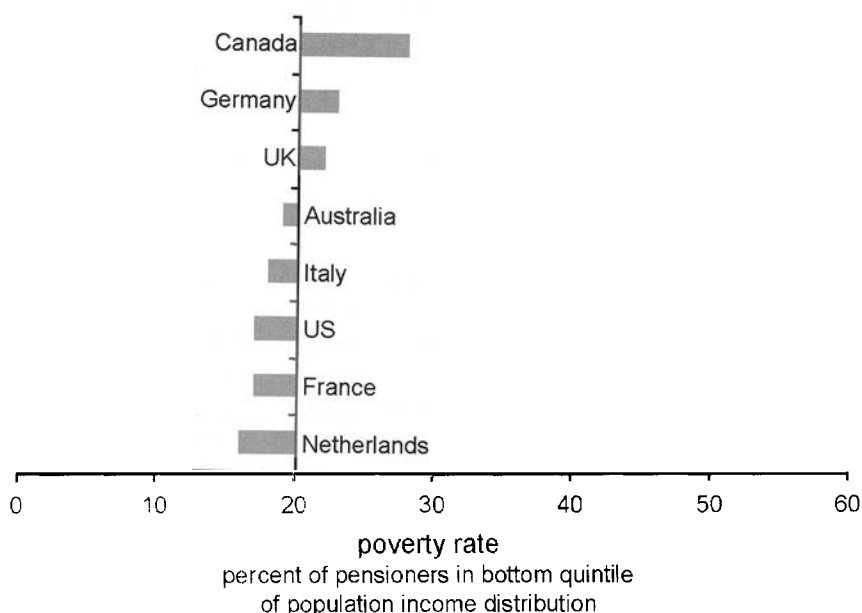


FIGURE 4.4. Pensioner Income-Poverty Rates in Eight OECD Countries: Percentage of Elderly in the Bottom Quintile of the Population Income Distribution

Source: Johnson (1998), Table A1

Note: Uses an equivalence scale of one plus 0.7 per additional adult in an income unit and 0.5 per additional child. Pensioner income units are defined as all family units headed by someone over 65 or someone aged 60–64 who is not working. Data are mainly from between 1995 and 1997, with the exceptions of Germany (1993) and the Netherlands (1993–94)

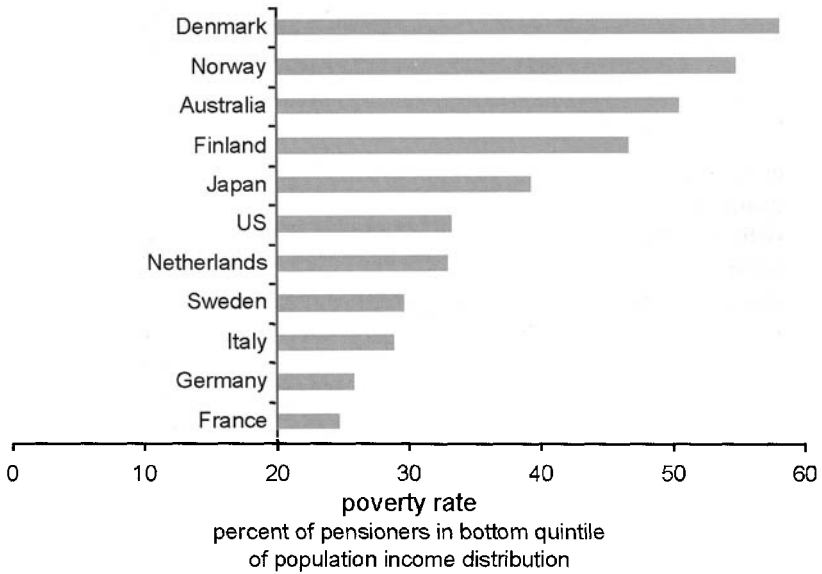


FIGURE 4.5. Pensioner Income-Poverty Rates in 11 OECD Countries: Percentage of Elderly in the Bottom Quintile of the Population Income Distribution

Source: Burniaux et al. (1998), Table 5.3

Note: Data are from 1993 to 1995 with the exception of France (1990)

with respect to changes in the shape of the overall income distribution than the bottom-quintile measure. For example, a higher proportion in the bottom quintile of a more equal income distribution might generate higher measured poverty. However, this might mean that pensioners are relatively better off than their counterparts in a country with a more dispersed distribution of income. The final difference is in the average used. Hauser (1997) uses the mean while others use the median. The mean, of course, leaves the results vulnerable to the effect of outliers and measurement error and produces a higher threshold in countries with a more dispersed overall income distribution.

Figure 4.6 is based on the latest published analysis of the Luxembourg Income Study database. Averaging across the 18 countries shown, 11.4% of older people have incomes below half the median. The income-poverty rate varies from less than 3% in Sweden to nearly 30% in Australia.

Figure 4.7 uses the results of the latest OECD study of income distribution. The average income-poverty rate in this case is 13.9%. These two studies produce quite similar results. The correlation between these two sets of results is close (0.76, significance level 0.00: see Table 4.5). The largest difference is in the poverty rate for Australia, which is reported

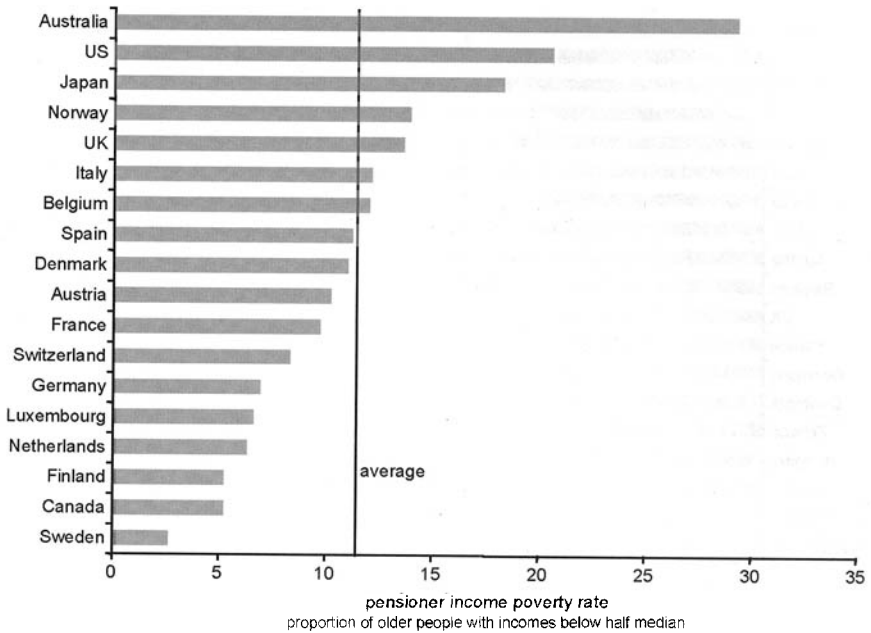


FIGURE 4.6 Pensioner Income-poverty Rates in 18 Countries: Percentage of Pensioners with Incomes Below Half Population Median

Source: Smeeding and Williamson (2001), Table 1

Note: Data are from 1994 and 1995, with the exceptions of Canada and the United States (1997); Belgium, Japan, Switzerland, Denmark (1992) and Spain (1990)

as 16.1% by Förster and Pellizzari (2000), and 29.4% by Smeeding and Williamson (2001).

An income-poverty threshold of half-average income has become something of a standard, but the relative position of different countries can be sensitive to the choice of poverty line. Many studies, recognizing this, provide results with different cut-off points. Comparison of these analyses is unfortunately hampered by the use of different thresholds: for example,

- Smeeding and Williamson (2001) use 40 and 50%;
- Atkinson, Rainwater and Smeeding (1995) use 50 and 70%; and
- Hauser (1997) and Whiteford and Kennedy (1995) use 40, 50, and 60%.

We use Hauser's results as an illustration (Figure 4.8). Naturally, a higher threshold increases measured poverty. An average of 6% of pensioners have incomes under 40% of the population average, 13% are under the 50% threshold and 24% count as poor with a 60% poverty line. Note that countries are ranked by their poverty rates with a 40% cut-off.

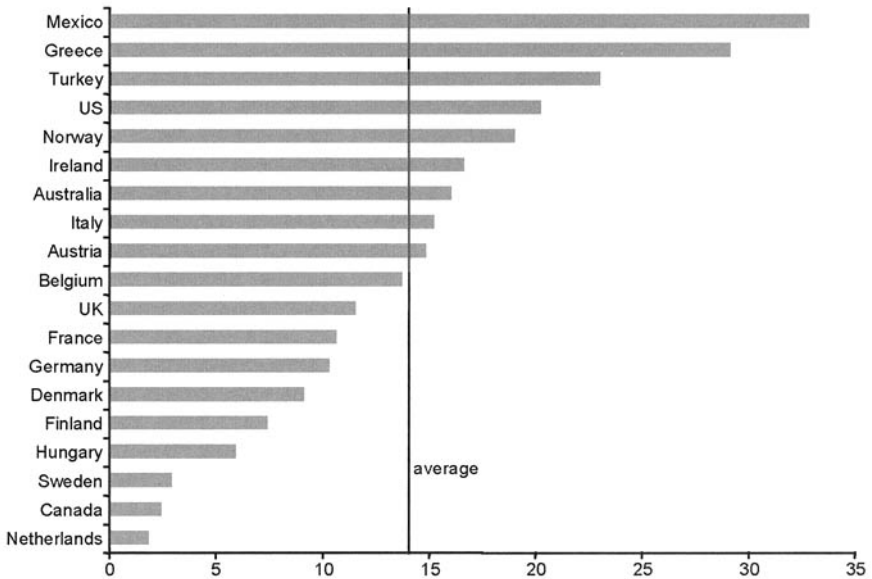


FIGURE 4.7. Pensioner Income-poverty Rates in 19 Countries: Percentage of Pensioner Couples with Incomes below Half Population Median

Source: Förster and Pellizzari (2000), Table 5.4

Note: Data are from 1994 and 1995, with the exception of Austria and Italy (1993) and Hungary (1997)

There are re-rankings in countries' relative poverty rates with different poverty lines. In the United Kingdom, 9% of pensioners have incomes below 40% of average, the fifth highest proportion. However, with a 60% threshold, the United Kingdom has the highest measured elderly poverty rate (at 40%). Similarly, Denmark has the second lowest poverty rate with the lowest threshold but moves up six places with the highest poverty line. Conversely, the United States has the third highest poverty rate with a 40% threshold, falling to fourth highest (50%) and fifth highest (60%). Whiteford and Kennedy (1995) report similar results, again using data from the Luxembourg Income Study. The United Kingdom has the third and fourth lowest pensioner poverty rate with a cut-off of 40 and 50% respectively. However, if poverty is defined as an income below 60% of the average, then the United Kingdom slips to eighth place.

The overall sensitivity of the results to the choice of poverty line can be quite small. In Hauser's study, for example, the correlation coefficients between results at the three different thresholds vary between 0.88 and 0.98, with significance levels of zero to four decimal places. Whiteford and Kennedy's results give correlation coefficients of between 0.51 and 0.91,

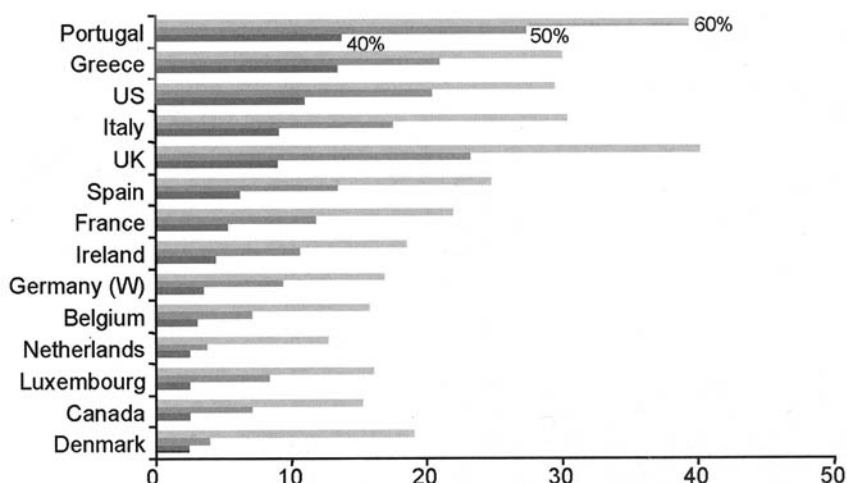


FIGURE 4.8. Pensioner Income Poverty Rates in 14 Countries: Proportion of Pensioners with Incomes Below Specified Proportions of Population Mean

Source: Hauser (1997), Table 7

Note: Data are from between 1989 and 1992, with the exception of Greece (1987–88)

implying a significant difference between the 40 and 60% thresholds ($p=0.1050$). An alternative approach is to use different poverty measures that are less sensitive to the choice of threshold. Examples include the 'poverty index'—the poverty rate multiplied by the mean shortfall of incomes from the poverty line—and the general class of measures that also take account of the degree of inequality among the poor (Foster, Greer, and Thorbecke, 1984).

Finally, Table 4.5 compares the cross-country correlations of poverty rankings over pair-wise comparisons for the six studies that define poverty as having an income below half the average that were presented in the charts above. Five of these analyses are based on the Luxembourg Income Study, the exception being Förster and Pellizzari (2000).

In general, the six papers give similar results. The correlation coefficients for poverty rate rankings across countries are positive and relatively high: some are significant on standard tests. Moreover, mean poverty rates in the countries that change rankings tend to be similar. The income-poverty rate in the United States lies between 20.3 and 25.3% in different studies, but other countries show much more variation.

Most significant is the United Kingdom. Atkinson, Rainwater, and Smeeding and Whiteford and Kennedy report one of the lowest poverty rates for the United Kingdom: the third and fourth lowest respectively

Table 4.5. Comparison Matrix for Poverty Rates: Proportion of Pensioners with Incomes Below Half Average

	Bradshaw/Chen	Förster/Pellizzari	Hauser	Smeeding/ Williamson	Whiteford/ Kennedy
Atkinson et al.	Correlation: 0.30 (0.37)0 Means: 11, 15 Observations: 11 US: 21,25	Correlation: .71 (0.00) Means: 11,11 Observations: 13 US: 21,20	Correlation: 0.49 (0.15) Means: 10,12 Observations: 10 US: 21,21	Correlation: 0.72 (0.01) Means: 11, 11 Observations: 13 US: 21,21	Correlation: 0.94 (0.00) Means: 11,12 Observations: 11 US: 21,25
Bradshaw/ Chen		Correlation: 0.46 (0.13) Means: 14,11 Observations: 12 US: 25,20	Correlation: 0.64 (0.05) Means: 15,13 Observations: 10 US: 25,21	Correlation: 0.69 (0.01) Means: 14, 12 Observations: 13 US: 25,21	Correlation: 0.56 (0.12) Means: 16,13 Observations: 9 US: 25,25
Förster/ Pellizzari			Correlation: 0.69 (0.02) Means: 13,12 Observations: 11 US: 20,21	Correlation: 0.76 (0.00) Means: 11,2 Observations: 13 US: 20,21	Correlation: 0.74 (0.01) Means: 11,12 Observations: 10 US: 20,25
Hauser				Correlation: 0.71 (0.01) Means: 12,11 Observations: 11 US: 21,21	Correlation: 0.52 (0.15) Means: 12,11 Observations: 9 US: 21,25
Smeeding/ Williamson					Correlation: 0.87 (0.00) Means: 12,12 Observations: 11 US: 21,25

(at 7 and 8%). In contrast, Bradshaw and Chen and Hauser suggest a very high poverty rate among British pensioners (36 and 23% respectively). In the former case, we suspect that the main reason for this result is the exclusion of housing benefit from the measure of income. (The authors are not transparent, but they state on page four: 'Excluded from consideration here are the impacts of housing benefits and subsidies . . .') This treatment is unique to the Bradshaw-Chen study; all the other papers surveyed define income as all cash income and 'near-cash' income, where the latter specifically includes, for example, housing benefit in the United Kingdom and food stamps in the United States. Given the importance of housing benefits to poorer pensioners in the United Kingdom—some 17% of all pensioners receive the benefit—it is unsurprising that this treatment has a significant effect on measured poverty rates.

The main idiosyncrasy of the Hauser paper is in the definition of a pensioner: all members (irrespective of their own age) of households headed by someone aged 55 or over in which one or more member receives a pension. The other studies simply count people as elderly using a standard cut-off age and do not count other members of households that contain a pensioner. There are many different effects of this treatment and so it is difficult to isolate which might be responsible for the rather different result for the United Kingdom.

There are two other countries where there are substantial differences between the studies. For Australia, Atkinson, Rainwater, and Smeeding (1995) and Förster and Pellizzari (2000) find percentage poverty rates in the high teens, while the other three papers that cover Australia report figures of around 30%. The reported income-poverty rate for Norway varies between 7 and 19% in four studies.

INCOME INEQUALITY

The two previous sections looked at how pensioners' incomes compare with those of the population as whole. This section focuses on the distribution of income among older people.

Figure 4.9 shows (from the most recent OECD study) a simple measure of income inequality: the ratio of the 90th percentile of the pensioner income distribution to the tenth percentile, called the 90/10 ratio for short. The differences between countries are very large. In the United States, for example, the richest pensioners have incomes more than five times larger than the poorest pensioners, while the ratio is two-and-a-half or less in Australia, the Nordic countries and the low countries (Belgium and the Netherlands). These results are confirmed by Johnson (1998): in the eight countries also covered by the OECD study, the correlation between the results is near perfect (0.99, significance level 0.0000).

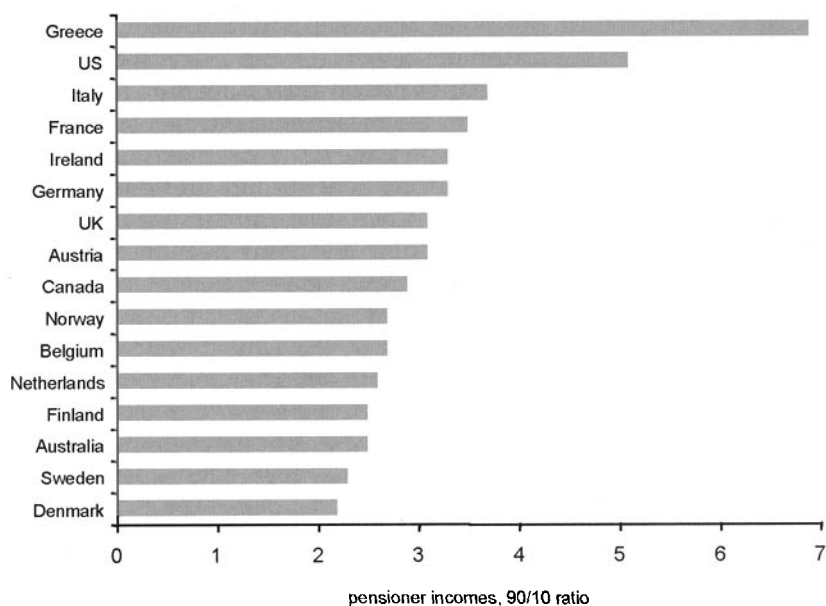


FIGURE 4.9. Pensioner Income Inequality in 16 Countries: Ratio of 90th Percentile of Pensioner Income to 10th Percentile

Source: Förster and Pellizzari (2000), Table 2.2

Note: Data are from 1994 and 1995, with the exception of Italy (1993)

A natural conclusion from Figure 4.9 is that the dispersion of earnings and incomes among people during their working life is continued into retirement. This issue is explored in Figure 4.10, which plots inequality among older people against inequality among people of working age, again using the simple 90/10 ratio as the inequality measure. Fitted values are also shown. On average, pensioner incomes are less unequal than workers' incomes (mean 90/10 ratios are three and three-and-a-half respectively). There is, as expected, a very strong relationship between income inequality at working and pension age. At one end of the spectrum, both workers and pensioners have very unequal incomes in the United States while the Nordic countries are more egalitarian in both cases.

A second explanation for the pattern of pensioner income inequality lies in the structure of pension systems. We would expect redistributive pension systems to result in a relatively egalitarian distribution of pensioner income compared with systems of comprehensive social insurance. An example of the former is the means-tested age pension in Australia. The 90/10 ratio for people of working age is the fifth highest in Australia (at 3.9), while the ratio for people of pension age is the fourth lowest (2.5).

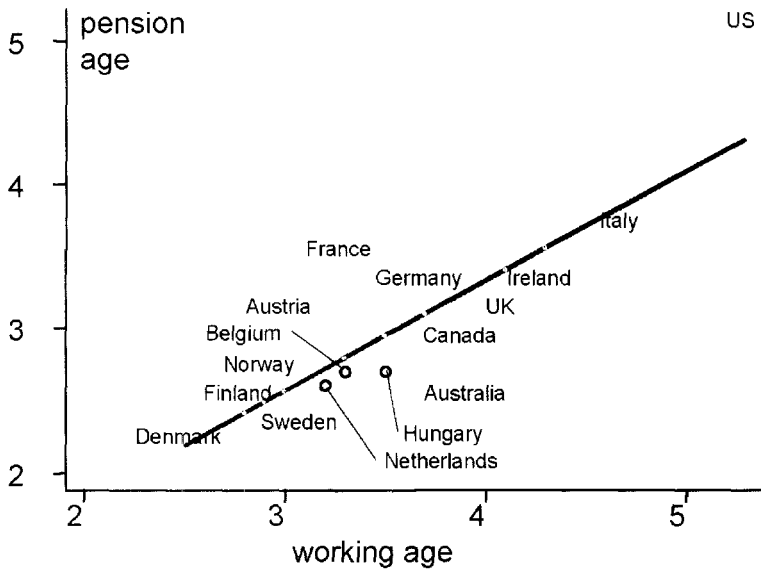


FIGURE 4.10. Income Inequality Among Pension-age and Working-age Populations in 16 Countries: Ratio of 90th to 10th Percentile of Income

Source: Förster and Pellizzari (2000), Table 2.2

Note: Data are from 1994 and 1995, with the exception of Italy (1993). Fitted values are estimated from pension-age ratio = $0.9874 + 0.8655$ working-age ratio; standard errors 0.5568 and 0.1803 respectively

Similarly, Canada, the Netherlands, and the United Kingdom pay mainly flat-rate public pension benefits. The 90/10 ratios for pensioners are lower than we would expect given the distribution of income among workers (since they lie below the fitted-value curve). They are also lower than in Italy and France, which have comprehensive earnings-related public pensions paying larger benefits to higher earners.

Johnson (1998) also produces 90/10 ratios separately by sex, marital status, and age. Typically, the incomes of single men are the most broadly distributed—with the exceptions of Australia and the United Kingdom, where couples' incomes are the most dispersed—but the differences are not large. The pattern is also similar for different age groups. The only exceptions here are Italy, with a large decline in the 90/10 ratio with age, and the United Kingdom, with a modest decline. Johnson also analyzes 60–64 year-olds who are not in work. This age group has vastly more unequal incomes than people over pension age in Canada and the United States. This tends to suggest that there are 'two nations' of early retirees: those forced to retire on low incomes

because of illness or redundancy and those with generous private pensions and early retirement benefits.

These results are a useful complement to the earlier measures. Some countries with low 90/10 ratios often have lower average pensioner replacement rates. This implies that many cross-country differences in the average living standard of pensioners are generated by the incomes of the richest pensioners rather than by the incomes of the majority.

INCOME TRENDS

The previous sections provide 'snapshots' of pensioners' incomes across countries in a single year. We can extend the analysis to look at how these patterns have changed over time. Förster and Pellizzari (2000) provide a broad analysis of the trend in the relative incomes of older people. The data compare the mid-1990s with the mid-1980s. Table 4.7 gives the results as the percentage change in the replacement rate over the decade or so. Pensioners' incomes increased faster than the whole population's did in nine of the thirteen countries. The mean change is a 2% increase in the

TABLE 4.7. Percentage Change in Replacement Rate by Age Group Between the Mid-1980s and the Mid-1990s in 13 Countries

	Change in replacement rate (%)		
	All	Age 65–74	Age 75–
Canada	6.0	8.5	0.7
Denmark	4.0	6.5	1.4
Finland	1.5	1.7	1.1
France	6.3	8.6	1.4
Germany	5.5	8.9	1.2
Greece	–2.9	–5.7	0.0
Ireland	–6.9	–9.2	1.4
Italy	3.0	3.6	1.9
Netherlands	–1.8	–2.9	0.8
Norway	4.3	8.6	2.3
Sweden	3.9	6.4	–1.6
United Kingdom	5.4	8.0	1.0
United States	–0.7	–0.3	0.9

Source: Authors' calculations based on Förster and Pellizzari (2000), Table 2.3

Note: Absolute percentage point changes in the replacement rate have been transformed to (relative) percentage changes. Data for all pensioners derived from results disaggregated by age using 1990s levels and 1980s-to-1990s changes in population shares to provide the relevant weights

replacement rate. Older people in Canada, France, Germany and the United Kingdom enjoyed large gains with increases of over 5% in the replacement rate. The sizeable decline in pensioners' relative incomes in Ireland is probably a reflection of the rapid growth of the economy, which has seen large increases in earnings.

Income changes in virtually all the countries vary significantly between the two age groups of 'younger' and 'older' pensioners. In nine of the thirteen nations, gains are larger for younger pensioners than for the over 75s; in several countries significantly so. This may arise from the growth of private benefits, real wage growth (affecting incremental replacement rates) and other cohort effects.

INCOME-DISTRIBUTION OUTCOMES AND THE STRUCTURE OF PENSION SYSTEMS

We began the paper by observing that industrialized countries have very different pension systems. How do the retirement-income outcomes outlined in the previous sections relate to the structure of these pension systems?

Pension systems are extremely complicated and comparing them is consequently very difficult. Figure 4.11 shows a simple measure of the structure of pension systems. It projects mandatory pension values for people with different earnings levels based on today's rules. The charts look at full-career workers earning various proportions of the economy-wide average: half, average, one-and-a-half times, and twice mean pay. The vertical axis shows the corresponding individual pension value as a percentage of economy-wide average earnings. This simple measure reveals many of the important differences between countries' pension systems.

In Italy, the public pension scheme has a high ceiling. It is designed to achieve a great degree of earnings replacement, even for high-income workers. A similar effect is achieved by the statutory occupational pension system in Finland and the quasi-mandatory occupational schemes in the Netherlands and Sweden. The Dutch and Finnish systems have no ceiling to benefits; in Sweden, the ceiling is very high. Korea's severance pay scheme also has no ceiling. In these countries, there is some additional protection for low-income workers, but over much of the income range, projected pension values are linear.

At the other end of the spectrum, the philosophy of the Canadian and British systems is very different. These systems are more redistributive. They ensure that all pensioners achieve a basic standard of living rather than aiming to give everyone a certain level of earnings replacement. This has led to development of extensive voluntary private coverage,

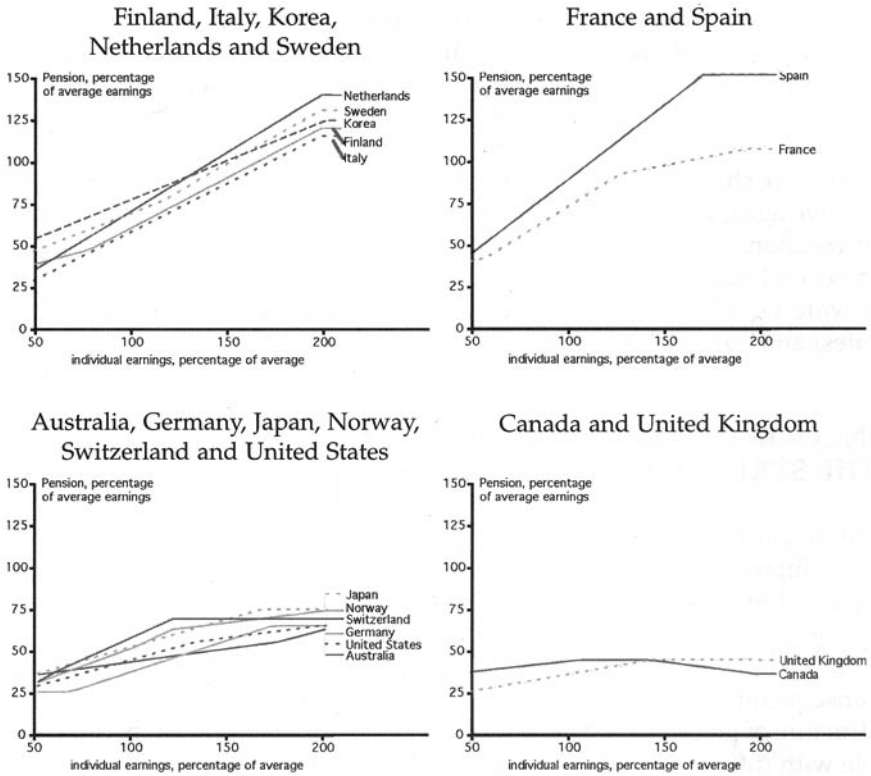


FIGURE 4.11. Projected Pension Values as a Proportion of Economy-wide Earnings for Workers Earning between One-half and Twice Average

Source: Whitehouse (2002b)

particularly among higher-income workers. Both countries have mandatory earnings-related public schemes, but these have low ceilings and relatively low accrual rates.

France and Spain look similar to the first group of countries (over this income range, at least). Their pension systems are focused on a comprehensive-insurance objective, but ceilings are lower than they are in the countries in the first panel of the Figure.

Six countries make up an intermediate group. In Germany and the United States, the public pension systems have a redistributive formula, giving higher replacement rates to lower-income workers. Australia and Switzerland have systems of mandatory contributions to private pension plans at quite low levels along with sizeable basic pension programs. The two-tier Japanese public scheme is similarly redistributive.

We observed earlier that the structure of pension systems probably explains the degree of inequality among pensioner incomes relative to inequality among the working age population. However, there is no systematic relationship between the structure of mandatory pension benefits and the other basic measures of economic well-being: the replacement rate and the poverty rate. For example, Canada and the United States typically have the highest replacement rate. But their public pension schemes are much less generous than Italy's, which has a replacement rate near to the average.

Voluntary retirement-income provision explains the contrast between the structure of public-pension systems and retirement-income outcomes. In particular, we believe, the more redistributive public schemes "leave space for" the development of private pension plans for middle- and high-income workers.

This is illustrated in Figure 4.12, which shows the proportion of income deriving from the state (pensions and other benefits). Countries are ranked by the overall average proportion of older people's income from state sources. Unsurprisingly, poorer pensioners everywhere rely on the state for the vast majority of their income. The comprehensive social-insurance schemes in France, Germany and Italy mean that the richest pensioners still get the majority of their income from the state. Indeed, the proportion in France and Italy is only slightly below the proportion for the bottom income quintile. In the other countries, there are predominantly flat-rate public pension systems, or earnings-related public schemes with highly progressive formulae. In Australia, Canada, New Zealand, and the United States, only around a fifth of the income of the richest quintile of the elderly derives from public pension programs. These results—confirmed by other studies, such as Disney, Mira d'Ercole, and Scherer (1998), Börsch-Supan (1997), and OECD (2001)—show the substitutability of publicly provided benefits and private sources of retirement support.

There is much less variation in retirement-income outcomes (at least as measured by average income-replacement rates and prevalence of poverty) than structural differences in pension systems might imply. The OECD (2001) has described this result as 'convergent outcomes, divergent means.'

INCOME CONCEPTS

The data underlying the results surveyed here are based on similar concepts of income. This comprises earnings, public transfers, investment incomes, private pensions, *etc.* Typically, the studies exclude all (or at least some kinds of) capital gains, because the receipt of a capital gain in

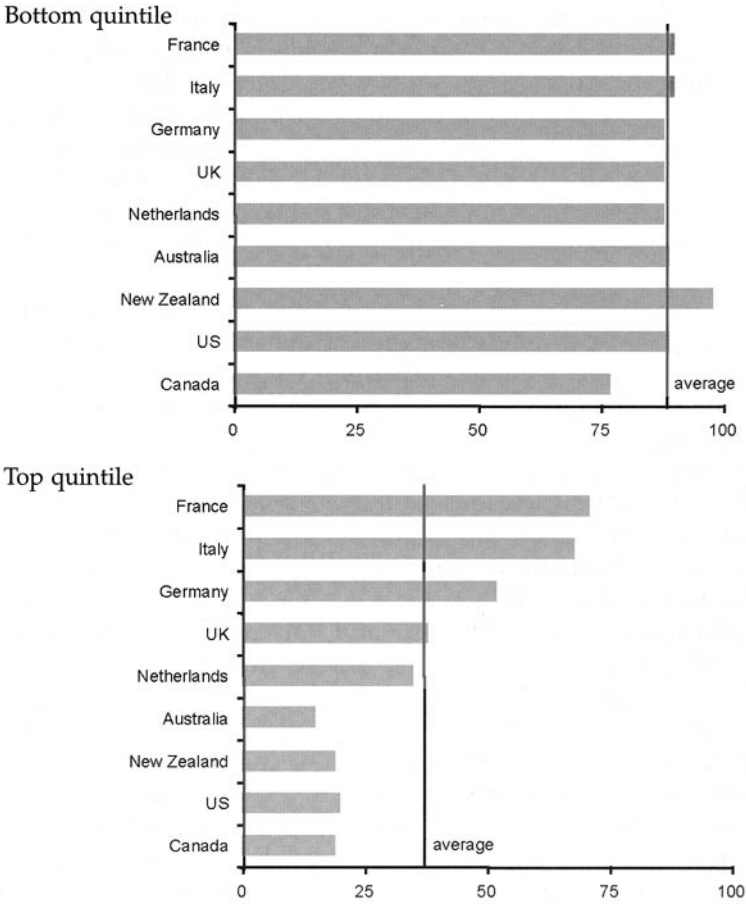


FIGURE 4.12. Percentage of Pensioners' Income From Public Pensions and Other State Benefits by Quintile of the Income Distribution, Nine Countries

Source: Disney and Johnson (2001)

a particular period reflects the accrual of gains over the period an asset was held. Including such gains would artificially broaden the income distribution. Incomes in kind are also excluded, as are lump-sum distributions from private pensions.

This raises significant questions concerning the definition of economic well-being and, in particular, the treatment of financial assets and housing wealth. This is particularly pertinent for pensioners who are (or should be, according to the standard lifecycle hypothesis of consumption) dis-saving at this point in their life.

Capital Income and Financial Wealth

The standard 'statistical' measure of income used in distributional analyses differs from a desirable 'economic' measure. The Haig-Simons (economic) definition is the change in net economic wealth between two points in time plus consumption in that period. Hicks (1946) defines income as 'the maximum amount of money which the individual can spend this week, and still expect to be able to spend the same amount in real terms in each ensuing week.' The difference between the two relates to non-recurring sources of income.

The standard statistical measure is an approximation to the economic definition, but it differs in two important respects. First, it ignores capital gains. Secondly, it does not take account of the effect of inflation. It makes little sense to say that income is the amount one can spend in a period leaving the *nominal* rather than the *real* value of wealth intact. Yet, the standard measure typically includes nominal capital income.

To illustrate, pensioners' investment incomes fell by nearly a fifth between 1992 and 1994–95. But during this period, interest rates fell from 15% to less than half that level and inflation fell from a peak of nearly 11% to less than 3%, leaving real interest rates fairly stable. This implies that the measured decline in the level of investment incomes overstates the change in economic income according to the Hicksian criterion. It would not be possible to spend nominal interest income without reducing the real value of wealth. There are similar distortions in comparisons between countries with different inflation rates.

The Hicksian definition has one undesirable characteristic: it assumes that people's command over resources is limited such that the current stock of wealth is left when they die. (The Hicksian definition underlies the permanent income hypothesis of consumption and saving behavior, which explicitly assumes that people have infinite lives.) However, it is reasonable to suggest that pensioners might finance some of their consumption from running down their wealth. This process is automatic in pension schemes that provide annuities (that is, all public and most private plans). The payment stops when the beneficiaries die and net wealth in the scheme is then obviously zero.

Most other assets, however, are not in the form of annuities, and it may be that the decision to hold part of wealth not in the form of annuities arises from some form of bequest motive. Nevertheless, the stock of wealth represents command over resources that a pensioner *could* spend if she or he so wanted. Moreover, if bequests are altruistic, then presumably elderly donors derive some utility from the knowledge that their pet charity or relative will benefit after they have passed on. If bequests are strategic, then pensioners enjoy some non-pecuniary return (Bernheim, Shleifer, & Summers, 1985).

This invites a comprehensive measure of command over resources that asks: 'how much can people safely spend in a period and expect to have net wealth of zero when they die?' More formally, this measure can be defined as the sum of non-capital income plus initial period wealth times the annuity rate. To examine how this affects income at each age, we utilize age and sex-specific annuity rates to construct an annuity value of wealth (see Disney & Whitehouse, 2001, pp. 75–78 for full details). Data on average holdings of financial assets from a number of countries are drawn from Disney, Mira d'Ercole, and Scherer (1998).

Table 4.8 shows wealth as a ratio to income in the first four columns, split by marital type and between pensioners and older workers. Among the pensioner units, the wealth-to-income ratio is the highest in Australia: single pensioners have assets worth over six times their income; couples, five times. The average across all the countries shown is around 2.5 for both single pensioners and couples, with Japan and the United States also showing high levels of wealth relative to income. The final two columns indicate the effect of including the annuity value of wealth in the income measure. This increase at age 67 is the annuity rate at that age (7.8%) less the return on assets already counted as income (which we have arbitrarily taken as 5%). The average change is a 7% increase in pensioners' command over resources, with significant variation between countries. For example, Australia has a relatively low pension replacement rate but high wealth-to-income ratios, so a broader concept of command over resources puts it closer to other countries. Partly because of fiscal incentives and partly for historical and cultural reasons, most occupational pensions in Australia are drawn as lump sums rather than an annuity. Australian pensioners clearly must finance their consumption by running down their assets: a form of self-provision of an annuity. Compare this with another country, the United Kingdom, say, where most occupational-pension benefits have to be taken as an annuity. Income would be higher and asset holdings lower on standard measures even if the economic position of older people in the two countries were the same. The measure of comprehensive command over resources equalizes the treatment of these two different systems of pension provision. Crystal and Shea (1990) performed a similar exercise on United States data, which showed an increase in the measured replacement rate for older people from 103 to 124% once the annuity value of wealth was taken into account.

Housing

Many pensioners have a far more valuable asset than their financial wealth in the shape of their own home. Indeed, for many older households housing wealth is the major asset other than social-security or private-pension

wealth. Owner occupation yields a flow of services that should, in principle, be treated as an income flow, usually called an 'imputed rent.'

Table 4.9 shows the extent of home ownership by income across a number of countries. Owner-occupation rates are very high in Australia and the United States and high in Canada, France, and the United Kingdom. Elsewhere in Europe, they are significantly lower, especially in the Netherlands. In addition, many home-owners still have a mortgage on their property in Germany and the Netherlands. To the extent that

TABLE 4.8. Financial Wealth as a Proportion of Income and Effect on Income from Annuitization

	Wealth/income ratio		Increase in income
	Age 55	Age 67	
Australia	2.1	5	14%
France	1.5	3.7	10%
Germany	0.5	1.2	3%
Italy	1.3	2.8	8%
Japan	1.7	3.8	11%
Netherlands	0.4	0.9	3%
Sweden	-0.1	0.7	2%
United Kingdom	0.7	1.3	4%
United States	1.5	3.2	9%

Source: Disney, Mira d'Ercole, and Scherer (1998), Table 4.9

Note: Data are from between 1992 and 1995, with the exceptions of the United Kingdom (1988-89) and the Netherlands (1990)

Table 4.9. Pensioners' Housing Tenure by Income Quintile in Eight Countries

	Bottom quintile			Middle quintile			Top quintile		
	Rent	Mortgage	Own	Rent	Mortgage	Own	Rent	Mortgage	Own
Australia	20	2	78	21	4	75	13	6	81
Canada	42	9	50	23	10	66	21	8	71
France	34	3	62	38	5	57	21	7	72
Germany	63	5	32	64	7	29	37	21	42
Italy	35	4	62	36	3	61	34	3	63
Netherlands	57	11	33	81	7	12	47	26	26
United Kingdom	46	4	50	47	5	48	10	15	75
United States	30		70	15		85	10		90

Note: 'Own' means owned outright except in the United States where it is not possible to separate people who own their home outright from people with a mortgage

Source: Disney and Johnson (2001); authors' tabulations of British Household Panel Survey

housing wealth represents an additional implicit annuity stream, pensioners in the Anglo-Saxon countries are better off than income-based calculations would imply.

Table 4.10 shows estimates of the value of housing wealth relative to income in a range of countries. Housing wealth is generally much larger for people over retirement age than it is for people of working age. High property prices in Japan and the value placed on home ownership mean that housing wealth is particularly significant there.

The 'asset-rich, income-poor' phenomenon that has exercised some commentators seems particularly pertinent with housing wealth, especially where the tax (and means-test) treatment of retirement-income streams invites individuals to hold their assets in the form of housing. Nevertheless, there are difficulties in simply treating housing as wealth that could be potentially annuitized. Housing is also a consumption good and pensioners are often reluctant to move from their family home (Venti & Wise, 1990; Megbolugbe, Sa-Aadu, & Shilling, 1999). Housing wealth may prove a constraint on current living standards rather than simply a source of additional imputed income.

Nevertheless, it would be useful to know what is the annuity value of this housing wealth, and how its use would affect the incomes of pensioners and the poverty rates among pensioner households. Hancock (1998) provides an illuminating account of this in the United Kingdom. Her calculations suggest that the proportion of pensioners (home-owning pensioners) that would gain at least £130 a year from annuitisation of housing wealth rises with age: from 18% (28%) of single men aged 65 or over, to 28% (45%) of single men aged 70 or over and to 44% (75%) of single men aged 75 or over. This is simply because the annuity rate increases with age. However, converting housing equity into an annuity implies the

TABLE 4.10. Mean Housing Wealth to Income Ratios in Eight Countries, Mid-1990s

	Under retirement age	Over retirement age
Finland	2.1	3.2
Germany	2.8	4.5
Italy	2.1	3.0
Japan	4.2	8.9
Netherlands	1.2	1.6
Sweden	2.1	1.7
United Kingdom	2.6	3.9
United States	1.5	3.0

Source: OECD (2001), Table 2.6

existence of a competitive and secure equity-release sector. But this market has remained rather thin in both the United Kingdom and elsewhere.

The most common form of equity release practiced by older households is therefore through downsizing and changes in tenure status. A number of studies have examined the relationship between house moves and 'excess' housing costs, measured in either physical units or monetary terms. The presumption is that moves are more likely where the house is 'inappropriate' to the size of the family or when there are changes in economic status (such as retirement).

The results of these studies are mixed. Ermisch and Jenkins (1999) find some evidence that retired people in the United Kingdom who move do physically reduce their living space. Evidence from the United States shows that some households move to rented accommodation after retirement as a way of releasing housing equity for consumption (see, for example, Feinstein & McFadden, 1989). But in the United Kingdom, more older households switched from rental to owner occupation than made the reverse move in the late 1980s, perhaps because of 'right-to-buy' policies in local authority housing. Moreover, Disney, Henley, and Stears (2002) find no evidence that 'excess' housing budget shares, relative to income, were associated with household moves in the late 1980s. This was perhaps because this was a period of falling house prices that induced elderly households to 'sit tight.' However, that paper does show that moving by elderly households was associated with an increase in financial assets, indicating some evidence of 'equity release' as a motive for moving.

Cross-country comparisons of the value of housing equity (Smeeding et al., 1993; Whiteford and Kennedy, 1995) suffer from two main problems. First, they combine the value of direct subsidies to social rented housing with the value of home-owners' equity. Although both of these relate to housing, they are very different economic issues. Secondly, the data are far from ideal. In most cases, the value of housing equity has to be imputed from a different dataset and matched into the Luxembourg Income Study by age and income. People are then simply assumed to earn a fixed rate of return on the value of housing equity.

Housing wealth is an important determinant of the standard of living for many older households: its use, for example, could reduce significantly measured poverty among very elderly households outside the poorest quintile. Nevertheless, the equity-release market is thin. The evidence that pensioner households use house moves to release equity is strong, but many elderly households are reluctant to move at all, even when they have high potential values of housing equity. Large houses (relative to income) are both a blessing and a curse.

CONCLUSIONS

This paper has surveyed the results of a dozen recent papers on the relative living standards of older people in a number of OECD countries. The main findings are:

- Average pensioner incomes range from 73% of average population incomes in Denmark to over 90% in Canada and the United States (the 'replacement rate'). Allowing for travel-to-work and other costs, and adjusting for differences in family size and composition, pensioners probably have a similar standard of living to their younger counterparts.
- Single women pensioners tend to be worse off than couples, especially if they live alone. Living arrangements differ widely.
- Younger pensioners generally have higher incomes than older pensioners, except in Australia, where the age pension is means-tested and private pensions are mostly taken as lump sums.
- Correlations of cross country rankings of replacement ratios across countries show positive, but not always significant coefficients. Different data sets, methodologies and time periods give different results.
- There is disagreement across studies as to what fraction of pensioners are 'poor', and how these rankings differ across countries. The rankings are sensitive to where the poverty line is set. Another important determinant of the poverty rate is the degree of inequality of incomes of the *working* population.
- Replacement rates for pensioners increased between the mid-1980s and the mid-1990s in most countries, with younger pensioners faring better than older pensioners. Again, however, several countries go against the trend.
- Pensioner income inequality varies substantially. This reflects differences in inequality in society as whole: the United States has an unequal distribution of income among both the pension-age and working-age populations, while the Nordic countries have a relatively egalitarian outcome at both ages.
- Countries have adopted a range of different mandatory pension systems, which differ particularly in the degree of emphasis on insurance and redistributive objectives. There is no systematic relationship between the structure of pension systems and measured replacement rates because of the role of private retirement-income provision. However, pension systems do seem to affect income inequality among pensioners.
- 'Income' in these studies typically comprises income from earnings, pensions (both public and private) and investment income. But many

pensioners have other forms of wealth, notably financial and housing wealth. Pensioner households can spend more than they receive by drawing down ('annuitizing') this wealth.

- Many older households, however, do not run down their wealth, either by choice (for example, a bequest motive) or because it is illiquid (home ownership). Should the annuity value of this wealth be added to measured income in assessing pensioner well-being? We illustrated the range of impacts to measured income that arise from incorporating the annuitized value of wealth into the calculations and discussed some practical issues that arise when pensioner households try to adopt such a strategy.

Future work might exploit data sets that track individuals over time. At present, few studies consider whether pensioner poverty is *persistent*, although longitudinal data sets such as the Health and Retirement Survey (HRS) and AHEAD are increasingly being used for this purpose in the United States. Such data sets are expensive to collect and assimilate, and European countries have been slow to follow the American lead. However the European Community Household Panel (ECHP) offers data collected on a comparable basis for a range of EU countries that has not been exploited to a great extent (Nicoletti & Peracchi, 2001).

A potentially exciting innovation arises from panel studies that are being developed or already 'in the field' that collected data both on the economic and health status of panels of households close to or after retirement age. Surveys such as the English Longitudinal Survey of Ageing (ELSA) and the Survey of Health and Retirement in Europe (SHARE) are now underway. These studies, closely matching HRS and AHEAD in the United States, should permit more sophisticated comparable analyses of the dynamic determinants of well-being of older people, matching economic measures of 'well-being' to underlying measures of morbidity, disability and general health. The goals of greater understanding of the evolution of well-being of older households, and the potential for genuinely interdisciplinary research, will be greatly enhanced by these developments.

NOTES

* Disney is Professor of Economics at the University of Nottingham, a director of Axia Economics and a Research Fellow of the Institute for Fiscal Studies. Whitehouse is a director of Axia Economics, joint manager of the World Bank's pension reform primer program and Visiting Fellow in the School of Economics at the University of New South Wales.

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Correspondence: Axia Economics, 38 Concanon Road, London SW2 5TA United Kingdom; e-mail edward.whitehouse@axiaecon.com or richard.disney@axiaecon.com; web: <http://www.axiaecon.com>.

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CHAPTER 5

Measurement of Late-Life Income and Wealth*

JAMES P. SMITH
RAND

This essay discusses recent innovations in the measurement of income and wealth in social science surveys, with a particular emphasis on how these new techniques may have improved measurement for older households. There has never been much dispute that knowing the economic resources available to older households is critical for understanding their ability to live meaningful and productive lives. But much more skepticism exists about the ability of social science surveys to accurately measure those resources.

Until recently, very little was known about the wealth of the elderly. This was unfortunate since household wealth is an important complementary measure of their command over economic resources. Moreover, compared to households at other ages, the elderly have a lot of it. The principal difficulty was the absence of high quality data on the wealth holdings of older people. This problem has been partially remedied during the 1990s by the availability of an important new data resource—the Asset and Health Dynamics of the Oldest Old (AHEAD).¹ AHEAD has fundamentally changed our knowledge about wealth holdings of older Americans by demonstrating that the collection of high-quality household wealth data was both desirable and feasible. In addition to containing sufficient sample sizes for the elderly population, AHEAD is unique in its integration of high quality economic modules alongside in-depth information about respondents' health, family structure, and cognition. Along with its companion survey, the Health and Retirement Study (HRS), AHEAD incorporated a number of innovations in the collection of household wealth data in a survey setting that I will discuss in this essay. These innovations include the use of unfolding brackets, methods of dealing with anchoring of responses, adding comprehensive measures of wealth, and techniques that aim to reduce measurement error in a panel setting.

Improvements in income measurement among older households have lagged behind those that have been developed for household wealth. In the last few years the attention of survey designers and researchers has returned to the question of how to better measure household income. In particular, two recent innovations appear to be extremely promising. The first deals with the impact of integrating measures of income from assets with questions about the existence and amounts of assets held by the household. The second concerns the best periodicity of receipt in which to ask questions about income.

In this Chapter, I deal with questions surrounding the measurement of household wealth and household income. For both of these topics, the impacts of the major new survey innovations on improvement the quality of measurement are discussed. Finally, I discuss my conclusions.

THE MEASUREMENT OF HOUSEHOLD WEALTH

Until recently, there was much skepticism about the ability of survey data to provide information on household assets, particularly for an older population. The view was widespread that older individuals would either refuse to provide such information, finding the questions too sensitive, or that they simply did not know the answers. Most important, there were no successful survey models to cite to counteract this skepticism. This pessimistic view led to a situation where most economic and health surveys simply did not even try to incorporate questions about household wealth.

Many of the recent innovations involving how to best measure household assets are components of the AHEAD or HRS surveys. During its baseline in 1993, AHEAD included 6,052 households (8,222 individuals) with a least one individual born in 1923 or earlier (that is age 70 or more during the baseline year). In terms of substantive content, AHEAD focuses on the key concerns in this age group—the relationship of life cycle changes in physical and cognitive health in old age to dis-saving and asset decline. Individual respondents were followed-up at two-year intervals.

HRS is a national sample of about 7,600 households (12,654 individuals) with at least one person in the household born between 1931 and 1941 (51–61 years old at the interview date). At baseline, an in-home, face-to-face interview of some ninety minutes was conducted starting in the spring of 1992 and extending into early 1993. Given its focus on the pre-retirement years, the principal objective of HRS is to monitor economic transitions in work, income, and wealth, as well as changes in many dimensions of health status.

A distinct advantage of AHEAD and HRS compared to other surveys of older populations is that a very comprehensive and detailed set of

questions was asked to measure household wealth. Besides housing equity, household assets were separated into the following eleven categories: other real estate; vehicles; business equity; IRA or Keogh; stocks or mutual funds; checking savings or money market funds; CD's, government savings bonds or treasury bills; other bonds; other assets; and other debt. In addition to comprehensive coverage of income sources, there were several innovations that lead to improved measurement. These innovations included the use of unfolding brackets, anchoring, and the use of callbacks in a panel setting.

Unfolding Brackets

Perhaps the most important new survey technique that enhanced data quality on household wealth is the use of unfolding brackets. A persistent problem in household surveys that requested information about the values of assets involved very high levels of item non-response. Originally, this was thought to indicate a great reluctance to reveal sensitive information about household's financial status, but it is now believed to reflect mostly uncertainty about precise values. Unfolding brackets helped deal with that uncertainty by asking respondents who answered wealth questions with a 'do not know' or 'refuse' a series of sequential questions requesting that they place the values of their assets within certain pre-specified limits. More concretely, unfolding brackets take the form of simple questions that follow immediately after a "don't know" or "refuse" response to determine the interval in which the respondent's assets lie. A typical sequence would be as follows. First, ownership status is obtained with allowable responses of "yes," "no," "don't know," or "refuse." Next, respondents reporting asset ownership are asked about total value: possible responses are a dollar amount, "don't know," or "refuse." Respondents in the last two categories are then asked a set of "is it more than x" questions that placed their asset values within categorical limits (unfolding brackets). Any time in this sequence of bracket questions, respondents could give a refusal or a don't know response, thus ending the sequence.

Table 5.1, derived from Juster and Smith (1997), provides an assessment of the impact of the use of unfolding brackets on item non-response to wealth questions among households who own an asset. The 'exact data report' column entries in this table give the percent of owners who reported an exact value amount—the complement of missing exact values is listed in the next column. The reason for the general concern about item non-response to wealth questions is apparent. Missing values to questions on asset values are widespread, reaching as high as more than 40 percent for business equity, bonds, and stocks.

**TABLE 5.1. Response Rates for Owners Only in AHEAD
(Percent of Total)**

Variable	Exact Data Report	Exact Data Missing	Unfolding Brackets	No Information	Column 3/ Column 2
House	78	22	20	2	.91
1st Mortgage	86	14	13	2	.87
Other Real Estate	74	26	21	4	.84
Vehicles	83	17	15	2	.88
Business Equity	59	41	36	5	.88
IRA & Keoghs	74	26	19	7	.73
Stocks	55	45	37	8	.82
Checking- Savings	68	32	25	7	.78
CDs, Treasury Bills	62	38	28	10	.74
Bonds	59	41	31	10	.76
Other Savings	70	30	25	6	.81
Other Debts	86	14	12	2	.86

Source: Juster and Smith (1997).

Table 5.1 also demonstrates that the effects of using brackets on the extent of item non-response were quite dramatic. The third column in Table 5.1 provides the fraction of respondents who provided information about their asset values within the bracketed categories, while the fourth column lists the remaining item non-responses (excluding the bracket responses). The final column gives the fraction of missing exact values for which there is at least a bracketed response. As a general rule, more than three-quarters of item non-responses to asset questions provided at least some information on the value of their assets by the use of brackets. For example, unfolding brackets converted a 45% full item non-response in stock value in AHEAD to only 8% of cases with no information on value.

This large conversion rate to the bracketed response categories indicates that most respondents are not refusing to reveal this information. Instead, they are mostly uncertain about the precise values of their assets, but feel comfortable in assigning values within pre-specified ranges. There is a substantial difference in the willingness to provide bracket responses between respondents who originally said that they did not know ('DK') and those who refused ('REF') to respond. Almost 90% of initial DK responses provided some type of bracketed response. In contrast, more than half of those initially responding REF on a specific item typically refused to provide any additional information about that asset.

While the use of unfolding brackets provided information about the distribution of asset values, another concern was whether it reduced the probability of reporting exact data to subsequent questions about asset val-

ues in order for respondents to avoid the repeated task of providing specific values. While this is plausible, the evidence that exists actually goes in the opposite direction. Respondents who used brackets early tended to provide exact responses later. Respondents may have learned from the bracket questions that a rough approximation to asset value is sufficient.

Follow-up bracket questions clearly persuaded many initial non-respondents to provide ranges for their asset values. The second value of unfolding brackets is that they provide a more reliable estimate of what the actual value of the asset is. Without unfolding brackets, survey designers typically imputed missing asset values. These imputations treated non-responses as if they had the same assets as exact-answer respondents with similar personal attributes. Statistically, this is equivalent to assuming that non-response is ignorable—that is, conditional on the covariates used in imputation, non-response is random.

Since those with assets of higher value are much more likely to have been non-responders to questions on asset value, this assumption of ignorable non-response is unlikely to be correct. When exact-answer cases are compared with those who responded using brackets, the bracketed responses were much more heavily weighted toward the upper end of the asset value distribution. Because they provide mileage in dealing with non-ignorable non-response (an especially important issue for wealth), unfolding brackets are an important tool in obtaining more accurate asset values in a survey setting.

The value of unfolding brackets for estimating asset values is two-fold. First, instead of providing an exact number for the missing value, unfolding brackets provide a range within which the missing value must lie. While this is not the same as having a precise value, knowing that an asset value lies between, \$350,000 and \$500,000 is extremely useful information. The second reason unfolding brackets are useful is that those respondents who answered asset questions using unfolding represent a much better pool of respondents to use in order to impute asset values to those respondents who provided no information at all on their asset values.

In an important paper, Juster and Smith (1997) computed the impact of unfolding brackets in assigning asset values to respondents. The impact of having unfolding brackets was very large. For example, they estimated that among AHEAD respondents with unfolding bracket information, mean business equity was more than \$112,000 larger when the brackets were used in imputation than when they were ignored. Over all respondents, the use of unfolding brackets produced significantly higher estimates of wealth holdings among the elderly. Juster and Smith (1997) show that estimated mean non-housing wealth is 9% larger due to the use of unfolding brackets in AHEAD.

While the use of unfolding brackets results in a significant enhancement in data quality, some unfolding bracket sequences may be better than others. For example, putting all the threshold levels in the brackets at very low or high values would not sufficiently discriminate among respondents. The statistical question is what set of threshold value amounts should one use to maximize the information contained in a fixed and limited set of brackets. The general idea is that the optimal breakpoints should be set to maximize explained variance in a one-way analysis of variance where the number of categories equals the set of bracket categories. This issue was investigated in depth by Hill, Heeringa, and Howell (1994) who used this statistical approach to select "optimal breakpoints." These revised breakpoints were then used to set the threshold value in the brackets, starting with the second wave of AHEAD and HRS.

Anchoring Effects

Subsequent to the evidence that unfolding brackets had a significant impact in reducing item non-response and in improving estimates of the value of assets, a question arose about the possibility that there may be 'anchoring' effects introduced by the use of unfolding brackets. Anchoring refers to the possibility that respondents may make inferences about the true state of the world from the specific phrasing of the question. If respondents, for example, were asked about the size of their checking and savings accounts, they may be influenced by whether the first question in the unfolding sequence began with "is the value more than \$100" or whether the first question was "is the value more than \$10,000." When there is uncertainty about what the 'right' answer is, a sequence that starts with \$100 may convey the impression that small numbers are more likely to be correct than large numbers, while a sequence starting with \$10,000 may give the opposite impression—that large numbers are more plausibly correct than small numbers.

This concern about the possibility of such anchoring effects was abetted by evidence from the cognitive psychology literature that anchoring was a quite important phenomenon (Traversky & Kahneman, 1974). In addition, experimental questions were added to the HRS survey asking people to estimate the circumference of the world. These questions used unfolding brackets but varied the initial bracket entry point about the world's circumference. The effect of varying entry points on estimates of the world's circumference was substantial. Similarly, experimental modules on anchoring were added to the second wave of AHEAD which queried respondents about the value of their savings and monthly consumption. Respondents were randomly assigned to different entry points and once again the impact of these anchors was substantial (Hurd et al., 1998).

The pervasiveness of anchoring and its relative magnitude, especially when respondents are uncertain about the correct answer, led the HRS designers to take this issue of anchoring more seriously. Starting with the 1998 wave of the survey, all respondents who did not give exact responses to questions about the value of their assets were randomly assigned to different set of initial entry points on the unfolding bracket questions. In spite of the different entry points, the distribution of categories in which the bracketed answers would lie were the same for all groups. These data were analyzed by Hurd, Kapteyn, and Zissimoulos (2001) who demonstrate that the effects of the initial entry point are significant. For example, consider those who were initial refusals to questions about the value of their stock holdings. Thirty-one percent of these respondents gave bracketed responses of less than \$25,000 when the initial entry point was \$2,500, compared to 16 percent when the initial entry point was \$125,000. Hurd, Kapteyn, and Zissimoulos also provide evidence that the impact of anchoring appears to be greater among those assets (stocks) for which there is greater respondent uncertainty about the value of the asset. The fact that the entry points are random is important. This randomization allows researchers to estimate the impact of the entry bracket on asset values and in principle to retrieve the true distribution of asset values.

Oversamples of Wealthy Households

Another reason for skepticism about the reliability of wealth data in household surveys was that mean wealth numbers from these surveys were often well below those available from external sources. These external sources such as the Federal Reserve Flow of Funds accounts were thought to have good measures of total household wealth, but these estimates from household surveys were typically three-quarters or less than those obtained from the external totals. One possible reason for this large disparity is that most household surveys do not include the extremely wealthy in their sampling frames. An implication of the extreme skewness in the wealth distribution is that estimates of mean wealth may be quite sensitive to the inclusion of households in the upper tail of the wealth distribution.

This issue was examined recently by Juster, Smith, and Stafford (1999). These authors compared the full distributions of household wealth in the Panel Study of Income Dynamics (PSID) and the Survey of Consumer Finances (SCF). Both surveys are representative of households across the full age distribution. The key sampling difference between the two surveys is that the SCF includes an oversample of wealthy households obtained through a link with IRS tax records.

The two wealth distributions were essentially identical up until the 30th percentile, after which they began to depart.² Figure 5.1 shows the nature

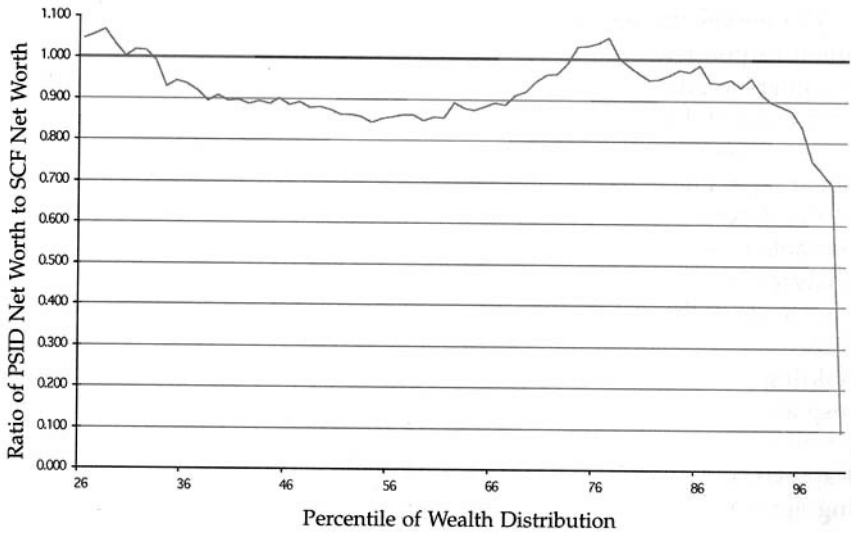


FIGURE 5.1 Total Net Worth (PSID/SCF)

of the departure by plotting the ratio of PSID/ SCF net worth for each percentile of the wealth distribution starting at the 26th. From roughly the 30th to 95th percentile, the different estimates of household wealth are relatively minor, in the order of 10% or less. After the 97th percentile, the two wealth distributions start to separate, but it is actually not until between the 99th and 100th percentile that the departure becomes pronounced. For example, the richest one percent of PSID households have less than one-tenth the wealth of the richest one percent of SCF households. These dramatic differences at the top of the wealth distribution are clearly the consequence of SCF sampling from tax files to capture the extreme upper end of the wealth distribution. Even though this segment represents only one in every 100 households, the consequences for estimates of mean wealth can be dramatic given the extreme skew to wealth distribution.

The higher and more accurate estimate of mean wealth obtained from the SCF due to their over-sampling of high-wealth households does not imply that data obtained from other household surveys are not extremely useful. The very wealthy remain a very difficult population to sample and SCF response rates in this sub-sample are often extremely low. For example, in the 1983 SCF, only 9% of the over-sampled wealthy households agreed to participate in the survey. Compared to the SCF, other household surveys such as the AHEAD ask many more questions on other aspects of the household's circumstances besides their household wealth. If one wants to explain why people have different amounts of wealth, we may

be better off with a 90 percent accurate estimate of wealth for 99% of the population with the compensating gain of having data on many of the potential explanatory factors that might matter.

Comprehensiveness of Measurement—Wealth

Another key issue that arises in measuring household wealth concerns how comprehensive the wealth concept should be. Since housing wealth is the most important asset for many households, would it be sufficient to have a measure of this component of wealth only? If one attempts to add questions about financial assets, what financial assets should be included? Can business equity be measured accurately in a household survey? What about the wealth that generates annuity incomes during retirement? The answers to these questions depend in part on how important the asset is within the overall portfolio and how difficult it would be to obtain such information in the context of a household survey.

Table 5.2 lists AHEAD estimates of mean asset value in each of 10 categories. These categories are also aggregated into sub-totals for tangible assets and financial assets. For these older households, housing remains in most cases the central asset. Mean housing equity is \$67,264—42% of total household wealth. While housing is the key asset, limiting wealth measurement to only include housing equity would be a serious error, as on average more than half of the assets of the household would be missed. Tangible assets (cars, businesses, and real estate) comprise about one-fourth of total wealth while the sum of all financial assets constitute more than one-third of mean total household wealth. An additional reason for measuring these financial assets in household surveys is that these more

TABLE 5.2. Components of Wealth

Housing Equity		67,464
Real Assets		36,559
Transportation	6,640	
Business and Farm	6,806	
Other Real Estate	23,113	
Financial Assets		58,093
Stocks	18,173	
Bonds	4,100	
Checking, Savings	17,287	
IRAs, Keoghs	8,287	
CDs	8,407	
Other Assets—Debts	1,839	
Total		162,116

Source: Calculations by author from baseline AHEAD survey.

liquid financial assets may be a better index of the resources a household has on hand to meet emergencies.

A related limitation in many household surveys is that they typically do not measure a large form of wealth to many households—the annuities that are received during retirement. The two most important such annuities in the American system are Social Security and private pensions. Social Security is an almost universal public sector retirement annuity in which the benefit is tied by a progressive formula to past earnings. Occupational pensions typically also are related to salary, but they are far from universal and are much more common in the larger private firms. For example, 53% of respondents who were in their fifties in the Health and Retirement Study (HRS) report that they are covered by a pension. These future annuity income flows, when discounted back to the present, constitute a large source of wealth for many households.

Instead of directly measuring wealth in the form of Social Security or pensions, the approach recent household surveys have taken is to ascertain instead current or future annuity income flows. These flows can then be discounted to obtain a present value of wealth in the form of pensions and Social Security. When households are already receiving these annuity incomes, measurement is more straightforward; the issues that arise are discussed in the next section on measuring income. Since these annuities are typically adjusted annually only for a cost of living adjustment (COLA), we need only know whether such COLAs will be applied and their normal amount in order to compute future annuity flows.

Matters are far more complicated for households who have not yet begun to receive these annuity incomes. Two possibilities exist. The first is to directly ask households whether, when, and how much income they expect to receive in the future. The difficulty with this approach is that many households do not know such information so that the extent of missing values on household surveys tends to be quite large (Smith, 1995). The second approach is to attempt to obtain pension information from the firm by asking respondents for permission to do so (see the chapter by Johnson, Sambamoorthi and Crystal in this volume for an example and discussion of this approach). Similarly, one could link to Social Security administrative records (once again after getting permission from the respondents) to retrieve Social Security income benefits. One potential difficulty with such links with firm or administrative records is that not all respondents will give their permission. In practice, permission forms have been signed in about 75% of the cases. The firm data can tell us at least the basic parameters of the pension systems in place; the link with Social Security records provides in most cases an exact computation of future benefits (given the current circumstances of respondents).

However one attempts to measure these forms of wealth, how important are they in terms of total household wealth? An answer is available from the HRS, which made a determined effort to measure both Social Security and pension wealth in addition to household wealth.³ Table 5.3 lists wealth-income ratios for the major sub-components of wealth across schooling groups. The "all" column in this Table 5.3 lists the ratio of this form of wealth to total household income. For example, on average in this sample, mean financial assets are 1.47 times household income while mean total household assets are 4.84 times household income. This table also illustrates the consequences of ignoring retirement annuities. Social Security and pension wealth are both about twice as large as total household income, so that combined Social Security and pension wealth are almost as large as the total household assets. Excluding these forms of wealth, especially for households in their immediate pre- or post retirement years, would lead to a significant understatement of the wealth available to households.

Table 5.3 also documents some stark contrasts in these components in their relative importance across education groups. By far, financial assets are the least important among the least-educated households; relative to their respective household incomes, financial assets are 3.3 times larger among college graduates compared to those who did not graduate from high school. Pensions are also regressive in their distribution, reflecting the greater prevalence of occupation pensions among highly educated workers. In contrast, Social Security is quite progressive with Social Security wealth income ratios three times larger among high school dropouts than among college graduates. The final row in Table 5.3 combines all forms of household wealth. This row nicely illustrates the reason why household surveys should attempt to have as comprehensive a measure of wealth as possible. Compared to household wealth alone, total wealth is relatively uniformly distributed across schooling

TABLE 5.3. Wealth/Income Ratios by Components of Wealth (HRS-Wave 1)

Type of Assets	Education of Head				
	ALL	No High School Diploma	High School Diploma	Some College	College
Financial Assets	1.47	0.63	1.15	1.46	2.07
Household Assets	4.84	3.69	4.18	5.00	5.74
Social Security	2.12	3.28	2.65	1.96	1.33
Pensions	1.85	1.25	1.74	1.69	2.26
Total Wealth	8.81	8.22	8.57	8.65	9.33

Source: Calculations by author.

groups. If one examined only financial wealth or even all household assets, wealth relative to household income would appear to rise sharply across education groups. However, this wealth/income gradient by schooling level is almost completely eliminated when the most comprehensive wealth measure is used.

Wealth Dynamics

To this point, I have discussed new methods of improving household wealth measurement that can be implemented completely in cross-sectional surveys. However, many of the recent new household surveys including AHEAD are panels with repeated observations on the same household over time. What do such panels tell us about the quality of wealth measurement and can these panels be used to further improve measurement?

One troublesome pattern obtained from these panels involves the large number of unusual transitions that occur between survey waves. A particularly puzzling pattern concerns respondents who reported having an asset in the prior wave who subsequently report that they are non-owners. For example, 55% of HRS respondents who gave exact dollar values for their bonds in the first wave of HRS reported that they did not have any bonds in wave 2. This transition has its mirror image in the large fraction of cases where respondents said that they did not own an asset in wave 1, but now own it in wave 2.

One possible explanation for the frequent transitions from asset ownership to non-ownership is that respondents actually engaged in extensive buying and selling of assets between the waves of the surveys. Since these surveys also recorded the extent of buying and selling of assets between the waves, this possibility can be checked. In the vast majority of cases in which there was a between wave transition for non-ownership to ownership of an asset, respondents also said that they did not purchase this asset. Similarly, in most cases in which a respondent changed from being an owner of an asset to a non-owner, there was no indication of any selling activity.

This mysterious appearance and disappearance of assets between waves of a panel survey suggests that there remains considerable measurement error in household assets. There are many plausible reasons why these errors emerge; interviewer keypunching mistakes (e.g., how many zeros are punched), unrecorded transfers of assets into and out of the household, asset relabeling, and respondent memory lapses. Given the size of this measurement error and the fact that the analytical interest of researchers often rests in the between wave changes, it must eventually be dealt with in any empirical research.

Modern survey technology does offer some possible solutions to these problems. For example, one solution may lie in extensive pre-loading of

prior wave wealth data. With pre-loaded data on CAPI or CATI surveys, interviewers may be able to detect on the spot major puzzling between-wave changes in asset amounts and then ask respondents about the source of the mystery. Initial attempts to employ such technology were used by HRS staff following the HRS 2000 interviews (Hill, 2002). In 2001, a sub-sample of HRS respondents who had large and unexplained changes in their asset values between the 1998 and 2000 waves were called back and were asked if they were able to reconcile the anomaly. Of the cases in which reconciliation took place, 48% of the original answers were found to be erroneous (Hill, 2002). Moreover, the size of the changes in value that were produced by this call back was not trivial. Across all assets in which reconciliation took place, the mean difference in asset value between the 1998 and 2000 wave was reduced by half—from about \$73,000 to \$36,000. More importantly, according to Hill (2002), the standard deviation of the difference in value between these two waves was reduced by over one million dollars. The latter number attests to the potential power of these call-backs in reducing measurement error in asset values.

Based on the success of this call-back experiment, HRS staff plan to automate this reconciliation as part of their normal interviewing procedures. In each wave, respondents will first be asked about their asset values in the normal fashion (without receiving any information about their previous asset values). If the value of their assets are inexplicably different from prior wave values by a pre-determined large amount, respondents will then be asked 'on the fly' a computer generated series of questions aimed at attempting to reconcile the large difference in their asset values across survey waves. This technology, which is clearly only at its beginning stage, may well be a powerful tool in further improvements in wealth measurement in household surveys.

MEASUREMENT OF INCOME

Questions about income rank among the most difficult to answer in household surveys. First, respondents may be reluctant to reveal this information if they think it is private and sensitive. These may also be cognitively among the difficult questions as people are being asked to remember income from many different sources and periodicities and perhaps for many different people in the household. Because of these difficulties, income is often not reported at all, under-reported, or misreported. For example, in the Current Population Surveys only about 90% of household income is reported. This problem is even more severe for certain types of income, some of which are quite prevalent among older households. Income from dividends and interest appears to be

understated by a factor of two, and only 70% of incomes from pensions and annuities are reported.

Unfolding brackets, which were discussed in the previous section, have also been used with considerable success in reducing item non-response for questions about household income and its components. Two additional recent innovations have been aimed particularly at improving income measurement, especially among the elderly. These innovations are integrating the questions on income and wealth, which may help respondents give more accurate answers concerning income received from capital and changes in the periodicity over which income flows are measured. This change in periodicity potentially provides a closer match between what the survey respondent knows best and the periodicity contained in survey measurement. These innovations have been introduced into both the HRS and AHEAD and were evaluated in a recent paper by Hurd, Juster, and Smith (2001).

Integrating Income and Wealth Modules

One of the most problematic components of income to measure is that which is received as a return on financial assets. This income is often episodic and may also be blended into financial statements so that the actual income flow is neither apparent nor memorable. Consequently, it is not surprising that this income from financial assets is widely regarded as among the most seriously under-reported income components.

A promising new method of helping respondents to answer questions about this income source is to integrate the questions on assets with questions on the income received from such assets. In most social science surveys that attempt to measure such income, either no asset questions are asked or the questions on assets are in a different module than the questions on income. The rationale behind the integration of questions about income and assets is that respondents will be better able to remember their income from assets if they had just been asked about the existence and amount of these assets.

The nature of the problem can be most readily seen in the inconsistencies that emerge when the income and asset questions are not integrated. Comparisons of the percent of people holding assets and the fraction who report receiving income from that asset best illustrate the problem. In a typical survey, the fraction who report asset income is well below the fraction who own the asset and should be reporting some income. The "asset" and "income from asset" questions were not integrated in the first two waves of HRS and the baseline wave of AHEAD. In both surveys, the fraction of households reporting interest or dividend income is much smaller than the percentage reporting ownership of assets that might yield an interest or dividend income flow. To illustrate, 75% of HRS wave 2 house-

holds report holding some financial assets, but less than 30% report having any interest or dividend income. But the most dramatic results occur among those with a great deal of these assets. Thirty-one percent of HRS 2 households who had more than \$250,000 of financial assets still reported that they received no income at all from these assets. That result is not plausible and indicates that without tying the income questions to the presence and amount of the asset there is a substantial understatement of the prevalence and level of income from assets.

In light of this gross inconsistency in income and asset reports, the way such income questions were asked was revised in the third wave of HRS and the second wave of AHEAD. Essentially, a "merged" asset and income module was created in which questions about particular types of assets were followed immediately by questions about income from that asset. This merger took place for questions on income from financial assets, income from real estate holdings, and income from farms or businesses. In each case, income questions followed immediately after asking respondents whether they held such assets and the total value of these assets.

Comparisons of results from this new way of asking about income from assets (used in HRS 3 and AHEAD 2) with estimates of income from assets produced by the conventional survey methodology (as reflected by HRS 2 and AHEAD 1) show dramatic differences in the income amounts reported. Between HRS 2 and HRS 3, income from these financial assets, real estate investments, and business and farm equity combined increased from \$5,669 a year to \$9,266 a year (see Hurd, Juster, & Smith 2001). Some of this increase in income may be due to the growing asset values prevalent in the 1990s, but this can explain only a small part of the increase. While the value of assets goes up by about 14% between HRS 2 and 3, income from assets increased by 63%. While the integration of asset and income questions affected all income sources, the impact was largest in income amounts from the four financial assets (a greater than two-fold increase), and smallest in income from business and farm (a 32 percent increase). Following the integration of the asset and income questions, capital income increases of an even larger magnitude (over \$8,000 compared to about \$3,500) appear between AHEAD 1 and 2. The integration of the asset and income question also resulted in a substantial decrease in the inconsistency between asset and income reports mentioned above. In HRS 3 among those with more than \$250,000 in these financial assets, only 3% did not report any income from this source.

Periodicity of Income

The second survey innovation concerns the time span or periodicity over which income is reported. For simplicity, many surveys have respondents

report all income sources in the same periodicity even though periodicity and regularity of payments may vary a great deal by income source. Yet, especially for income sources that are not variable, respondents may know and answer best if the question refers to the time interval in which they normally and most recently receive that income. When respondents are requested to report in a periodicity different than that of usual receipt, they are being asked to perform quickly some difficult cognitive and computation tasks. The value of a specific periodicity may be highest for income flows that tend to continue indefinitely, to change slowly (perhaps due to a COLA adjustment), and to arrive with uniform periodicity (typically a month).

Thus, the most likely income flows to gain from alternative periodicities may be income sources generally received by older and retired households. The most common source in this category is Social Security benefits, which are received monthly, are adjusted annually for Cost of Living changes, do not have taxes withheld, and involve withholding only to the extent that respondents select Medicare Part B as an option (more than 90% do). In this case, asking the amount of last month's Social Security check may produce better estimates of Social Security income than asking for Social Security benefits paid during the most recent calendar year. It may be better to estimate Social Security benefits by asking about last month's Social Security check, and multiplying it by twelve for respondents who began to receive Social Security payments prior to the beginning of the most recent calendar year (or multiplying it by the appropriate number of months for households who began to receive payments sometime during the prior calendar year).

Since—at least for sub-populations of recipients—the 'truth' is known, Social Security may also represent the ideal income source to gauge respondents' ability to report their income accurately. By age 70 when there are no earnings tests or Social Security disability income, Social Security income is fixed legislatively by a formula that depends on the history of past earnings and on family composition. If there are no changes in family composition due to divorce, separation, or death, Social Security income is only revised across calendar years by a universal Cost of Living Adjustment (COLA) first given in the January check each year.

Hurd, Juster, and Smith (2001) examined between-wave changes in Social Security income in a sample of AHEAD respondents for which only COLA adjustments should have taken place. After the prior wave Social Security incomes were adjusted for possible COLAs, if all respondent reports were completely accurate, these adjusted reports of Social Security income would be identical. Differences between them therefore reflect reporting error.

Hurd, Juster, and Smith (2001) compared differences in these reports under two reporting scenarios. The first corresponded to the conventional

method of measurement whereby respondents were asked their Social Security income on an annual basis. The second reflected the new method of measurement where respondents were asked their Social Security income last month which was then expressed as a yearly figure. The difference between these two methods was quite dramatic. Using the monthly income reporting periodicity, 80% of the differences in Social Security income reported between the waves of AHEAD were between plus or minus \$800 a year. For 90% of respondents, these income reports were no more than \$1,500 apart. In contrast, when the more conventional annual income periodicity was used, 80% of respondents had successive wave Social Security income reports that were plus or minus \$1900 a year—more than twice that than obtained when monthly periodicities were used—and 90% had reports that differed by more than \$3,500 a year. The use of a monthly periodicity that corresponds more closely to how respondents received their Social Security income apparently reduced measurement error in income by more than half.

Asking respondents to answer using a time interval consistent with how income is received apparently improves the quality of reports about income. This is certainly the case with Social Security, where the same amount is received many times in a regular periodicity. The same rationale may hold for many major sources of income. For example, pension payments are much like Social Security payments—once they start, they continue until the death of the recipient.

Comprehensiveness of Measurement—Income

Just as with wealth, one can raise a question about how comprehensive the measure of household income should be and whether or not it is necessary to attempt to gather information about the most salient components of income. Many surveys, especially those whose main interest lies in health outcomes, utilization, and costs, are satisfied to simply ascertain total household income. That is a serious mistake for two reasons. First, combining all income into one question results in both a significant bias (typically under-reporting) and misreporting (or random measurement error). Second, knowing the components of income is critical if different income components have different impacts on the outcomes of interest.

The 1993 Medicare Current Beneficiary Survey (MCBS) is a good example of the first type of problem. The MCBS is a very high-quality health survey with detailed information on health outcomes and expenditures. Unfortunately, MCBS income data are not nearly as complete, as the survey asks only a single question about total income for the respondent and spouse, if married. MCBS misses income from other people, such as children, who may be living in the household and who can help pay some

health care expenses. In addition, asking only a single question about total income typically leads to a lower estimate of the total than what one would obtain by asking and then summing the major income components. For example, Goldman and Smith (2001) estimate that MCBS understates family income by about 20% (due to using a single total question) and household income by 41% (due also to ignoring other family members).

The second problem with using a single total income question is that the impact of income may well depend on its composition. Table 5.4, adapted from Smith and Kington (1997), represents a good illustration of this type of problem. The outcome in the ordered model summarized in this table is self-reported general health status, where the categories are excellent, very good, good, fair, or poor. The relation of interest centers on the impact of income on general health status. In the first column, total income is entered linearly and a statistically significant positive coefficient is obtained. The positive effect of income on health is usually interpreted as meaning that more income is protective of health. In the next column, income is separated into three distinct components—a work-related component (weekly wages), a retirement income component, and all government assistance income. In this specification, the latter two income effects actually have the opposite sign (negative) so that additional retirement or government assistance income is associated with worse health. The reason of course is that poor health makes it more likely that one retired from the labor force and/or received government assistance. The third column in Table 5.4 adds a set of dummy variables as indicators of the receipt of wage, retirement, or government assistance income. In this specification, even the weekly wage variable is statistically insignificant and there are no remaining positive effects of income on health. Thus while a total income variable strongly suggests a very positive association of income on this health outcome, this effect disappeared when one was able to disaggregate income into its components.

TABLE 5.4. Ordered Probit Models of Self-Reported Health Status in HRS

Total income ^a	.0034	(11.3)			
Weekly Wages			.0467	(4.39)	.0061 (0.66)
Retirement Income			-.0050	(3.42)	.0108 (0.40)
Welfare Income			-.0355	(5.34)	-.0184 (1.96)
Weekly Wages = 0					-.3663 (13.5)
Retirement Income = 0					.2915 (8.01)
Welfare Income = 0					.0756 (1.51)

^aModels include controls for race, Hispanic, sex, age, marital status, and years of schooling (0–11, 12–15, 16 or more) of respondent and spouse. See Smith and Kington (1997). Coefficients are in thousands of dollars.

CONCLUSION

This paper summarized and evaluated a number of recent and important innovations developed to measure wealth and income in household surveys. The principal innovations for household wealth included the use of unfolding brackets, the randomization of entry points in the unfolding brackets to reduce the effects of anchoring, the comprehensiveness of wealth concept, and the use of prior and current information in panel surveys to detect and remove measurement error. Similarly, the key innovations for measurement of income included the integration of questions on assets and the income from such assets, matching the periodicity of income questions to the way in which such income is received, and asking questions on the key components that make up household income.

Combined, these innovations have led to a significant improvement in the quality of measures of wealth and income available in household surveys. For example, the use of unfolding brackets has led to a large reduction in item non-response to wealth and income questions as well as to a more accurate measure of both. Anchoring is a real problem when unfolding brackets are used, but randomization of the initial entry points is a viable remedy for this problem. In panel surveys, the data can be improved considerably if inquiries are made on the fly about puzzling answers across waves, asking respondents to explain and to possibly reconcile. With no extra survey time to administer, the integration of questions of income and wealth leads to improved measures of both. Respondents also benefit from being asked questions on income that correspond to the normal way in which they receive such income.

These gains in measurement of economic resources among the elderly have significantly altered our views about the economic status of the elderly. For both household income and household wealth, improved measurement has produced much higher estimates of average income and wealth to the elderly. Since many of the types of income and wealth sources that are most understated are more likely to be held by better-off older households, improved measurement has also produced higher levels of inequality among older households (see also Crystal & Shea 1990).

These gains in our ability to measure income and wealth should be viewed as a first step. The process of finding new and better methods of obtaining more accurate measures has by now a momentum of its own. In this field, innovation is very much in vogue, and new techniques, especially in longitudinal data settings, will certainly be forthcoming. Unfortunately, the prominent health surveys such as NHIS and NHANES have lagged in implementing the changes in economic measurement that have already taken place. In part, this reflects the relative importance that such surveys attach to measurement on the health side. But if such surveys want

to have a featured role in the ongoing debate on the relationship between Social-economic status (SES) and health, improvements in measurement of a variety of aspects of SES cannot be ignored.

NOTES

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1. The two other important social science surveys with high quality wealth modules are the Panel Study of Income Dynamics and the Survey of Consumer Finances. Neither survey has sufficient number of cases with respondents above age 65 to adequately describe that population.
2. If anything, in the bottom 30% of the distribution PSID net worth slightly exceeds SCF, in part we suspect because SCF does a better job at measuring all items of debt.
3. The numbers reported here were derived from respondents' reports of their future expected Social Security and pension annuities. See Smith (1995a) for the details of this calculation.

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CHAPTER 6

Gender Differences in Pension Wealth and Their Impact On Late-Life Inequality

RICHARD W. JOHNSON
THE URBAN INSTITUTE

USHA SAMBAMOORTHY
DIVISION ON AGING, INSTITUTE FOR HEALTH, HEALTH CARE POLICY, AND
AGING RESEARCH, RUTGERS UNIVERSITY

STEPHEN CRYSTAL
DIVISION ON AGING, INSTITUTE FOR HEALTH, HEALTH CARE POLICY, AND
AGING RESEARCH, RUTGERS UNIVERSITY

Employer-sponsored pension benefits are an important source of retirement income. In 2000, median private pension income was \$6,555 among elderly households with pension income, accounting for 27% of their household income (Social Security Administration, 2002). Pensions have also been growing in importance over time. For example, 41% of elderly households received income from employer sponsored pensions in 2000, compared with only 31% in 1976 (Social Security Administration, 1979, 2002). But benefits are unequally distributed across the population. Almost half of full-time wage and salary workers in the private sector lack pension coverage on their current jobs (U.S. Department of Labor et al., 1994). Workers with coverage tend to be economically advantaged in many ways. For example, covered workers are generally well educated, work for large firms, and earn high wages. Accumulated pension wealth—defined as the present value of the future stream of pension benefits—was more unequally distributed than overall household wealth among persons aged 51 to 61 in 1992 (Gustman et al., 1999). This finding is especially notable because most financial assets are concentrated among a relatively few wealthy households. In part because of the unequal dis-

tribution of pension benefits, income inequality within cohorts increases as they enter old age, despite the redistributive features that have been built into the Social Security system (Crystal & Shea, 1990; Crystal & Waehrer, 1996).

Differences in pension wealth may be especially large between men and women, given the gender gap in earnings and experience, both of which are important determinants of pension income. Limited access to pension income can erode retirement security for women. This is especially critical for unmarried women, who cannot rely on their husbands for retirement income. However, having pension income in one's own name is also important for married women, because it can provide protection against the loss of retirement income in the event of widowhood or divorce. Many married men make provisions for their wives in the event of their death by taking their pensions in the form of joint and survivor annuities—which continue until the death of both spouses—rather than as single life annuities, which cease as soon as the retired worker dies. Nonetheless, many women lose substantial pension income when they become widowed. Large differences in pension wealth between men and women may also exacerbate the well-known gender inequality in wages (Blau, 1998). Pension wealth often represents a significant portion of total compensation, and the gender gap in pensions could offset at least part of the wage gains that women have achieved in recent years.

This chapter compares employer pension income for retired men and women and pension wealth for employed men and women approaching retirement. Among older adults with pension income in 2000, women received only 54% as much private pension and annuity income as men. Among full-time wage and salary workers aged 51 to 61 in 1992 with pension coverage, median pension wealth on the current job was 76% greater for men than women. However, differences in the wage, years of job tenure, and industry between men and women accounted for most of the gender gap in pension wealth on the current job. Less than one-third of the wealth difference could not be explained by gender differences in job characteristics, education, or demographics. The less-advantaged employment situation of working women currently in midlife carries over into worse retirement income prospects. However, the gender gap in pensions is likely to narrow in the future as married women's employment experiences increasingly resemble men's.

THE STRUCTURE OF PENSION PLANS

The way in which workers accumulate pension wealth depends on the type of plan their employer provides. In traditional defined benefit (DB)

plans, retirement benefits are set by plan formulas. Some DB plans provide retirees with a fixed dollar amount for every year of service, but in most plans benefits are set equal to a specified percentage of earnings for each year of service. The percentage factor itself sometimes increases with years of service. Plan documents specify the earnings base used to compute benefits. Most plans use average earnings received in the last few years before retirement, such as the final five years, but some plans base benefits on average earnings received throughout the career. Workers can begin to collect benefits once they reach the plan's normal retirement age, and they can sometimes collect reduced benefits at earlier ages. Some plans provide cost-of-living adjustments after retirement, but these provisions are much more common in the public sector than the private.

Workers with DB plans generally accumulate little pension wealth until late in their careers, when pension wealth grows rapidly. Benefits for workers in salary-based plans who leave at young ages are computed on earnings received many years before retirement. These earnings are generally much lower than earnings received later in the career, because inflation, productivity growth, and seniority increase wages over time. Low wages, in combination with limited years of service, translate into limited DB pension wealth for workers who leave the firm early on. And most plans include five-year vesting requirements, so that workers who quit before completing five years with the employer forfeit all of their accumulated benefits. However, for those who remain with the employer until the plan's early or normal retirement age, pension wealth often grows dramatically. Each additional year of service increases the share of earnings that go into the pension benefit, and associated wage growth increases the earnings base on which benefits are computed.

Until recently, most workers with pension coverage participated in DB plans. Now, after several years of strong growth, defined contribution (DC) plans predominate. Among workers in the private sector in 1999, about 21% had a DB plan, 27% had a DC plan, and 9% had both a DB and DC plan (Bureau of Labor Statistics, 2001). In DC plans, employers and employees typically contribute to individual tax-deferred saving accounts, which are used to finance retirement. Some plans require workers to contribute, while employers match these contributions up to a specified amount. In other plans, employer contributions are not related to worker contributions; instead they are set equal to a proportion of salary or they increase with years of service. At retirement, workers receive the balance in their account, which they can take as a lump sum or (sometimes) as an annuity.

Total contributions to DC plans generally increase with earnings and years of service. High-wage workers can afford to defer more salary until retirement than those with low wages. As a result, even when employers do not tie their contributions to the worker's salary, employer contribu-

tions will increase with earnings if employers match the workers' contributions. And even if plan contributions remain constant each year, the total amount contributed to the plan will increase over time. Of course, the account balance at retirement depends not only on the level of contributions to the plan, but also on the returns they earn. Nonetheless, as long as returns are not negative, account balances generally increase with earnings and years of service.

Some employers offer hybrid pensions that combine features of DB and DC plans. Cash balance plans, the leading type of hybrid plan, have grown rapidly in recent years. According to a recent General Accounting Office survey, 19% of Fortune 1000 firms sponsored cash balance plans in 1999, and more than half of them were established within the previous five years (General Accounting Office, 2000). Cash balance plans are similar to DC plans in that employers regularly set aside a given percentage of salary for each employee. In addition, benefits are expressed as an account balance, but these balances are only bookkeeping devices. Benefits are paid from commingled funds invested in a pension trust on behalf of all participants. Upon retirement, workers can receive their benefits as a lump sum or as an annuity. Like DC plans, cash balance plans are more portable than typical DB plans for workers who leave their jobs prior to retirement. Unlike DC plans, employers credit interest on their contributions at a pre-determined rate, protecting employees from market fluctuations. Because cash balance plans are technically DB plans, they are federally insured by the Pension Benefit Guaranty Corporation.

Since benefits increase with earnings and years of service in virtually all employer-sponsored pensions, regardless of plan type, and men receive higher wages and work more years than women, men tend to accumulate more pension wealth than women. Although the gender gap in earnings has shrunk considerably over the past generation, it is still substantial. Among full-time wage and salary workers aged 25 and older, women earned only 62% as much as men in 1979 (Bureau of Labor Statistics, 2001). In 2000, women earned 74% as much as men.¹ Working women also have higher turnover rates than men, leading to fewer years of seniority (Royalty, 1998). These factors can combine to generate substantial gender differences in pension wealth among covered workers.

Women may also be sorted into jobs that offer low pension benefits. Defined benefit plans often impose financial penalties for leaving employment before retirement, because benefits are generally based on a nominal measure of final earnings, which erodes in value with inflation. Firms may backload compensation in this way until the end of the career as a means of reducing turnover and the hiring and training costs associated with it (Allen, Clark, & McDermid, 1993; Gustman & Steinmeier, 1993; Johnson, 1996).² Firms may also offer pensions as a means of eliciting effort

from workers when monitoring performance is difficult, since workers who are caught shirking and fired would forfeit the generous pension benefits they would have otherwise earned near the end of the career (Lazear, 1979). Women, however, may avoid jobs that backload compensation with defined benefit plans if they anticipate that child-rearing responsibilities will lead to intermittent work histories. Similarly, firms may avoid hiring women for jobs with substantial specific training requirements, which often offer generous pension plans (Johnson, 1996), because women tend to have higher turnover rates than men.³

GENDER DIFFERENCES IN PENSION INCOME

Gender differences in the receipt of employer pension income among older adults remain high, although the gap has narrowed over time. Table 1 reports the percentage of men and women aged 65 and older receiving employer pension income (of all types), by year and marital status. In 2000, 43% of elderly men received employer pension income, compared with only 28% of women. The gap was even larger among married adults: 45% of older married men, but only 20% of older married women, received employer pension income in 2000. The share of elderly women receiving pension income increased more than 50% over the past twenty-five years and even increased during the 1990s, when the percentage of older men with pension income had stagnated. However, aged women remain only about 65% as likely as aged men to receive pension income.

Older women with pensions also receive much less pension income on average than men. In 2000, for example, women with pension income averaged \$4,164 in private pension and annuities benefits, compared with \$7,768 for men, as reported in Table 6.2. The gender gap in private pension income

Table 6.1. Percentage of Men and Women Aged 65 and Older Receiving Employer-Pension Income, by Year and Marital Status

	1976	1986	2000
Men			
All	37	47	43
Married	39	49	45
Not Married	32	39	37
Women			
All	18	23	28
Married	11	16	20
Not Married	22	28	34

Source: Social Security Administration (1979, 1988, 2002).

has actually worsened over the past twenty-five years. In real terms, median pension income remained virtually flat among female recipients from 1976 to 2000, whereas median pension income increased about 25% for men.

Despite the low levels of pension income received by women who are currently retired, an examination of pension wealth for current workers may present a more optimistic picture of the economic well-being of female retirees in the near future. Because retirement income depends on benefits that accrue throughout one's working life, information on current workers can provide important insights into the level and distribution of expected retirement income for future cohorts of elderly persons. Rapid changes in the labor market experiences of women over the past twenty-five years suggest that patterns of pension wealth may differ for women approaching retirement as compared with women who have already reached later life.

PENSION COVERAGE ON THE CURRENT JOB

Differentials in rates of pension coverage between men and women have contributed to the large gender gap in pension income after retirement. However, gender differences in pension coverage have been declining steadily since the early 1970s. (See Figure 6.1.) In 1972, only 38% of women employed full-time in the private sector as wage and salary workers had pension coverage on the current job, compared with 54% of men. Over the next three decades pension coverage increased steadily for women but declined somewhat for men. As a result, pension coverage rates on the current job are now almost identical for men and women who work full time. In 1999, 51% of men and 49% of women who worked full-time in private sector wage and salary jobs participated in pension plans.

TABLE 6.2. Median Private Pension and Annuity Income (in \$2000) Received by Men and Women, by Year and Marital Status (Among Pension Recipients)

	1976	1986	2000
Men			
All	\$6,234	\$5,970	\$7,768
Married	6,507	6,332	8,200
Not Married	5,538	4,556	7,042
Women			
All	4,055	3,048	4,164
Married	3,965	2,985	3,869
Not Married	4,086	3,079	4,311

Source: Social Security Administration (1979, 1988, 2002).

Note: Values were converted to constant \$2000 by the change in the Consumer Price Index.

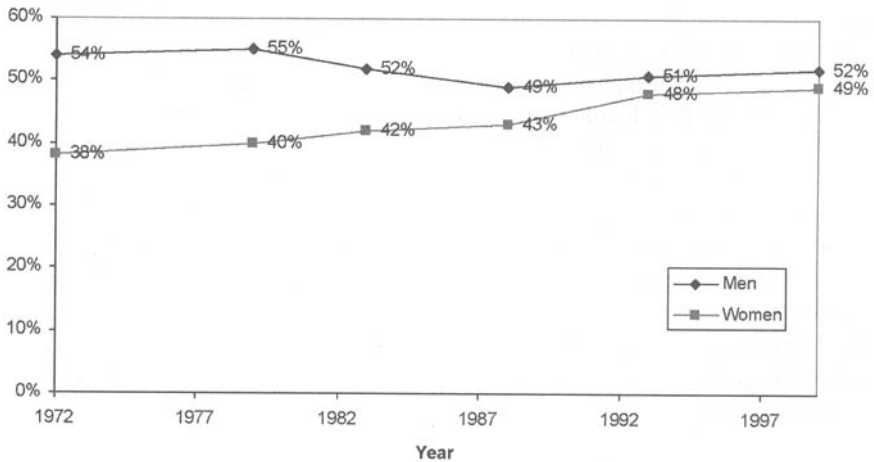


FIGURE 6.1. Pension Coverage Rates Among Full-Time Private-Sector Wage and Salary Workers, by Year

Source: U.S. Department of Labor et al. (1994, Undated) and Woods (1989).

Data from the Health and Retirement Study (HRS) provide insight into some of the underlying causes of gender differences in pension coverage. The HRS is a nationally-representative survey of men and women ages 51 to 61 in 1992. Conducted by the University of Michigan for the National Institute on Aging, it provides an especially rich source of information on pension coverage and pension wealth for a large sample of Americans nearing retirement. It is especially important to examine coverage near retirement because pension wealth in defined benefit plans generally increases sharply in the years immediately prior to the plan's retirement age. Consequently, in terms of future pension income pension coverage at midlife is more important than coverage earlier in the lifecycle.

Among full-time wage and salary workers ages 51 to 61, 68% of women and 75% of men participated in pensions on the current job in 1992. (See Table 6.3.) Considering men and women together, 30% of workers were covered by a single DB plan on the current job, 22% were covered by a single DC plan, and 20% had combination coverage, defined as having more than one plan from the current job (generally a combination of DB and DC plans). The entire gender gap in pension coverage arose from differences in combination coverage. Only 16% of women had combination coverage on the current job, compared with 24% of men.

Wages are an important determinant of pension coverage. The probability of pension coverage on the current job increases with the worker's wage. For example, pension coverage among full-time workers earning \$6

or less per hour was only 26%, compared to 90% for full-time workers earning more than \$15 per hour. (See Table 6.4.) At every wage level, women were at least as likely as men to participate in pension plans. To a large extent, the gender gap in pension coverage (which is fairly small to begin with) results from the preponderance of women in low-paying jobs, not differential treatment of women and men with similar job characteristics. For example, only 17% of women in the sample working full time were earning more than \$15 per hour, compared with 47% of men. Additional evidence from the HRS suggests that about two-thirds of the gender gap in pension gap in pension coverage is attributable to gender differences in wages earned on the current job (Johnson, Sambamoorthi, & Crystal 1999).

ESTIMATING PENSION WEALTH

Participation in pension plans would not necessarily protect the economic well-being of women in retirement if the benefits they eventually received were small. Thus it is important to compare the expected stream of future pension benefits for men and women with pension coverage. By examining accumulated pension wealth for current workers, instead of pension

Table 6.3. Pension Coverage on the Current Job Among Full-Time Wage and Salary Workers, Ages 51–61, 1992

	Men	Women	Total
Any Type of Plan	75.2%	68.4%	72.2%
DB Plan only	30.0%	30.6%	30.2%
DC Plan only	21.4%	22.2%	21.8%
Combination coverage	23.8%	15.6%	20.2%

Source: Authors' computation from the 1992 wave of the Health and Retirement Study.

Table 6.4. Wages and Pension Coverage on the Current Job Among Full-time Wage and Salary Workers, Ages 51–61, 1992

	Distribution of Wages			Pension Coverage		
	Men	Women	Total	Men	Women	Total
Hourly Wage						
\$6 and under	6.8%	14.9%	10.4%	20.8%	28.9%	25.9%
\$6.01 – \$10	19.2	38.5	27.7	55.8	62.7	60.0
\$10.01 – \$15	27.5	29.2	28.2	77.4	83.4	80.1
More than \$15	46.5	17.4	33.7	89.8	89.5	89.7

Source: Authors' computation from the 1992 wave of the Health and Retirement Study.

income for retirees, it is possible to relate expected future benefits to the characteristics of the job on which they were earned, in order to better understand the determinants of pension income. Also, in light of the rapid changes in the labor force behavior of women over the past few decades, pension income received by elderly women today would not necessarily be a reliable indicator of the level and distribution of benefits that future cohorts of elderly women are likely to receive.

Estimates of pension wealth are difficult to generate. Although surveys sometimes ask respondents about the level of pension income they expect to receive upon retirement, most workers are not well informed about their future retirement benefits (Mitchell 1988), and estimates of pension wealth based on self-reports are generally unreliable (Johnson, Sambamoorthi, & Crystal 2000) particularly for defined-benefit plans. A better approach to estimating pension wealth for such plans is to collect information from pension providers, who can supply the details of the complex formulas that determine the level of benefits in DB plans (as well as level of contributions made to DC plans). In the HRS, summary plan descriptions from pension plan administrators, which included information about retirement ages, vesting requirements, employee and employer contributions to the plan, cost of living adjustments, Social Security offsets, and the formulas on which benefits are based, were matched with information about respondents (including wages and years of service) to generate estimates of pension wealth.

Detailed pension information was collected for 3,834 HRS respondents, or about two-thirds of those who reported pension coverage in 1992. An important limitation of the provider data is that HRS respondents who were successfully linked with summary plan descriptions do not represent a random sample of respondents with pension coverage. Although match rates did not differ substantially by gender, with 68% of covered male workers and 67% of covered female workers linked to provider data, the proportion of covered workers with provider data varied substantially by plan type, firm size, industry, wage, and education. For example, only about 30% of respondents who participated only in defined contribution plans and worked in firms with fewer than 100 employees were successfully matched with summary plan descriptions, compared to about 77% of respondents who participated only in defined benefit plans and worked in firms with 500 or more employees. Match rates were also quite high among workers in public administration and the professional services industry and among well-educated and high wage workers. For example, 95% of covered men and 92% of covered women working in public administration were linked to summary plan descriptions provided by their employers. Within subgroups, however, gender differences in match rates were generally insignificant.

We accounted for the over-representation of particular subgroups of covered workers in the pension provider sample by reweighting the provider data so that the distribution of full-time workers by firm size and plan type was consistent with the observed distribution among full-time workers with pension coverage in the full HRS sample. The weights were computed as the ratio of the proportion of observations in the full HRS sample with a given plan type and firm size to the proportion of observations in the pension provider sample with the same pension plan and firm size. In both samples, the frequency computations were restricted to full-time wage and salary workers with pension coverage on the current job. The largest sample weights were assigned to respondents in firms with fewer than 100 employees and in defined contribution plans, who were assigned weights of 2.15. The smallest weights, equal to 0.74, were assigned to workers in firms with 500 or more employees and those in defined benefit plans. In the weighted provider sample, the distribution of workers by key characteristics, such as gender, education, race, plan type, firm size, industry, occupation, job tenure, and wage, was similar to the distribution of workers who self-reported pension coverage in the first wave of the HRS.

We restricted our sample to full time wage and salary workers participating in pension plans on the current job. Part-time workers in their fifties may have already retired from their career jobs, on which they earned the bulk of their pension wealth. We also eliminated self-employed workers because the determinants of compensation may be quite different for them than for wage and salary workers. Members of the Armed Forces were dropped because we were concerned only with the civilian labor market. Our final sample consisted of 1,230 men and 902 women.

GENDER DIFFERENCES IN PENSION WEALTH

Gender differences in pension wealth on the current job among covered full-time wage and salary workers at midlife are much larger than the observed differences in pension coverage. Median pension wealth on the current job for covered men ages 51 to 61 in 1992 was \$120,193, compared to only \$68,118 for covered women, representing a 76% advantage for men.¹ (See Table 6.5.) Pension wealth was substantially higher for men than women among all demographic and educational groups. For both men and women, pension wealth increased with education, years of job tenure, firm size, and the hourly wage. Among men, whites had accumulated 43% more pension wealth by midlife than nonwhites. Although substantial, the racial gap in pension wealth was significantly smaller than the gender gap in pension wealth. Among women, nonwhites had

TABLE 6.5. Worker Characteristics and Estimated Pension Wealth on the Current Job for Covered Workers, By Gender

	Percent Distribution of Worker Characteristics		Median Value of Pension Wealth	
	Men	Women	Men	Women
All	100.0	100.0	\$120,193 ^w	\$68,118
Plan Type				
Defined benefit	43.9	43.6	105,159 ^w	80,987
Defined contribution	29.5	31.6	85,559 ^w	31,655
Combination	26.6	24.9	200,984 ^w	94,474
Marital Status				
Currently married	86.2	65.8	123,551 ^w	69,640
Widowed, divorced, separated	9.2	27.3	118,788 ^w	66,406
Never married	4.7	6.9	88,589	68,118
Race				
White	89.1	84.4	125,776 ^w	65,118
Non-white	11.0	15.6	88,096	81,132
Education				
Did not attend high school	5.7	2.7	51,678 ^w	18,748
Less than 4 years of high school	10.0	10.5	59,247 ^w	38,608
High school graduate	34.5	36.0	111,949 ^w	44,248
Less than 4 years of college	19.7	20.9	119,227 ^w	78,777
College graduate	30.1	29.9	185,256 ^w	124,461
Years of job tenure				
One or less	3.6	5.2	31,765	16,868
1.01 - 5	10.2	15.1	42,221 ^w	20,916
5.01 - 10	13.4	19.3	53,493 ^w	36,305
10.01 - 15	10.5	17.0	84,876	78,777
15.01 - 20	11.0	17.2	135,270 ^w	84,192
More than 20	51.4	26.4	200,817 ^w	151,290
Hourly Wage				
\$6 and under	2.0	6.2	16,826	17,691
\$6.01 - \$10	12.9	34.1	37,554	33,783
\$10.01 - \$15	28.4	38.0	85,415	86,698
Over \$15	56.6	21.7	193,980	159,332
Number of Observations	1,230.0	902	1,230	902

Note: The sample was restricted to full-time wage and salary workers aged 51 to 61 who were covered by a pension on the current job. Members of the Armed Forces were excluded. Tabulations were weighted to account for the oversampling of blacks, Hispanics, and Florida residents in the HRS sample and the underrepresentation of workers in small firms and defined contribution plans in the provider supplement. The superscript w denotes statistically significant gender differences in median pension wealth at the 5% level. Chi-square tests indicated that worker characteristics differ significantly at the 5% level for all categories, except for plan type, education, and firm size.

Source: Authors' computations from the pension provider supplement of the 1992 Health and Retirement Study.

higher pension wealth at midlife than whites, reflecting the stronger attachment to the labor force among nonwhite women than white women in this cohort.

Gender differences in pension wealth may arise because men and women possess different personal and job characteristics or because a given set of characteristics leads to different levels of pension wealth for women than for men. Models that relate pension wealth to worker characteristics (education, race, marital status) and job characteristics (years of job tenure, industry, occupation, union membership, firm size, and hourly wage) can be estimated to decompose the gender gap into the portion due to gender differences in characteristics and the portion due to differences in returns to those characteristics (Oaxaca, 1973). The portion of the gender gap in pension wealth that is due to differences in characteristics is said to be the "explained" portion, because that part of the gender gap might be eliminated if men and women had identical observable characteristics. The portion that is due to differences in returns is more problematic, because it suggests that men and women with identical observable characteristics are treated differently, perhaps due to labor market discrimination or to gender differences in tastes for deferred compensation.

The explained portion of the total gap in pension wealth can be computed in two different ways. It can be estimated as the sum of gender differences in characteristics, weighted by the male returns to those characteristics. Alternatively, gender differences in characteristics can be weighted by the female returns. The two approaches can give different results, depending upon how the distribution of returns varies by gender. Since neither approach is necessarily better than the other, the true portion of the gender gap that can be explained by differences in observable characteristics between men and women is generally thought to lie somewhere between the estimates derived from the two different approaches.

Table 6.6 reports the regression results that were used to decompose the gender gap in pension wealth, and Table 6.7 presents the results of the decompositions. The entries in Table 6.7 indicate the percentage of the total gender gap in pension wealth that results from gender differences in a given characteristic, holding other characteristics constant. To indicate the full range of estimates, the explained portion of the gender gap is reported when differences in characteristics are weighted by female returns and when they are weighted by male returns. As presented in the table, somewhere between 36% and 39% of the gender gap would be eliminated if work experience with the current employer were equalized for men and women, all else constant. If men and women earned identical wages, the gender gap would be reduced by at least 18% and as much as 61%, depending on how the gender gap is decomposed. Equalizing other characteristics would have very small effects on gender differences in pension

TABLE 6.6. Estimated Marginal Effects on Pension Wealth on the Current Job for Covered Workers, By Gender

	Men	Women
Education		
Did not attend high school	-0.024	-0.220
Less than 4 years of high school	-0.222	-0.279
High school graduate	-0.124	-0.305†
Less than 4 years of college	-0.296*	-0.004
[Reference: College graduate]	—	—
Race		
[Reference: White]	—	—
Non-white	-0.232*	-0.143
Marital Status		
[Reference: Currently married]	—	—
Widowed, divorced, or separated	0.031	0.090
Never married	0.011	0.104
Years of Job Tenure		
One or less	-0.885**	-0.875**
1.01 – 5.0	-0.780**	-0.855**
5.01 – 10.0	-0.615**	-0.640**
10.01 – 15.0	-0.509**	-0.483**
15.01 – 20.0	-0.292*	-0.289*
[Reference: More than 20]	—	—
Union		
Yes	-0.187†	0.184
[Reference: No]	—	—
Firm Size (no. of employees)		
Under 100	-0.315*	-0.418**
100 – 499	0.107	-0.346**
[Reference: 500 and over]	—	—
Hourly Wage		
\$6 and under	-0.921**	-0.593**
\$6.01 – \$10	-0.639**	-0.262†
\$10.01 – \$15	-0.528**	-0.120
[Reference: Over \$15]	—	—
Adjusted R ²	0.23	0.24
Number of Observations	1,230	902

Note: The marginal effects are estimated from linear regressions of the natural log of pension wealth. The regression also includes an intercept term and industry and occupation controls. Asterisks and daggers indicate the statistical significance of estimated effects, relative to the omitted reference category (** = $p < .01$, * = $.01 < p < .05$, † = $.05 < p < .10$, ‡ = $.10 < p < .15$). The sample was restricted to full-time wage and salary workers aged 51 to 61 who report pension coverage on the current job. Members of the Armed Forces were excluded.

Source: Authors' computations from the pension provider supplement of the 1992 Health and Retirement Study.

TABLE 6.7. Decomposition of Gender Differences in Pension Wealth on the Current Job for Covered Workers

	Male Coefficients	Female Coefficients
All	111	70
Education	1	-1
Race		4
Marital status	-1	-4
Years of Job Tenure	36	39
Industry and Occupation	17	3
Occupation	-13	5
Union	-3	3
Firm Size	0	3
Wage	70	20

Note: Table entries indicate the percentage of the gender difference in pension wealth that can be explained by each factor. The sample was restricted to full-time wage and salary workers aged 51 to 61 who were covered by a pension on the current job. Members of the Armed Forces were excluded.

Source: Authors' computations from the pension provider supplement of the 1992 Health and Retirement Study

wealth. (For certain variables, such as marital status, eliminating the gender difference would slightly increase the gender gap in pension wealth, because the actual distribution favors pension wealth for women.) If all characteristics in the model were identical for men and women, the decomposition based on female returns predicts that two-thirds of the gender gap in pension wealth would be eliminated, while the decomposition based on male returns predicts that the *entire* gender gap would disappear. Thus, the results of the model suggest that differential returns in the labor market to human capital and other variables between men and women are not the primary cause of gender differences in pension wealth. Rather, it is predominantly differences in personal and job characteristics between men and women that lead to relatively low pension wealth for women. In particular, the low wages earned by women working full time at midlife and their relatively short job tenures appear to be primarily responsible for their poor retirement prospects.

Of course, this observation does not mean that there is no problem, or indeed that factors such as discrimination are not in operation—it simply shifts the nature of the problem. While the wage gap has narrowed somewhat, it remains a source of late-life inequality for the next cohort of elderly. And, particularly in the context of the existing U.S. retirement income system, shorter job tenures for women continue to be a threat to their future late-life economic well-being. Thus, policies that influence female job tenure

and wages, like work policies towards family leave and reliance on informal sources of long-term care, ultimately can have important influences on late-life gender inequities in economic status (cf. McGovern, Dowd, Gjerdengen, & Moscovice, 2000; Flippen & Tienda, 2000).

PROSPECTS FOR PENSION WEALTH OF FUTURE COHORTS OF WOMEN

The overall economic status of the elderly has improved markedly over the past few decades. Between 1976 and 2000, real median income increased 32% for elderly households (SSA 1979, 2002), while rising only 10% for all households during the same period. Poverty rates are now lower among the elderly than among the general population. However, despite the overall improvement in the economic well-being of the aged, elderly women continue to receive much less income than elderly men. In 2000, for example, median income for unmarried elderly women was only 77% as large as for unmarried elderly men (SSA 2002). Much of the income gap can be attributed to gender differences in pension benefits. Increasing the level of pension benefits received directly by women and reducing the gender gap in pension wealth is an important public-policy issue; improvements in this area could provide valuable economic security to vulnerable elderly women.

The fair and equitable treatment of women in the labor market is another important policy goal. Although most studies of gender inequality in the workplace focus on male-female differences in wages, pension wealth often represents a substantial portion of total compensation. Large gender differences in pension wealth could offset at least part of the large gains in wages that women have achieved in recent years.

For women who are currently retired or approaching retirement age, pension wealth is quite low. Among the elderly, women are only about two-thirds as likely as men to receive income from employer pensions, and women with private pension income receive benefits that are only 54% as large as men's, on average. Moreover, among full-time workers at midlife, accumulated pension wealth is also only 57% as large for women as for men, although the probability of pension coverage among full-time workers is only slightly lower for women than for men. Moreover, differences in monthly pension income between men and women who are about to retire are probably larger than these estimates of the gender gap in pension wealth. Because life expectancy is greater for women than for men, a given level of pension wealth translates into lower monthly benefits for women than for men.⁵ In addition, among middle-aged persons not working full time, men are more likely than women to be receiving pension

income, so by focusing on full-time workers we are understating the difference that exists in the entire population of middle-aged Americans.⁶

Nonetheless, the research described here suggests that pension income will improve substantially for women who begin to retire over the next few decades. Evidence from the HRS indicates that most of the gender gap in pension wealth among full-time wage and salary workers at midlife arises from differences in job characteristics between men and women. Labor market discrimination against women, gender differences in tastes for pension income, and other unobservable factors affecting pension income appear to account for only a small part of the gender difference in pension wealth. The dramatic reduction over the past thirty years in gender differences in employment characteristics suggests that the gap in pension wealth between men and women are likely to narrow over the coming years. Women's labor force participation, years of work experience, and earnings have all been increasing, both in absolute terms and relative to men, since members of the Baby Boom cohort began reaching adulthood in 1970. From 1970 to 1995, labor force participation rates increased 26% for women ages 35 to 44 while declining 6% for men at the same ages. During the same period, real weekly wages among full-time workers ages 35 to 44 increased 20% for women and fell 13% for men (Blau, 1998). Although young women are still less likely to work than men and continue to earn less than men when they do work, the likely result of these trends will be greater pension wealth for women, leading to more equitable labor outcomes for working women and improved economic security for elderly women.

Private and government employee pensions are just one source of retirement income. Economic security in later life also depends upon Social Security benefits, savings, and earnings. The available evidence suggests that many of these other sources of retirement income are increasing for women as well. For example, through midlife members of the leading edge of the Baby Boom cohort, who will begin to reach age 65 after 2010, had received more income and had accumulated more assets than their parents had at the same stage of the lifecycle, suggesting that retirement prospects have improved over time for both men and women (Crystal and Johnson 1998; Easterlin, Schaeffer, & Macunovich, 1993; Sabelhaus & Manchester, 1995).⁷ In addition, comparisons of the size and composition of assets held by married couples approaching retirement in 1992 with the assets held by couples in 1969 indicates that wives today would retain a substantially greater share of their consumption in marriage if they were to become widowed. The improvement in the economic security of wives appears to come primarily from increases in private pension wealth, conventional assets, and women's earnings (Weir & Willis, 1999).

For women, the problem of limited pension wealth has largely been a problem of low earnings. The narrowing in the gender gap in wages,

coupled with increases in job experience for women, is the strongest indication that pension wealth for women will probably increase in coming decades. However, the continued existence of the same gender gap in wages, which has persisted for decades, might lead some observers to argue that gender differences in pension wealth are likely to continue for many years to come. Research indicates that about 10% of the gender gap in wages remains unexplained after controlling for differences in observable characteristics between men and women and may result from discrimination against women in the labor market (Blau & Kahn, 1997). Although the models reported here suggest that discriminatory behavior may not directly affect women's pension wealth in a substantial way, it may play an important indirect role by reducing the wages earned by women.

In the past, women's pension wealth has been limited by a number of factors. In virtually all pension plans, benefits are based on past earnings and time spent on the job. In traditional DB plans, pension income is generally computed as a specified fraction of some measure of final earnings times years of job tenure. In DC plans, where future benefits are determined by the amount of funds that have accumulated in the worker's individual account, account balances typically increase over time and plan contributions from both employers and employees generally increase with wages. In both types of plans, then, men's traditional advantages in wages and years of job experience led to higher pension wealth for men than for women.

Women may also have been sorted into jobs that offer low pension benefits. DB plans often impose financial penalties for leaving employment before retirement, because benefits are generally based on a nominal measure of final earnings, which erodes in value with inflation. Firms may backload compensation in this way until the end of the career as a means of reducing turnover and the hiring and training costs associated with it. Firms may also offer pensions as a means of eliciting effort from workers when monitoring performance is difficult, since workers who are caught shirking and fired would forfeit the generous pension benefits they would have otherwise earned near the end of the career. Women, however, may have avoided jobs that backload compensation with DB plans if they anticipated that child-rearing responsibilities would interrupt their employment. Similarly, firms may have avoided hiring women for jobs with substantial specific training requirements, which often offer generous pension plans, because turnover rates have historically been higher for women than men. Federal pension funding regulations may also have discouraged firms with DB pension plans from hiring older women returning to the labor market after raising families. Since the required contributions that employers must make to their pension funds increase with the age of the participant, DB plans increase the cost of hiring older workers.

As women's employment histories and earnings increasingly resemble men's, the factors that have contributed to women's low pension wealth are becoming less prevalent, suggesting that women's pension income is likely to rise substantially over the next quarter century. However, the improvement in pension income will not solve all of the economic problems confronting elderly women. In particular, eliminating the gender gap in pension wealth is unlikely to reduce the high rates of poverty among elderly widows. In 2000, for example, 18% of unmarried elderly women were impoverished, compared with only 10% of all elderly persons (Social Security Administration, 2002). Most poor elderly widows have limited education and little labor market experience, even relative to other women in their cohort, and were usually married to men who lacked pension benefits (Burkhauser, Holden, & Feaster, 1988). Efforts to protect these women should focus on their low skills and lifetime of low income, not their gender.

In upcoming decades, the gender gap in pension wealth may not be a critical concern for women nearing retirement. Instead, the principal challenge for women preparing for retirement in the near future may be the increasing popularity of DC plans, which are supplanting DB plans as the most common type of retirement benefit. Increasing numbers of both men and women are subject to the risks inherent in DC plans, in which future benefits are not guaranteed and instead depend upon the market returns earned by plan contributions. A special concern is that as they become responsible for investing their own pension funds, many workers, especially women, are pursuing overly conservative investment strategies that could over the long-term lead to relatively low retirement benefits, even though they reduce risk of losses in the shorter term. (Bajtelsmit & VanDerhei, 1997; Goodfellow & Schieber, 1997; Hinz, McCarthy, & Turner, 1997).

NOTES

1. However, the gender gap in earnings has increased somewhat in the past two years, after falling continuously since 1979. In 1998, women earned 76% as much as men, among full-time wage and salary workers aged 25 and older (Bureau of Labor Statistics, 2001).
2. Gustman and Steinmeier (1993) found that the workers in defined contribution plans were no more likely to quit their jobs than workers in defined benefits plans. Since defined contribution plans do not generally backload compensation, their finding suggests that the low turnover rates exhibited by workers with pensions are driven not by potential capital losses but by the compensation premia earned by covered workers.
3. An important advantage of pensions for most workers is that they offer tax-advantaged opportunities to save for retirement, since contributions to the plan

and interest they earn are not taxed until pension benefits are received. Even and Macpherson (1994) argue that women will benefit less from the tax advantages of pensions because they earn less than men, and thus will be less likely to choose jobs which offer generous pensions. However, since most married couples file joint tax returns, the tax savings offered by pension plans should be equally advantageous to most married men and married women.

4. These pension wealth estimates assume that all workers remain with their current employers until age 65, at which time they begin to collect benefits. For workers in DB plans, estimated wealth was based on the assumption that benefits were received as single-life annuities. The value of the annuity was estimated using separate life tables for men and women. The annual inflation rate was assumed to equal 4.0%, the real interest rate was assumed to equal 2.3%, and wages were assumed to grow at a real annual rate of 1.0%. These assumptions correspond to the intermediate projections of the rates of interest, inflation, and wage growth used by the Social Security Administration in 1996 to assess the financial condition of the OASDI trust fund.

5. For workers with DB plans, pension wealth was estimated by taking the present discounted value of the stream of monthly benefits, under the assumption that all beneficiaries opted for single life annuities, which pay benefits until the death of the beneficiary. The present value of this stream of benefits was adjusted for survival probabilities, using gender-specific life tables. Since women are expected to live longer than men, a given monthly benefit will translate into higher pension wealth for women than for men. Conversely, a given level of DB pension wealth implies lower monthly benefits for women than for men. For workers in DC plans, pension wealth was computed as the present value of the estimated account balance at age 65. Except for workers who receive their DC benefits in the form of annuities from their employers, which by law must be computed using sex-neutral lifetables, a given account balance also translates into lower monthly benefits for women than for men because women tend to live longer.

6. In the 1992 HRS, 19% of male respondents ages 51 to 61 who were not working full time received pension income, compared to only 7% of women not working full time.

7. For an opposing view of the retirement prospects of the Baby Boomers, see Bernheim (1993).

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CHAPTER 7

Human Capital and the Long-Term Effects of Education on Late-Life Inequality

GEORGE FARKAS

DEPARTMENT OF SOCIOLOGY AND POPULATION RESEARCH INSTITUTE
THE PENNSYLVANIA STATE UNIVERSITY

Birth, schooling, employment, retirement, death. Twelve to 16 or so years of schooling, 40 or so years of paid employment, 15 or so years of retirement. Such, with appropriate adjustments for birth cohort, gender, and social class background, is the expected life cycle for many in the United States today.

Within this pattern, education and training are central to the determination of later life outcomes. Across individuals, no variable better predicts lifetime earnings and mental and physical well-being than the number of years of schooling completed. Conceived by economists as *human capital investment* (Mincer, 1958, 1974; Schultz, 1960; Becker, 1964), the study of the determinants and consequences of variation in years of schooling and training completed has emerged as one of the dominant paradigms in social scientific research. Sociologists have joined in, adding *social capital* (resources available via social networks and group membership) and *cultural capital* (skills and habits available via family socialization and group culture) to the list of investment goods yielding a later life return (Coleman, 1988; Swidler, 1986; Portes, 1998, 2000; Farkas et al., 1990; Farkas, 1996, forthcoming; Lareau, 1987, 2000). In concert with the individual's genetic and wealth inheritance, achieved human, social, and cultural capital largely determine late-life inequality. In this paper I review what has been learned about the mechanisms by which this inequality occurs, and the relative magnitudes of each of the effects, with a particular focus on outcomes in late life.

HUMAN, SOCIAL, AND CULTURAL CAPITAL

The *human capital* investment paradigm (Becker, 1964; Mincer, 1958, 1974; Schultz, 1960, 1981) has proven particularly durable for the study of education and training as assets useful in production. Economists have recently expanded their discussion to include noncognitive skills and habits as well as cognitive skills, and the effects of intervention programs and schools on student values, habits, and behaviors as well as academic skills (Bowles, 1998; Bowles & Gintis, 2000; Bowles, Gintis, & Osborne, 2001; Cameron & Heckman, 1993; Heckman & Lochner, 2000; Heckman & Rubinstein, 2001; Duncan & Dunifon, 1998; Duncan, Dunifon, & Brooks-Gunn, 2001). Yet, even economists seem to realize that the notion of a carefully calibrated benefit/cost calculation regarding how much to invest in one's children's education does not explain why low income families are generally unable to assist their children to achieve school success.

This is better explained by the second research literature, concerned with *cultural capital*. Swidler (1986) conceives this approach as building on the work of Bourdieu (1977). She notes that he sees individuals as using strategies that build on their "habitus" (culturally shaped skills and habits) to organize their life (Swidler, 1986: 275 and f.n. 9). She says: "Culture . . . is more like a style or a set of skills and habits than a set of preferences or wants. If one asked a slum youth why he did not take steps to pursue a middle-class path to success . . . the answer might well be not 'I don't want that life,' but instead, 'Who, me?' One can hardly pursue success in a world where the accepted skills, styles, and informal know-how are unfamiliar. One does better to look for a line of action for which one already has the cultural equipment." In other words, low-income parents fail to assist their children to succeed at school not because they see too low a payoff to such action, but because they lack the skills, habits, and knowledge needed to do so. And lacking these skills and habits themselves, they are unable to assist their children to obtain them.

What are these skills and habits? They include the usual academic skills of language (including vocabulary and grammar), reading and mathematics, and the usual teacher-demanded work habits of homework, class participation, effort, organization, appearance and dress, and lack of disruptiveness (Bernstein, 1975; Heath, 1983; Farkas et al., 1990; Farkas, 1996, forthcoming; Ogbu, 1999). They may also include participation in "high culture" (DiMaggio, 1982), although parental assistance with more mundane skills, for example, reading, is more consequential for student success (De Graaf et al., 2000).¹ Of course, the parents' own cultural capital (school-related skills and habits) is central to the provision of such parental assistance (Lareau & Horvat, 1999; Lareau, 2000).

Finally, a third research tradition follows the cultural capital tradition by emphasizing the resources parents use to assist their children toward school success, but focusing on *social capital*—resources stemming from parental and neighborhood social networks (Coleman, 1988; Portes, 1998, 2000; Lin, 2001). Central to these is the concept of community closure—parents' relationships with other adults in the neighborhood. "Intact families double the supervisory and supportive capacity of parents, while closure expands these capacities further by involving other adults in the rearing and supervision of children" (Portes, 2000: 6).

These three perspectives contain a common core—the application of resources to child rearing. That is, to building skills and habits in children. These resources are primarily provided by the child's parents, but may also be provided by extended family members, neighborhood adults, and adults paid with public funds. However, assistance from the latter two groups must typically be gained by parental or family actions. Thus, all three theoretical perspectives—human, cultural, and social capital—combine to constitute what may be referred to as *family resource theory*. Children raised in families with high levels of human, cultural, and social capital resources tend to develop high levels of these resources themselves. It is variation in *these* resources that create the mechanisms leading to inequality in late-life outcomes.

MECHANISMS FOR THE EFFECTS OF HUMAN, SOCIAL, AND CULTURAL CAPITAL ON LATE-LIFE INEQUALITY

The most obvious mechanism of human capital's effect is that those who complete more schooling use it to attain occupational employment with better pay and working conditions than would otherwise be available to them. Since better-paying occupations typically also provide better fringe benefits, including health insurance and retirement benefits, as well as lower unemployment rates, the advantages of increased position within the occupational structure accumulate rapidly, leading to very substantial differences in full earnings (all compensation included) over the life-cycle (Crystal & Shea, 1990; Crystal, Shea, & Krishnaswami, 1992). Of course the magnitude and variation of these effects is largely determined by institutional arrangements within society generally, and firms' compensation packages particularly. We discuss this later in the paper.

This effect of schooling on earnings is central to the human capital paradigm—workers who go further in school are thereby investing in skills that increase their productivity, and their increased life-cycle earnings represent a fair market return on this investment. But the effects of school-

ing on late-life inequality potentially encompass more than the simple fact that increased years of schooling increase work productivity and, therefore, pay. Rather, greater education is also associated with increased social and cultural capital, and these affect not only pay, but also the individual's social psychological resources, health lifestyle, physical functioning, and perceived health and happiness.

Perhaps the key social psychological resource is the sense of personal control. This has been operationalized as internal locus of control (Rotter, 1966), mastery (Pearlin et al., 1981), instrumentalism (Wheaton, 1980), self-efficacy (Gecas, 1989), and personal autonomy (Seeman & Seeman, 1983). Individuals scoring high on this dimension believe that they can achieve their goals through their own efforts. By contrast, lack of control or powerlessness is the belief that one is relatively helpless against powerful external forces. Not surprisingly, the sense of personal control is correlated with other measures of well-being. It is positively associated with life-style behaviors that improve health. It avoids the suppression of the immune system that is associated with personal demoralization. It is positively related to the individual having a strong network of social support. And central to our discussion here, schooling attainment pushes all of these variables upward.

The effects of human, social, and cultural capital are intertwined as they increase schooling, employment, earnings, sense of personal control, health-related behaviors, and social support networks. Positive feedback loops are common. Over the life-cycle, the likely effect is that (as has been shown for early reading skill [Stanovich, 1986], and for progress through the educational system [Kerckhoff & Glennie, 1999], "the rich get richer," where wealth is measured not just monetarily, but also includes both physical and psychological health (and therefore, happiness). This notion of cumulative advantage, first proposed by Merton (1968), has now become a major paradigm in the study of aging (Crystal & Shea, 1990; O'Rand, 1995; Ross & Wu, 1996), one that has been explicitly linked to feedback loops in human, social, and cultural capital (O'Rand, 2001). The goal of the present paper is to synthesize and expand on this discussion.

The mechanisms underlying cumulative advantage are straightforward. During K-12 schooling, families with greater human, social, and cultural capital resources (two parents as opposed to one, higher parental education, occupation, and earnings, greater parenting focus and skill, better psychological and physical health, more extensive social networks, a more positive neighborhood environment) translate these advantages to their children by instilling skills and habits that assist the child to have positive engagement and success with school and peers. The efforts and activities these parents and their children engage in lead to the children's development of positive skills and habits, and the success of these efforts

leads to positive outcomes and a sense of personal control for the children. These in turn encourage further effort and optimism—high goals are set for the future because present goals have been met and the experience has been pleasant and rewarding.

Children who have been provided with these advantages are disproportionately likely to enroll in, and complete, college. Many go further, and receive training and a degree in business, law, medicine, engineering, education or other professional field. At each stage, human, social, and cultural capital are further augmented. Skills and habits of social interaction and productive work are learned and practiced. Network connections are expanded. The sense of personal control increases. New horizons become visible, and goals are adjusted upward. Completing more schooling affects these outcomes positively because the individual has a greater stock of productive skills. Positive effects may also flow from credentialing, and from the selectivity (prestige) of the schools attended (Ross & Mirowsky, 1999).

The process continues through the period of working life and the employment career. Better educated workers pursue careers in a national labor market. They choose spouses from a larger pool of individuals, with career experiences and personal strengths similar to their own. They are geographically mobile, and build social networks across multiple geographic locations. They travel more, both for business and pleasure, and adopt a cosmopolitan outlook. Once again, multiple feedback loops are in operation. Education increases earnings and economic security. The sense of personal control is strengthened. A healthful life-style is more likely to be adopted. (This includes a greater emphasis on exercise and the avoidance of obesity; and a lower likelihood of excessive drinking and smoking). Social support networks are denser and more extensive, as well as being more likely to overlap both professional and personal lives.

Higher levels of these economic, psychological, and social assets are characteristic of better educated workers near the close of their working lives, and on into retirement. Moreover, better-educated workers not only have higher levels of these assets, but they appear to use them more effectively (Mirowsky & Ross, 1999). The result is, on average, less economic hardship, a higher standard of living, less psychological distress, a greater sense of personal control, and greater happiness among the elderly who are better educated.

MAGNITUDES OF EFFECT

That, over the life-cycle, those rich in human, social, and cultural capital tend to get richer in these attributes, is not surprising. Nor is the observation that this process occurs via multiple causal mechanisms,

with positive feedback loops. But what are the relative magnitudes of these effects?

Ross and Wu (1995) showed that schooling improves health via its effect in decreasing unemployment, increasing full-time and subjectively rewarding work, increasing income, and decreasing economic hardship. Education also improves health by increasing the individual's sense of control over her or his life, increasing social support networks, leading to a more healthful lifestyle. Further, net of these indirect effects, education also exerts a direct positive effect on health.

One of the more detailed empirical studies of the many positive effects of education on work and economic, social psychological, and health lifestyle outcomes, was reported by Ross and Mirowsky (1999). Their results on mean differences in these outcomes across educational levels, based on a 1995 national survey of respondents, are shown in Table 7.1.

We see very large effects of schooling on full-time employment and on household income, with the full-time employment rate and household income of those with a college degree being more than twice the levels of high school dropouts. We also see a similarly dramatic effect of education on the individual's sense of control, with high school dropouts scoring .354 and college graduates scoring .845, well above twice this level! Relatively large educational effects are also found for health lifestyle, with the better educated group reporting much higher levels of exercise and much lower levels of smoking and heavy drinking. Overall, this table documents substantial differences in economic and health-related outcomes across educational groups.

But what about the differential effects of education as individuals age? Perhaps the most detailed empirical work on the magnitude of educational differences in health late in life has been reported by Ross and Wu (1996). The authors analyze two data sets. The first, the *Work, Family, and Well-Being* data, are based on a 1990 telephone survey of a national probability sample of U.S. households. The second, the *Health Practices* data, are based on a 1979 telephone survey of a national probability sample of U.S. households, re-interviewed in 1980.

In the *Work, Family, and Well-Being* data, physical functioning is measured by the following items: "How much difficulty do you have (1) going up and down stairs; (2) kneeling or stooping; (3) lifting or carrying objects less than 10 pounds, like a bag of groceries; (4) using your hands or fingers; (5) seeing even with glasses; (6) hearing; (7) walking?" Responses are coded 0 for a great deal of difficulty, 1 for some difficulty, and 2 for no difficulty. The overall measure for this variable is the average of the scores for the seven items. A similar scale is available in the *Health Practices* data.

TABLE 7.1. Mean Work and Economic Conditions, Social Psychological Resources, and Health Lifestyle at Three Levels of Education: Aging, Status and the Sense of Control Survey, 1995

	Less Than High School Diploma	High School Diploma to Some College	College Degree or More
Work and Economic Conditions			
Employed full-time ^a	.219 (.414)	.413 (.493)	.549 (.498)
Employed part-time ^a	.050 (.217)	.110 (.313)	.069 (.254)
Not employed ^a	.731 (.440)	.477 (.500)	.382 (.486)
Unable to work ^a	.084 (.277)	.033 (.179)	.088 (.087)
Household income (in \$1,000s per year) ^a	25.671 (25.818)	39.446 (46.845)	59.062 (52.458)
Economic hardship ^a	1.588 (.845)	1.420 (.646)	1.233 (.489)
Work fulfillment ^a	3.015 (.574)	3.114 (.588)	3.330 (.583)
Social Psychological Resources			
Sense of control ^a	.354 (.470)	.625 (.510)	.845 (.466)
Social Support ^a	3.142 (.454)	3.276 (.510)	3.399 (.524)
Health Lifestyle			
Walk ^b	3.225 (3.550)	3.507 (3.489)	3.742 (3.357)
Exercise ^a	2.300 (3.442)	3.265 (3.530)	3.565 (3.528)
Smoke ^a	.807 (.802)	.756 (.805)	.517 (.701)
Abstain from drinking ^a	.676 (.469)	.447 (.497)	.312 (.464)
Moderate drinking ^a	.311 (.463)	.537 (.499)	.665 (.472)
Heavy drinking	.008 (.088)	.014 (.118)	.020 (.139)
Overweight ^c	26.330 (5.175)	25.589 (4.552)	24.950 (4.429)

Notes: Numbers in parentheses are standard deviations. $N = 2,493$.

^aEducation categories are significantly different at $p < .001$ (two-tailed tests).

^bEducation categories are significantly different at $p < .10$ (two-tailed tests).

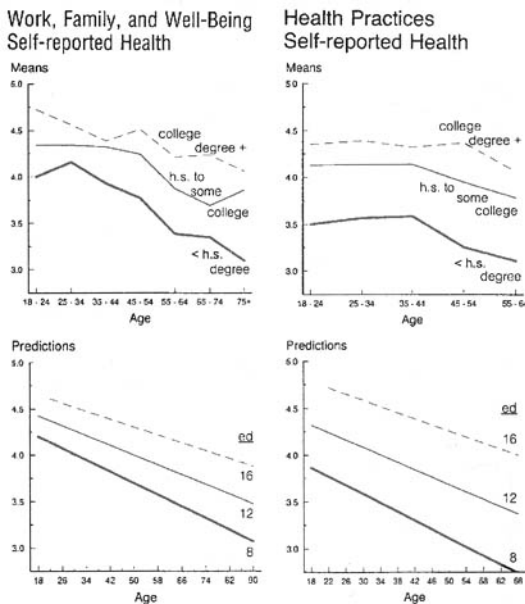
^cThe significant ($p < .001$) association: of education with overweight holds for women only, with the means at the three educational levels, from low to high respectively being 26.462, 25.109, and 23.865. For men, there is no significant association of education with overweight. The means at the three educational levels are 26.088, 26.294, and 26.194.

Self-reports of subjective health in the *Work, Family, and Well-Being* data are coded very poor (1), poor (2), satisfactory (3), good (4), or very good (5). Once again, a similar scale is available in the *Health Practices* data.

The authors run regressions to predict physical functioning and self-reported health. Key independent variables are age, education (years of schooling completed), and interactions between them. Control variables include gender, race, marital status, household income, and interactions between income and age.

The results for physical functioning from each of the data sets are shown in Figure 7.1 below. The top panel shows the unadjusted means of the dependent variable by education and age. The bottom panel shows the regression-estimated effect of age on physical functioning for each level of education, with the control variables set at their means.

We see that in both data sets, with and without regression adjustment, the results are similar. At every age, the higher the education, the higher the level of physical functioning. Also, at every educational level, physical functioning declines with age. When people are young, most function at a very high level, so that education-specific gaps are relatively small. However, with age, the decline in physical functioning is more rapid for the less-well educated, so that a significantly larger gap opens up between education groups. Particularly noteworthy here are the relatively sharp



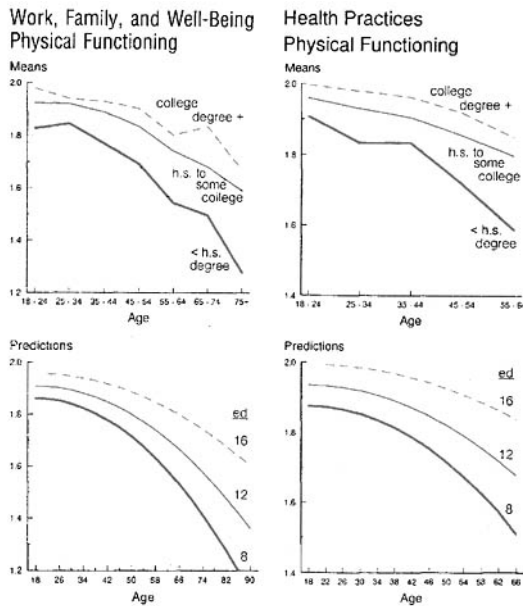
The top panels graph the unadjusted means. The bottom panels graph regression models from Equation 1 of Tables 1 and 2, setting at the mean level of control variables.

FIGURE 7.1. The Relationship Between Age and Physical Functioning at Three Levels of Education

declines in physical functioning for high school dropouts as they move past middle age. But declines that are almost as sharp are observed for those with at least a high school, but less than a college education. This is strong evidence for cumulative disadvantage in physical functioning as the less-well educated age. By comparison, college-educated individuals experience a much more gradual decline in physical functioning as they age.

Figure 7.2 repeats these analyses for self-reported health. The results are similar to those for physical functioning in that at all ages, the better-educated report better outcomes, and at all educational levels, health declines with age. However, one difference from the previous analysis is that in Figure 7.2, one needs to look at the regression-adjusted results to see the clear-cut nature of the downward slope with age. This is because increasing income with age somewhat ameliorates the decline in self-reported health with age, particularly for the best-educated.

Ross and Mirowsky (1999) followed-up this research by testing the relative magnitude of effect of three aspects of education—years of schooling completed, the credential of a college degree, and the selectivity of the college attended—on health, using data with an over-sampling of the elderly. They found that by far the largest effect was due to education com-



The top panels graph the unadjusted means. The bottom panels graph regression models from Equation 1 of Tables 1 and 2, solved at the mean level of control variables.

FIGURE 7.2. The Relationship Between Age and Self-reported Health at Three Levels of Education

pleted. Net of this, there was no credentialing effect of completing a college degree. Selectivity of college had an effect largely because it is associated with an improved health lifestyle. The authors also found that the principal reason education increased physical functioning and perceived health is that it increased work and economic conditions, social psychological resources, and health lifestyle.

O'Rand (2001) reviews evidence for the education-driven life-cycle pattern of either *cumulative advantage* or *cumulative hardship*, and finds it to be strongly supported. She notes that this is consistent with the work of Bandura (1995) on cumulative efficacy, of Clausen (1993) on competence, and of Elder et al. (1996) on the successful negotiation of stressful life events. She notes that Lynch et al. (1997) found a strong relationship between, on the one hand, childhood social class status, and on the other hand, adult social class status and health. These relationships are powerfully mediated by educational attainment, health lifestyle, and psychosocial characteristics such as depression, hostility, and hopelessness.

A related discussion is provided by Carr (this volume). Analyzing data from the Wisconsin longitudinal study, she reports that cumulative disadvantage for children from lower socioeconomic status households operates much as we have discussed above. Less-advantaged family beginnings lead, on average, to fewer years of schooling attained, and thus occupational employment with greater risk of unemployment, less-advantageous working conditions and lower life-cycle earnings, including lesser (or no) health insurance and retirement savings. The resulting less-advantageous mid-life occupational and earnings outcomes in turn lead to less advantageous late-life outcomes on economic and health dimensions (both physical and psychological).

Similar mechanisms underlie the disadvantaged economic and health outcomes experienced by older African-Americans compared to older whites (Smith & Kington, 1997a, b; Hayward & Heron, 1999). Particularly noteworthy here is the higher rate of hypertension among African Americans (Cooper & Rotimi, 1994), a pattern likely associated with discrimination and segregation in housing, schools, and employment. More generally, social class differences in life-cycle inequality are likely due at least partially to the geographic segregation of the poor, and their confinement to less hospitable environments (Hayward, Pienta, & McLaughlin, 1997).

THE ROLE OF INSTITUTIONAL ARRANGEMENTS

Thus far our description of life-cycle behavior and outcomes has focused primarily on individuals, their families, and their social networks. Yet this individual-level behavior and the pattern of outcomes for individuals are

crucially determined by the incentive and reward structures within which these individuals operate. This *social/economic structure* is partially embodied in the institutional arrangements of society in general, and of individual firms in particular.

Perhaps the most important institutional arrangements for issues of late-life well-being in the United States today are those concerned with the provision of economic support and health insurance for the elderly. And central to these arrangements is the current system of privately financed retirement and health insurance fringe benefits, provided by employers, largely to mid-to-upper level, and to unionized lower-level, employees.

Economists studying life-cycle earnings have concluded that in many cases, long-term employment with the same firm resembles an implicit contract, in which workers are paid less than their actual productivity when they are young, and more than their actual productivity when they are old (Lazear, 1979; Medoff & Abraham, 1980, 1981; for a review see England & Farkas, 1986: Chapter 6). A lower wage when workers are young helps compensate the firm for the cost of training, and provide an incentive for those workers with long time horizons and the greatest amount of firm-specific human capital to be loyal over the long-run. A central feature of this "back-loaded" compensation scheme is the provision of health and retirement fringe benefits that become most valuable later in life. When this is combined with monetary wages that rise faster than productivity in later life, we see strong patterns of cumulative advantage for the better-educated and most highly placed employees. Eventually, the total compensation received by these workers is so much in excess of their current value to the firm that mandatory retirement rules or very generous retirement "buyout packages" are necessary to induce them to retire (Lazear, 1979).

This employer-based system for the provision of health insurance and retirement benefits is a chief cause of sharply increasing inequality in later life. But it is not the only institutional arrangement that has had this effect. Others include the revolution in increased economic opportunity for women, and the (apparently associated) "divorce revolution" in which it has become much easier than heretofore to terminate marriages. One result has been greater diversity in household types among Americans of all ages. With continued strong patterns of assortative mating by educational level, particularly within the middle and upper classes, combined with decreased marriage and increased non-marital childbearing among the least well-educated, particularly inner-city African-Americans, total household incomes at the top and bottom of the social class hierarchy are diverging ever more widely. Thus increasing numbers of husband-wife

couples where both are well-paid professionals with generous retirement plans invested in the stock market may attain their first million dollars well before they reach retirement age. At the same time, increasing numbers of single mothers and their children are supported on minimum, or barely above minimum-wage jobs, providing no health insurance or retirement benefits at all.

Added to these patterns has been a sharp long-term decline in unionization among American workers, as employment shifts out of manufacturing, particularly "rust-belt" industries, and into the service sector. The resulting decline in "blue-collar elite" jobs in unionized manufacturing such as autos and steel has been exacerbated by globalization and foreign competition. Added to this has been the increased computerization of the economy. A consequence has been a strong increase in the wage premium paid to college graduates, and stagnant or declining real (adjusted for inflation) wages for less-skilled jobs (Bernhardt et al., 2001). These technological changes, and their effects on institutional arrangements, have also acted to increase life-cycle patterns of cumulative advantage and disadvantage in employment and household life.

CONCLUSION

Our review of the literature shows that education, in particular years of schooling attained, is *the* key stratifying variable determining later-life outcomes. Given the positive correlation between parents' years of schooling attained and that of their offspring, the process resembles cumulative advantage/disadvantage beginning at birth.

Where income and wealth are concerned, this process operates particularly strongly toward the high end of the occupational distribution, with individuals in high-paying occupations accumulating wealth quite rapidly as they age. With the run-up of the stock market during the 1990s, this effect was substantially magnified.

Where health is concerned, even high occupational standing, income, and wealth cannot prevent an eventual decline with age. However, the best educated individuals are able to put this decline off longer, and cause the slope of decline to be less steep, than is the case for the less-well educated. This appears to be at least as much due to the healthier lifestyle and greater psychological resources and sense of control, as to the greater income, of the better educated. Here, increased inequality with age is largely due to the very rapid decline in health experienced by less educated individuals as they grow older. This appears to result from a pattern of *cumulative disadvantage*, as the physical and psychological pressures

of a harder life, with fewer economic and psychological resources to fall back on, take their toll.

O'Rand (2001: 201–202) relates such cumulative disadvantage to the “disablement process” as discussed by Verbrugge and Jette (1994). She notes that as chronic and acute health conditions develop in mid-to-late life, the individual's ability to maintain a high level of functioning can depend critically on their level of human capital (access to health insurance and medical care), social capital (access to personal assistance and social support and integration), and what she refers to as *personal capital*, and we have referred to as *cultural capital* and its correlates (personal skills, habits, and behavioral repertoires, including self-confidence and locus of control). When attained schooling is low, and as a consequence, the individual's human, social, and cultural capital are limited, disablement proceeds much more rapidly with age. This accounts for the steeper slopes found for the less-well-educated groups in Figures 7.1 and 7.2.

In sum, as a result of the past twenty years of research in this area, we have come to a much better understanding than heretofore about stratification mechanisms operating over the life-cycle. Years of school attained is central to these mechanisms, since it is the chief determinant of occupational attainment and employment status over the life cycle, which is in turn the chief determinant of the individual's life-cycle earnings trajectory and accumulated wealth for retirement.

However, correlated with this human capital investment and return over the life cycle, are the attainment of social capital network ties and cultural capital skills and habits that strongly reinforce the earnings effects of attaining employment in a well-paying occupation. As individuals age, these social and cultural capital resources have both an economic and a non-economic benefit. The latter operates substantially through a strong sense of self-efficacy and the adoption and maintenance of a healthy life style, that, for the more highly educated, contribute quite strongly to maintaining relatively high levels of physical and psychological functioning well into old age. One of the more attractive research opportunities in this field concerns a more detailed specification of the causal mechanisms underlying these social and cultural capital effects as individuals age, and as successive cohorts with higher average education reach their retirement. Also important are the changing institutional arrangements of American employment and households, and the ways that successive birth cohorts are responding to these opportunities and constraints. As these changes develop, one thing remains clear—education continues to become ever more important to inequality at all life-cycle stages, particularly to the cumulative inequality observed in later life.

NOTES

1. Kingston (2001) makes a similar point, but then argues against my "expansive" use of the term *cultural capital* to include everyday skills and habits such as reading skill and good work habits, arguing instead that Bourdieu only intended the term to include high status cultural signals such as the beaux arts, and that we should respect his usage. I disagree, preferring instead to build on Swidler's (1986) understanding of Bourdieu's meaning. In this paper I review the work of a number of researchers who also include a broad range of skills and habits as objects of study (see, for example, Mirowsky & Ross, 1999; O'Rand, 2001).

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CHAPTER 8

Socioeconomic Background and Midlife Health in the United States

DEBORAH CARR, PH.D.

DEPARTMENT OF SOCIOLOGY AND INSTITUTE FOR HEALTH,
HEALTH CARE POLICY, AND AGING RESEARCH
RUTGERS UNIVERSITY

Social gerontologists often assert that the aging process starts at birth. This claim is a particularly appropriate starting point for understanding socioeconomic differentials in psychological and physical well-being at midlife and beyond. Childhood social and economic resources are an important influence on adult health and well-being, yet researchers disagree on the strength and inevitability of the relationship, as well as the precise causal mechanisms linking early experiences with later life health outcomes. The latency model underscores the potentially important *direct* impacts of childhood conditions on adult well-being, while the pathways model highlights the individual and cumulative adult life course experiences that link early conditions with health and well-being in adulthood (Goldman, 2001). In contrast, the resilience perspective focuses on identifying those factors that systematically weaken, or even reverse, the harmful long-term consequences of early economic adversity (e.g., Singer, Ryff, Carr, & Magee, 1998).

In this chapter, I present research and theory that explicates the linkages between childhood socioeconomic resources and three indicators of midlife health: self-rated health, hypertension, and depression. First, I review research that discusses the pathways through which childhood socioeconomic resources affect health and well-being in adulthood. I then present analyses, based on the Wisconsin Longitudinal Study (WLS), that evaluate the ways that early socioeconomic resources affect midlife health—both directly and indirectly, via adult social roles and statuses. Finally, I provide a brief overview of two recent lines of research that call into question the persistent and intransigent effects of socioeconomic background for midlife well-being, and that seek to identify those factors that

minimize the long-term effects of early disadvantage. Implications for policy and future research are discussed.

THE IMPORTANCE OF MIDLIFE AS A LIFE STAGE

Until very recently, social gerontologists and life-course sociologists focused their attentions largely on the health, wealth, and well-being of the elderly (i.e., persons age 65 and older), while demographers typically focused their research on the "demographically dense" years of young adulthood (e.g., Rindfuss, Swicegood, & Rosenfeld, 1987) or on late-life mortality (e.g., Preston, & Taubman, 1994). Middle age (generally defined as ages 45 to 64) has received far less attention, and has been described as "the last uncharted territory in human development" (Brim, 1992: 71). In the past five years, however, research on midlife has flourished, evidenced by the publication of several influential edited volumes (e.g., Lachman, 2001; Ryff, Kessler, & Brim, forthcoming; Willis & Reid, 1999) and the availability of large sample surveys of the midlife population, including the Wisconsin Longitudinal Study (Sewell, Hauser, Springer, & Hauser, 2002) and the Midlife in the United States study, conducted by The John D. and Catherine T. MacArthur Foundation Research Network on Successful Midlife Development (Ryff, Kessler, & Brim, forthcoming).

This intensifying interest in midlife is due primarily to the aging of the large Baby Boom population. Between 1990 and 2015, the number of midlife adults (ages 45 to 64) in the United States will increase by 72%, from 47 to 80 million (U.S. Bureau of the Census 2000). The Baby Boom cohort alone represents roughly one-third of the U.S. population. By identifying the antecedents of health and well-being at midlife, researchers will have a fuller understanding of the early risk factors for health decline among older adults.

For example, persons with better health habits in midlife also have longer life expectancies (Fries, 1980) and shorter periods of disability that are compressed into fewer years at the end of life (Vita et al., 1998). Depressive spells throughout the life course (and particularly, at midlife) are associated with elevated risk of late-life health problems, including coronary heart disease (Booth-Kewley & Friedman, 1987); lower levels of perceived and actual control over one's own health outcomes (e.g., Haukkala et al., 2000; Lustman et al., 2000); less frequent contact with health care professionals (Kessler et al., 2001); and poorer compliance with physicians' orders (Carney et al., 1995; DiMatteo et al., 2000; Ziegelstein et al., 2000). Depression also has important consequences for labor force participation, including increased absenteeism and career instability, which bode poorly for late-life economic well-being (Broadhead et al., 1990). An under-

standing of the life course pathways to midlife health is essential for developing policies and interventions which "may help to delay, minimize, or prevent the biopsychosocial changes that occur in later life" (Lachman 2001: xiii).

The Wisconsin Longitudinal Study (WLS), a long-term study of more than 10,000 men and women who graduated from Wisconsin high schools in 1957 and who have been followed for more than 35 years, is ideally suited for exploring the direct and indirect influence of social background on midlife health and well-being. The WLS obtained data on a sample of men and women at ages 18 (in 1957), 36 (in 1975), and 52 (in 1993) and thus it provides a full record of midlife adults' socioeconomic background (including mother's education, father's education, and household income when the respondent was a high school senior), educational aspirations and attainment, family formation, and labor market experiences over the life course. The WLS respondents were born in 1939, and thus precede by about one decade the large Baby Boom cohort. Thus, the midlife experiences of the WLS cohort may provide early indications of the issues that will become increasingly important as the large Baby Boom cohort passes through their 50s and beyond (Hauser et al., 1993).

PATHWAYS FROM CHILDHOOD TO ADULT HEALTH AND WELL-BEING

Social scientists have a long-standing interest in socioeconomic differentials in health and well-being at midlife and older (e.g., Kaplan & Lynch, 1997; Krieger et al., 1997; Marmot et al., 1997; Moss, 1997; Preston & Taubman, 1994). While research has focused overwhelmingly on adults' *own* socioeconomic status (e.g., education, occupation, income, and assets) and its implications for physical and mental health, a growing body of research recognizes that socioeconomic influences on adult health may far precede one's adult status characteristics. The latency perspective proposes that adult health is a *direct consequence* of economic, social, and psychological features of one's early life (Goldman, 2001). For example, adult health may be influenced by early parent-child interactions, the stability of one's childhood home environment (Wadsworth & Kuh, 1997), and other social and economic resources which may affect "coping skills, resiliency, and thus neuro-immune and neuro-endocrine response at the individual level" (Keating & Hertzman, 1999). Biological influences, including physical development during the prenatal period, at birth, and during early childhood and genetic factors transmitted directly across generations are also implicated as powerful influences on adult health (Barker, 1990; Preston & Elo, 1992). The latency perspective would suggest that the statistical

relationship between adult socioeconomic status and health is, in part, spurious because adult health and socioeconomic status are both direct consequences of one's childhood psychosocial, economic and physiological resources.

In contrast, adherents to the pathways perspective underscore the importance of identifying the adult roles, statuses, and experiences that mediate the relationship between early resources and later life well-being (e.g., Marmot et al., 1997; Powers, Matthews, & Manor, 1998). In the case of health inequalities, early social background factors, including parental education and income, are presumed to affect adult health and well-being *indirectly*, by directly influencing one's own social and economic roles in adulthood which, in turn, affect health (Lynch, Kaplan, & Shema, 1997). For example, early economic resources may affect educational attainment, which in turn affects the timing and nature of family role transitions (Maines & Hardesty, 1987; Marini, 1984), the quality of one's job and working conditions including job-related stress and safety (Jencks, Rainwater, & Perman, 1988); access to information regarding health and health care (Winkleby et al., 1992); health behaviors including cigarette smoking, exercise, and diet (Shea et al., 1991; Winkleby et al., 1992); exposure to stressful situations and events (Kessler, 1979; Kessler & Cleary, 1980); and the ability to control one's environment and adopt effective coping strategies (Lachman & Weaver, 1998). Each of these factors, in turn, may have short- and long-term consequences for physical and emotional health.

EARLY LIFE SOURCES OF ADULT INEQUALITIES

A practical implication of the pathways model is that the early life antecedents of adult socioeconomic and health inequities must be identified, in order to minimize (or eliminate) these inequities. The ways that childhood conditions influence adult socioeconomic status, and the persistence of this relationship over the life course is perhaps best explicated by the "Wisconsin Social Psychological Model of Status Attainment" (or Wisconsin model, for short), based on the WLS data (Haller & Portes, 1973; Hauser, 1971; Hauser, Sheridan, & Warren, 1999; Sewell & Hauser, 1975; Sewell, Hauser, & Wolf, 1980; Sewell & Shah, 1967; Warren & Hauser, 1997). In brief, this research has documented the long-term consequences of early social background for adult occupational and economic success; those from richer starting resources go on to enjoy higher levels of educational attainment, occupational status, and earnings at every point in the life course (e.g., Hauser, Sheridan, & Warren, 1999; Sewell, Hauser, & Wolf, 1980).

One of the most important findings generated by the Wisconsin Model is that the effect of early social background on adult occupational and economic status operates *indirectly*, via educational attainment. Using a socioeconomic index which included parents' income, mother's and father's education, and father's occupation, Sewell and Shah (1967) found that young adults from low-resource backgrounds were less likely to make early application to college, to make multiple applications, to know about the possibilities of scholarships, to go to college immediately after high school graduation, and to attend high quality colleges. At the same time, they were more likely to drop out of college and less likely to return to college if they dropped out. The magnitude of these differences is stark; compared to young adults in the bottom quartile of parental socioeconomic status (based on an index of both parents' education, household income, and householder's occupational status), those in the top quartile had a 4 to 1 advantage in entering college, a 6 to 1 advantage in college graduation, and a 9 to 1 advantage in obtaining an advanced degree.

These educational inequities, in turn, set the stage for later-life labor market disparities. Graduates from poorer socioeconomic backgrounds obtain less education and thus have lower status occupations and lower earnings at every stage of the life course. Again, these patterns occur indirectly and in a stepwise fashion; education predicts young adult occupational success, which in turn affects midlife socioeconomic standing (Hauser, Sheridan, & Warren, 1999; Sewell, Hauser, Springer, & Hauser, 2002; Warren, Hauser, & Sheridan, 2001). Midlife occupational success, in turn, brings important benefits including health insurance and pension benefits, which may buffer against late-life decrements in health and financial well-being (e.g., Hauser et al., 1993).

In sum, the Wisconsin Model reveals that early socioeconomic resources are powerful predictors of adult educational and occupational attainment (Sewell et al., 2002). This research provides an important springboard for examining the direct and indirect influences of early socioeconomic resources on midlife health and well-being. Although a large body of research on health disparities persuasively demonstrates that educational attainment and occupational standing are powerful predictors of health and well-being at midlife and beyond, few studies have evaluated the influence of early resources. Thus, the following analysis will investigate: (1) the direct effects of early socioeconomic resources on midlife health and well-being; and (2) the extent to which the long-term effects of early resources on adult health are mediated by one's own education and occupation, family roles, working conditions, health behaviors and access to health care.

DATA AND METHODS

The Wisconsin Longitudinal Study

Analyses are based on data from the Wisconsin Longitudinal Study (WLS). For more than 35 years, the WLS has followed a cohort of 10,317 men and women who graduated from Wisconsin high schools in 1957. The WLS is based on a one-third random sample of all 1957 graduates of public and private Wisconsin high schools. The graduates were re-interviewed at ages 36 (in 1975) and 53 (in 1992). The sample is broadly representative of middle-aged, white American men and women who have completed at least a high school education. Among American women and men ages 50–54 in 1990, roughly two-thirds were whites of non-Hispanic background who have completed at least twelve years of schooling (Komin-ski & Adams, 1992).

However, some strata of American society are not represented in the study. By design, all sample members graduated from high school. Sewell and Hauser (1975) estimated that about 75% of Wisconsin youth graduated from high schools in the late 1950s. Racial minorities are not well represented; only a handful of African American, Hispanic, or Asian persons are in the sample. Roughly one-fifth of the sample is of farm origin, consistent with national estimates of persons of farm origins in cohorts born in the 1930s. Despite these limitations, the WLS provides a long-term look at the development of the life course from adolescence to midlife in a cohort of men and women who resemble a large segment of the U.S. population. The analyses presented in this chapter are based on the 3,003 men and 3,482 women who completed the 1957 questionnaire, the one-hour long 1975 and 1992 phone surveys, and the selected health outcomes assessed on the 1992 20–page mail questionnaire.

Dependent Variables

Three aspects of midlife health are considered: self-rated health, high blood pressure, and depression. *Self-rated health* reflects the respondent's subjective summary interpretation of their own medical and functional status. The item simply asks respondents "How would you rate your health at the present time?" Response categories are very poor, poor, fair, good, and excellent. Despite the simplicity of this measure, it is a powerful predictor of mortality in longitudinal studies (Mossey & Shapiro, 1982), and is highly correlated with health assessments provided by physicians (Ferraro & Farmer, 1999).

One specific physical health condition is considered: *high blood pressure*. In the 1992–93 interview, respondents were asked to indicate which of fif-

teen health symptoms they experienced in the month prior to interview, and which of thirteen illnesses had been diagnosed by a physician. Because of the relatively young age of the respondents at that time (age 52–53), very few reported any illness or symptom. Of the twenty-eight possible health conditions, twenty-five were experienced by fewer than 10% of respondents. The most commonly reported condition was high blood pressure, reported by 23% of men and 20% of women. High blood pressure has been selected as an outcome variable because it is a powerful determinant of morbidity, disablement and inactivity in older people (American Heart Association, 1994). Compared to persons with normal blood pressure, midlife adults with hypertension are believed to have five times the risk of developing coronary heart disease (Katchadourian, 1987).

Depression ($\alpha = .877$) is measured with a modified version of the widely used Center for Epidemiologic Studies Depression Scale (CES-D) (see Radloff 1977 for construct reliability and validity analyses). The scale consists of 20 self-rated items which measure the number of days that a respondent experienced depressive symptoms during the seven days prior to interview. Scores range from 0 to 140, but because the scale is so highly skewed, scores above 67 (i.e., the top 2% of respondents) were recoded to a top score of 67. The twenty symptoms are listed in Appendix A. Depression is considered one of the single best indicators of current psychological health, and it also has implications for the physical and economic well-being of older adults. (Booth-Kewley & Friedman, 1987; Haukkala et al., 2000; Lustman et al., 2000; Kessler et al., 2001).

Independent Variables

The independent variables considered include: socioeconomic background; personal resources; adult status attainment characteristics; adult family characteristics; health behaviors; access to care; and stressful work conditions. These variables were selected based on past theoretical and empirical works examining the pathways linking early economic resources, adult life course experiences, and mid- and later-life health.

Socioeconomic background factors include *mother's and father's years of completed education*; whether the respondent is of *farm background*; and the *family's income-to-needs ratio when the respondent was a high school senior*. Parents' adjusted gross income was obtained from federal tax forms for the years 1957–60. The average income across the three years is used, and is adjusted from 1958 to 1992 dollars using consumer price index data. The income-to-needs ratio was constructed based on parental marital status in 1957, the number of siblings (including the respondent) aged 18 or younger in 1957, and the official 1992 poverty threshold (U.S. Department of Commerce,

1993). A continuous measure of income-to-needs is used in the multivariate analysis, while the poverty line cutpoint is used as a stratifying variable in the descriptive statistics, presented in Table 8.1.

Personal resources include educational attainment, IQ, and indicators of premature parental death. *Educational attainment* is the number of years of formal education completed. *IQ* reflects the respondent's percentile score on the Henmon-Nelson Test of mental ability which was administered during their junior year in high school. The test scores were obtained from the files of the Wisconsin State Testing Service. *Premature parental death* is a potential indicator of one's genetic predisposition for physical hardiness or frailty (Preston & Elo, 1992). Dummy variables indicate whether either parent had died at an age younger than the sex-specific median age at parental death in the WLS.

Own status attainment characteristics include *years of work experience*, and *the major occupational group of one's longest-ever job*. The longest-ever job is the occupation held for the longest number of years; this indicator is used as it provides the best snapshot of one's overall socioeconomic position in adulthood. The major occupational categories considered are *upper white-collar* (i.e., professional and managerial occupations); *lower white-collar* (i.e., sales and clerical occupations); *upper blue-collar* (i.e., crafts occupations); and *lower blue-collar/farm* occupations (e.g., operatives, laborers, farm personnel).

Own family characteristics include *age at first marriage*, *1992 marital status*, and *number of children*. *Health behaviors* include indicators that one is *obese* (i.e., has a body mass index (BMI) of higher than 25); whether one engages in either light or vigorous *physical activity at least once a week*, and two indicators of *smoking*: whether one has ever *smoked for less than ten years*, or *more than ten years*. The reference category includes those who have *never smoked*. *Access to care* is captured with a dichotomous variable, indicating that the respondent does not have health insurance. *Stressful work conditions* in one's current (1992-93) or most recent job are captured with three indicators: perceived high risk of future job loss, hazardous work conditions, and frequent time pressures at work. *High risk of job loss* is a dichotomous variable set equal to 1, if respondents believe that there is a 50% or greater chance that they will lose their job involuntarily in the next two years. *Hazardous work conditions* are captured with a dichotomous variable set equal to 1, if respondents indicated that they were exposed to dangerous conditions on the job. *Frequent time pressures* are indicated with a dichotomous variable set equal to 1, where the reference category includes persons who are never, seldom, or sometimes subject to time pressures at work.

The issue of selection deserves brief mention. I will not evaluate the social selection or downward drift hypothesis, which holds that midlife

socioeconomic standing is a *consequence* of current or earlier physical and mental health (Dohrenwend, Levav, & Shrout, 1992). First, the consensus among most researchers is that although there is some evidence of downward social mobility among persons in poor health, the selection process makes only a minor contribution to the overall association between SES and a wide range of health indicators (see Goldman, 2001, for a detailed review). Second, the WLS obtains indicators of physical health at age 52–53 only, thus it is not possible to evaluate the social selection versus causation hypothesis. Finally, a full explication and evaluation of the social causation versus selection hypotheses is beyond the scope of this chapter.

RESULTS

Bivariate Analysis

Table 8.1 presents descriptive statistics for men and women of the WLS, by childhood poverty status. T-tests were conducted to evaluate statistically significant differences between persons who grew up in households where the income-to-needs ratio fell at or below (versus above) the poverty line. Growing up in poverty is closely tied to other social background characteristics; the poor are much more likely to have been raised on farms (45 versus 12%), and both their mothers and fathers have significantly less education compared to those who grew up in homes above the poverty line. Women who grew up in poverty have significantly higher depression levels at age 53, while both men and women who grew up in poverty have significantly worse overall health at midlife. The risk of high blood pressure at midlife is not related to early poverty.

Consistent with the large body of status attainment research summarized earlier, one's personal resources, adult socioeconomic status, and life course trajectories are closely tied to early socioeconomic resources. Men and women from poor backgrounds have significantly fewer years of education, lower IQs, they marry younger, bear more children, and hold lower status occupations; those from poor backgrounds are significantly less likely to hold professional or managerial jobs in adulthood, and they are far more likely to work in manual jobs. Accordingly, men and women from poor backgrounds are significantly more likely to work in jobs exposing them to hazardous work conditions. Socioeconomic background is associated with adult health behaviors for women only; women from impoverished backgrounds are significantly more likely to be obese at age 53, but they also show one distinct health behavior advantage; they are less likely to be smokers.

TABLE 8.1. Descriptive Statistics by Childhood Poverty Status and Gender, Wisconsin Longitudinal Study, 1957–1993

	Men		Women	
	Above poverty line, 1957	At/below poverty line, 1957	Above poverty line, 1957	At/below poverty line, 1957
<i>Health Outcomes</i>				
Self-rated health, 1993 (1 = poor, 5 = excellent)	4.16 (.66)	4.08* (.66)	4.18 (.67)	4.14+ (.68)
Has high blood pressure, 1993	0.24 (.42)	0.22 (.41)	0.20 (.40)	0.18 (.39)
Depression (CES-D) (13.46)	15.22 (13.62)	14.82 (14.2)	16.7 (16.5)	18.4**
<i>Social Background</i>				
Mother's education	10.79 (2.83)	9.8*** (2.74)	10.59 (2.88)	9.59*** (2.61)
Father's education	10.09 (3.52)	8.89*** (2.96)	10.1 (3.45)	8.45*** (2.86)
Farm background	0.11 (.32)	.45*** (.49)	0.12 (.32)	.46*** (.50)
<i>Personal Resources</i>				
Education (in years)	14.27 (2.57)	13.36*** (2.22)	13.5 (2.08)	12.9*** (1.76)
IQ, measured in 1956 Percentile ranking	55.64 (28.39)	47.87*** (28.52)	54.95 (28.05)	49.19*** (27.31)
Mother died, younger than median age	0.19 (.39)	0.19 (.39)	0.20 (.40)	0.19 (.39)
Father died, younger than median age	0.33 (.47)	0.35 (.48)	0.33 (.47)	0.35 (.48)
<i>Adult SES</i>				
Total number of years worked for pay	31.89 (4.6)	32.66 (4.8)	22.17 (8.82)	22.72 (8.97)
Upper white-collar work, longest job	0.49 (.50)	.35*** (.48)	0.33 (.47)	0.25*** (.43)
Lower white-collar work, longest job	0.14 (.35)	.11* (.31)	0.39 (.49)	0.37 (.48)
Upper blue-collar work, longest job	0.16 (.37)	.22*** (.41)	0.01 (.11)	0.01 (.11)
Lower blue-collar or farm work, longest job	0.20 (.40)	.32*** (.47)	0.19 (.39)	0.29*** (.46)
<i>Family Characteristics</i>				
Age at first marriage	23.9 (3.24)	23.5** (2.88)	21.67 (2.81)	21.46+ (2.89)

TABLE 8.1. *continued*

	Men		Women	
	Above poverty line, 1957	At/below poverty line, 1957	Above poverty line, 1957	At/below poverty line, 1957
<i>Family Characteristics</i>				
Current marital status	0.86 (.34)	0.87 (.34)	0.8 (.39)	.84* (.37)
Number of children (1.5)	2.79 (1.6)	2.99+ (1.69)	2.98 (1.87)	3.26***
<i>Health Behaviors</i>				
Obese (BMI > 25)	0.24 (.43)	0.24 (.43)	0.17 (.38)	0.22** (.41)
Exercises at least once a week	0.58 (.49)	0.57 (.49)	0.54 (.49)	0.54 (.49)
Never smoked	0.39 (.49)	0.4 (.49)	0.51 (.50)	.61*** (.49)
Smoked less than ten years	0.14 (.34)	0.13 (.34)	0.11 (.32)	0.10 (.30)
Smoked more than ten years	0.47 (.49)	0.46 (.49)	0.38 (.49)	0.28*** (.45)
<i>Access to Care</i>				
No health insurance coverage, 1993	0.029 (.17)	0.028 (.17)	0.04 (.19)	0.03 (.18)
<i>Work Conditions</i>				
Greater than 50% of job loss, 1993	0.17 (.38)	0.17 (.37)	0.12 (.33)	0.13 (.34)
Exposed to hazardous work conditions	0.41 (.49)	0.53*** (.50)	0.22 (.42)	.27* (.44)
Frequent time pressures on the job	0.30 (.46)	0.28 (.45)	0.32 (.47)	.29* (.45)
N	2330	673	2709	773

Note: t-tests were conducted to detect significant mean differences, where + $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

Multivariate Analyses

Multivariate models are used to evaluate the pathways linking early social background factors to midlife health among the WLS respondents. Each of the seven sets variables is entered in a stepwise fashion, in order to evaluate the extent to which early social background effects are mediated by adult characteristics and experiences. Table 8.2 presents the predictors of self-rated health, Table 8.3 shows the risk factors for high blood pressure,

TABLE 8.2. OLS Regression Models Predicting Self-Rated Health at Age 53, Wisconsin Longitudinal Study, 1957–1993

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Sex (1 = female)	.033* (.017)	.061*** (.017)	.076*** (.022)	.094*** (.022)	.067** (.022)	.066** (.022)	.063** (.022)
<i>Social Background</i>							
Household income to needs ratio, 1957	.022** (.007)	0.009 (.007)	0.009 (.007)	0.009 (.007)	0.011 (.007)	0.01 (.007)	0.01 (.007)
Mother's education	.012*** (.003)	.007* (.003)	.007* (.003)	.007* (.003)	.007* (.003)	.007* (.003)	.007* (.003)
Father's education	.014*** (.003)	.009** (.003)	.008** (.003)	.008** (.003)	.007* (.003)	.007* (.003)	.007* (.003)
Householder was farmer/farm worker	.034 (.022)	0.032 (.022)	.035+ (.022)	0.032 (.022)	0.013 (.022)	0.012 (.022)	0.013
<i>Personal Resources</i>							
Education		.041*** (.004)	.038*** (.005)	.039*** (.005)	.029*** (.005)	.029*** (.005)	.029*** (.005)
IQ, measured in 1956		0.001 (.001)	0.001 (.001)	0.001 (.001)	0.001 (.001)	0.001 (.001)	0.001 (.001)
Mother died, younger than median age of death		-.002 (.021)	-.001 (.022)	-.001 (.021)	0.001 (.020)	0.001 (.020)	-.001 (.020)
Father died, younger than median age of death		-.030+ (.017)	-.030+ (.017)	-.032+ (.017)	-.021 (.017)	-.021 (.017)	-.022 (.017)
<i>Adult Status Characteristics</i>							
Total number of years worked for pay			.004** (.001)	.005*** (.001)	.005*** (.001)	.005*** (.001)	.005*** (.001)
Lower white-collar job, longest occupation			0.029 (.023)	0.031 (.023)	.041+ (.022)	.041+ (.022)	.038+ (.022)
Upper blue-collar job, longest occupation			-.11*** (.34)	-.11*** (.34)	-.11** (.33)	-.11*** (.33)	-.098** (.33)
Lower blue-collar or farm, longest job			-.078** (.25)	-.079** (.25)	-.071** (.25)	-.070** (.25)	-.061* (.25)
<i>Adult Family Characteristics</i>							
Age at first marriage				0.004 (.003)	0.003 (.003)	0.003 (.003)	0.003 (.003)
Currently married				.064** (.023)	.0648* (.022)	.039+ (.022)	.037+ (.022)
Number of children				0.006 (.005)	.011* (.005)	.011* (.005)	.011* (.005)
<i>Health Behaviors</i>							
Obese (BMI > 25)					-.240*** (.019)	-.239*** (.019)	-.239*** (.019)

TABLE 8.2. *continued*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
<i>Health Behaviors</i>							
Exercises at least once per week					.201*** (.016)	.201*** (.016)	.201*** (.016)
Smoked fewer than ten years					-.43+ (.026)	-.42+ (.026)	-.42+ (.026)
Smoked more than ten years					-.097*** (.017)	-.097*** (.017)	-.097*** (.017)
<i>Access to Care</i>							
No health insurance coverage, 1993						-.112** (.044)	-.114** (.044)
<i>Work Conditions</i>							
Greater than 50% chance of job loss, 1993							-.042+ (.023)
Exposed to hazardous work conditions							-.032+ (.018)
Frequent time pressures on the job							-.005 (.017)
Intercept	3.82 (.036)	3.37 (.057)	3.34 (.091)	3.13 (.116)	3.28 (.116)	3.29 (.116)	3.31 (.116)
Adjusted r-squared	0.015	0.033	0.04	0.041	0.095	0.095	0.096

Note: (1) + $p \leq .10$; * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

and Table 8.4 displays the correlates of depression. Analyses are based on the total sample ($N=6,485$), and gender is controlled in all models. Preliminary evaluations of gender interaction terms revealed that the effect of socioeconomic background conditions on midlife health does not differ significantly for men and women, thus sex-specific models are not shown.

Richer socioeconomic resources at every stage in the life course are associated with better self-rated health at midlife. Although the effects of early social background are mediated largely by personal resources and adult status attainment characteristics, the protective effects of parental education persist in the long-run. Model 1 in Table 8.2 reveals that higher maternal and paternal education, and a higher income-to-needs ratio (at age 18) are significant positive predictors of self-rated health nearly thirty-five years later. After one's own education, IQ, and genetic health predisposition are controlled, the long-term effect of early financial resources is no longer statistically significant, but mother's and father's education remain significant positive predictors of midlife health. Importantly, each additional year of either parent's education is associated with a one-tenth standard deviation increase in self-rated health, and this effect persists even

TABLE 8.3. Logistic Regression Models Predicting Self-Rated Health at Age 53, Wisconsin Longitudinal Study, 1957–1993

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Sex (female = 1)	.81*** (.000)	.76*** (.000)	.75*** (.000)	.75*** (.000)	.80* (.01)	.80* (.01)	.80* (.01)
<i>Social Background</i>							
Household income to needs ratio, 1957	0.98 (.41)	1.01 (.86)	1.01 (.83)	1.01 (.83)	1.00 (.79)		(.79)
Mother's education	.97* (.02)	0.98+ (.10)	.98+ (.10)	.98+ (.10)	0.98 (.12)	0.98 (.12)	0.98 (.12)
Father's education	0.98 (.14)	0.99 (.72)	0.99 (.75)	0.99 (.74)	1.00 (.93)	0.99 (.93)	0.99 (.93)
Householder was farmer/farm worker	.81** (.010)	.83* (.03)	.82* (.02)	.82* (.02)	.84* (.04)	.84* (.04)	.84* (.04)
<i>Personal Resources</i>							
Education		.92*** (.000)	.92*** (.000)	.92*** (.000)	.94*** (.000)	.94*** (.000)	.094*** (.005)
IQ, measured in 1956		1.00 (.49)	1.00 (.37)	1.00 (.37)	1.00 (.48)	1.00 (.48)	1.00 (.48)
Mother died, younger than median age of death		1.33*** (.001)	1.33*** (.000)	1.33*** (.000)	1.34*** (.000)	1.34*** (.000)	1.34*** (.000)
Father died, younger than median age of death		1.19* (.006)	1.19* (.006)	1.19* (.006)	1.17* (.012)	1.17* (.012)	1.17* (.012)
<i>Adult Status Characteristics</i>							
Total number of years worked for pay			0.99 (.84)	0.99 (.82)	0.99 (.68)	0.99 (.66)	0.99 (.65)
Lower white-collar job, longest occupation			0.98 (.86)	0.98 (.85)	0.97 (.71)	0.97 (.71)	0.97 (.71)
Upper blue-collar job, longest occupation			0.97 (.79)	0.97 (.81)	0.98 (.84)	0.98 (.84)	0.97 (.81)
Lower blue-collar or farm, longest job			1.13 (.18)	1.13 (.18)	1.11 (.29)	1.11 (.29)	1.11 (.29)
<i>Adult Family Characteristics</i>							
Age at first marriage				0.99 (.42)	0.99 (.52)	0.99 (.52)	0.99 (.50)
Currently married				1.04 (.62)	1.07 (.46)	1.07 (.51)	1.07 (.49)
Number of children				0.99 (.55)	0.98 (.27)	0.98 (.27)	0.98 (.27)
<i>Health Behaviors</i>							
Obese (BMI > 25)					-.255*** (.000)	-.255*** (.000)	-.255*** (.000)

TABLE 8.3. *continued*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
<i>Health Behaviors</i>							
Exercises at least once per week					.89+ (.09)	.89+ (.09)	.89+ (.09)
Smoked fewer than ten years					0.93 (.48)	0.93 (.48)	0.93 (.48)
Smoked more than ten years					1.09 (.22)	1.09 (.22)	1.09 (.22)
<i>Access to Care</i>							
No health insurance coverage, 1993						0.93 (.67)	0.93 (.67)
<i>Work Conditions</i>							
Greater than 50% chance of job loss, 1993							1.05 (.58)
Exposed to hazardous work conditions							1.02 (.83)
Frequent time pressures on the job							-.99 (.97)
Chi-square; d.f.	31.4;5	87.9;9	91.34;14	92.3;17	286;21	287;22	287;25

Notes: (1) + $p \leq .10$; * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

Odds ratios and p-values are presented.

when a broad array of adult work, family, and health behavior characteristics are controlled.

Consistent with a large body of research on health differentials, the analyses also reveal that advanced education, more continuous work histories, being married, and exercising regularly significantly enhance midlife health. Working in manual labor occupations, smoking, and being overweight significantly reduce overall health. Persons without health insurance also have significantly poorer health; however, because the WLS does not obtain full health histories, it is impossible to ascertain whether poor health is a consequence of limited access to care, or whether a person is not insured due to pre-existing health conditions.

High blood pressure, a widely documented risk factor for late-life cardiovascular disease, is strongly related to social background factors. In contrast, adult life course characteristics and experiences are only very weakly related to midlife hypertension. The results in Table 8.3 provide at least partial support for the latency perspective: high blood pressure is largely a function of early nutrition and social environment, as well as genetic tendencies toward robustness or frailty. Persons who grew up on

Table 8.4. OLS Regression Models Predicting Depression (CES-D) at Age 53, Wisconsin Longitudinal Study, 1957–1993

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Sex (1 = female)	1.87*** (.35)	1.83*** (.36)	1.56*** (.46)	1.20* (.48)	1.25** (.48)	1.28** (.48)	1.40** (.48)
<i>Social Background</i>							
Household income to needs ratio, 1957	-.20 (.15)	-.10 (.15)	-.088 (.15)	.095 (.15)	-.092 (.15)	-.087 (.15)	-.068 (.15)
Mother's education	-.29*** (.07)	-.22** (.07)	-.22** (.07)	-.24*** (.07)	-.23*** (.072)	-.23*** (.072)	-.23*** (.072)
Father's education	-.15* (.06)	-.094 (.062)	-.089 (.062)	-.076 (.062)	-.059 (.062)	-.062 (.062)	-.059 (.062)
Householder was farmer/farm worker	-1.06* (.47)	-1.06* (.47)	-1.22** (.48)	-1.13* (.472)	-1.08* (.473)	-1.06* (.472)	-1.03* (.471)
<i>Personal Resources</i>							
Education		-.079 (.09)	0.082 (.101)	-.037 (.104)	0.023 (.104)	0.031 (.104)	0.059 (.104)
IQ, measured in 1956		-.043*** (.007)	-.037*** (.007)	-.036*** (.007)	-.036*** (.007)	-.035*** (.007)	-.034*** (.007)
Mother died, younger than median age of death		-.195 (.443)	-.214 (.374)	-.191 (.440)	-.175 (.437)	-.170 (.437)	-.176 (.435)
Father died, younger than median age of death		-.044 (.374)	-.035 (.373)	-.080 (.372)	-.159 (.369)	-.143 (.369)	-.086 (.369)
<i>Adult Status Characteristics</i>							
Total number of years worked for pay			-.030 (.028)	-.065* (.029)	-.071* (.029)	-.064* (.491)	-.074** (.491)
Lower white-collar job, longest occupation			.980* (.497)	.937+ (.494)	0.772 (.492)	.783+ (.022)	.897+ (.022)
Upper blue-collar job, longest occupation			1.12 (.731)	1.02 (.726)	0.969 (.722)	0.953 (.721)	0.518 (.729)
Lower blue-collar or farm, longest job			2.83*** (.547)	2.80*** (.544)	2.71*** (.540)	2.68*** (.540)	2.32*** (.548)
<i>Adult Family Characteristics</i>							
Age at first marriage				.141* (.062)	.135* (.062)	.134* (.062)	.118* (.061)
Currently married				-4.45*** (.489)	-4.37*** (.487)	-4.10*** (.491)	-3.90*** (.489)
Number of children				0.076 (.116)	0.024 (.115)	0.017 (.115)	0.011 (.114)
<i>Health Behaviors</i>							
Obese (BMI > 25)					1.85*** (.429)	1.82*** (.429)	1.76*** (.427)

Table 8.4. *continued*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
<i>Health Behaviors</i>							
Exercises at least once per week					-2.67*** (.355)	-2.67*** (.355)	-2.67*** (.355)
Smoked fewer than ten years					0.634 (.559)	0.614 (.559)	0.575 (.302)
Smoked more than ten years					-.162 (.381)	-.187 (.381)	-.210 (.3779)
<i>Access to Care</i>							
No health insurance coverage, 1993						3.60*** (.966)	3.59*** (.962)
<i>Work Conditions</i>							
Greater than 50% chance of job loss, 1993							3.40*** (.491)
Exposed to hazardous work conditions							1.15** (.408)
Frequent time pressures on the job							.771* (.380)
Intercept	20.28 (.77)	22.25 (1.23)	19.54 (1.96)	22.68 (2.49)	23.15 (2.53)	22.56 (2.53)	21.39 (2.52)
Adjusted r-squared	0.012	0.019	0.022	0.035	0.047	0.049	0.057

Note: (1) + $p \leq .10$; * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

farms have roughly a 20% reduced risk of hypertension; this may reflect the fact that farm families—typically from dairy farms in Wisconsin—receive important nutritional benefits, despite their low household incomes (Hauser et al., 1993). The protective effect of a farm background does not change considerably, even when other adult life course factors are controlled. Respondents whose mothers died prematurely have a 33% greater risk of high blood pressure, while those whose fathers died prematurely have nearly a 20% elevated risk of high blood pressure compared to persons with either living parents, or parents who died at or above the sex-specific median age of parental death. These effects also persist net of all other model adjustments.

Education has strong protective effects, and these effects persist (and even increase slightly) when health behaviors—considered an important link between education and physical health—are adjusted. The obese have nearly three times the risk of midlife hypertension, compared to persons with BMIs of less than 25. The WLS data do not show a relationship between hypertension and a broad array of current life course factors,

including occupational roles, family roles, and both physically and emotionally stressful working conditions.

Psychological health at midlife also is enhanced by one's early socioeconomic resources. Persons with highly educated mothers, those from farm backgrounds, and those with higher levels of measured intelligence at age sixteen report significantly lower levels of depression at age fifty-three. The protective effects of maternal education are mediated partly by one's own educational attainment and cognitive ability; however, the effect size and significance levels remains virtually unchanged even after adult work, family and health-related characteristics are adjusted.

Current depression, unlike high blood pressure, is closely related to contemporaneous life circumstances. Being married protects against depression, while persons working in blue-collar jobs, the overweight, those without health insurance, persons with a greater perceived risk of job loss, those working under hazardous conditions, and persons working under strict time pressures report significantly higher levels of midlife depression.

Overall, these analyses reveal several important substantive findings, yet they also highlight the need for refined conceptual and statistical models of early life influences. First, the analyses reveal the persistent effects of early life resources—particularly mother's education—even when a rich and varied array of adult social roles, stressors, and health risk factors are controlled. Second, the relative strengths of early versus adult influences on midlife health vary considerably across outcomes, suggesting that life course scholars should work toward developing disease- and outcome-specific conceptual and statistical models of health differentials. Third, surprisingly little variance in health was explained by these detailed models; only 10% of the variance in self-rated health and six percent of the variance is depression. The low adjusted *r*-square values suggest that individual life course variables—including health behaviors, stressors, and work and family roles—do not adequately explain midlife health differentials, nor do they fully account for the long-term effects of early life conditions. An important avenue for future research may be the identification of early and adult experiences and resources that make one resilient to the harmful long-term health consequences of early disadvantage.

REACTIONS TO EARLY LIFE CONDITIONS

Scholars working in the cumulative disadvantage tradition (e.g., Crystal & Shea, 1990; O'Rand, 1996a, O'Rand, 1996b) have made important strides towards identifying the *risk* factors that heighten the harmful effects of

early life disadvantage. However, far less is known about the *protective* factors that minimize the health consequences of early socioeconomic adversity. Although resilience researchers have identified some factors that protect against the adverse consequences of early disadvantage, this research has focused largely on *short-term* consequences. Overwhelmingly, these studies have focused on childhood poverty, abuse, and separation and then track the relatively short-term outcomes, such as adolescent mental health, social behavior, and academic performance (e.g., Garmezy, 1991; Garmezy, Masten, & Tellegen, 1984; Rutter, 1985, 1987; Staudinger, Marsiske, & Baltes, 1995).

Although status attainment research has focused on the longer-term consequences of early socioeconomic disadvantage, this research has focused exclusively on economic and educational consequences of one's starting resources (see Sewell et al., 2002 for a review). Moreover, this research has been criticized for its implication that early influences are largely deterministic: individuals' interpretations of, reactions to, and strategies for overcoming early and adulthood disadvantage are rarely considered. A large literature on stress and coping has examined reactions to disadvantage (e.g., Lazarus & Folkman, 1984; Pearlin, 1991; Pearlin & Schooler, 1978; Thoits, 1994), yet this literature has had relatively little influence on status attainment research. The assumption that *reactions and adaptations* to early conditions may moderate the long-term impact of these conditions is a guiding principle of two new lines of health research: life history approaches to understanding midlife psychological resilience (Ryff, Singer, Love, & Essex, 1998; Singer, Ryff, Carr, & Magee, 1998); and research on depression as a short-term response to early adversity (e.g., Kessler et al., 1995, 1997; Nesse, 2000). Although these studies focus on mental health outcomes only, they offer a point of departure for developing conceptual models that may explain the long-term influence of early experiences on a wider array of midlife health outcomes.

Life Histories of the Resilient

Why do some persons from disadvantaged social backgrounds thrive in midlife, while others experience poor mental and physical health? To answer this question, Singer and colleagues (Singer et al., 1998) used data from the WLS to ascertain whether distinctive life histories characterized "resilient" women, compared to three other subgroups of midlife women: the depressed (those with a history of depression and high levels of midlife depression), the vulnerable (those with no history of depression, yet very low levels of midlife psychological well-being), and the healthy (those with no history of depression and high levels of psychological well-

being). By definition, resilient women reported at least one episode of serious depression over the life course (assessed with a subset of items from the Composite International Diagnostic Interview), but also reported high levels of psychological well-being at midlife (assessed with the Ryff (1989) six-dimension formulation of well-being).

The researchers hoped to move away from identifying single variables, such as maternal education, that predicted midlife mental health, and instead to identify detailed life histories that characterized those women able to thrive despite early economic adversity. To this end, they identified 168 women in the WLS who fit the mental health profiles of "resilient." Next, they produced individual biographies for randomly selected cases of resilient women; the biographies were based on the women's responses to the 1957, 1975, and 1992 surveys. The biographies were then reviewed for commonalities and were subsequently pared down to more generic descriptions. Characteristics of the women were arrayed by life stage and life domain. The researchers then evaluated statistically whether the life histories of the resilient women were distinguishable from the life histories produced for the three other subgroups of women. Methodological procedures are described more fully in Singer et al. (1998).

These analyses resulted in four life history profiles that distinguished the resilient women. One subgroup, for example, included women from low SES background (e.g., both of the women's parents were high school dropouts). However, these women found personal success in young adulthood; most were in the top tertile of IQ scores, and experienced upward career mobility in young adulthood. They also perceived that their achievements in life compared favorably with their parents and siblings. Singer et al. (1998) observe that the women's resilience may be due in part to the fact that their childhoods were relatively stress-free; despite their poor economic resources, none had parents who were problem drinkers. Moreover, "the low profile on parental education—usually interpreted as a sign of disadvantage—may have made it possible for these women to compare themselves favorably to parents and siblings" (Singer et al., 1998: 27).

Across the four subgroups, the women's advantages and resources varied across life domains, and from this variety emerged differing stories of why the women may have succumbed to depression as well as their routes out of it. Thus, rather than present a uniform characterization of the life trajectories of the 168 women classified as "resilient," these analyses clarified the diverse pathways from early economic adversity to midlife psychological health. This research represents a step toward developing theoretical models that explain the "off-diagonal" cases; those who experience early adversity yet evidence positive mental health at midlife.

Depression as a Reaction to Early Adversity

The ways that early life disadvantage affects one dimension of midlife health—depression—can be further illuminated by considering early depression as a short-term response to early adversity. Recent research suggests that long-term harmful consequences of early disadvantage are exacerbated by early depression, thus socioeconomic differentials in midlife mental health may be understated (or incorrectly specified) in studies that ignore early-life depression. Kessler and colleagues (e.g., Kessler & Magee, 1993; Kessler & Magee, 1994; Kessler et al., 1995; Kessler et al., 1997) point out that an early-life disadvantage may elevate one's risk of depression in the short-term, and this depression both increases one's risk of subsequent depression, and increases one's risk of holding other disadvantaged roles and statuses, such as lower levels of educational attainment, downward career mobility, divorce, and so on.

Theories generated by evolutionary psychologists counter that early life depression in response to socioeconomic adversity may be *protective* in the longer term. From this perspective, early life depression in response to adversity is viewed as adaptive to the individual. It may act as a cue to social network members that additional support is needed, and thus may elicit assistance (Klerman, 1974; Schmale & Engel, 1975). Depression may also cause individuals to disengage from unsuccessful life enterprises and unrealistic aspirations, and thus pursue more viable goals. The mentally healthy, in contrast, may be less aware of the personal and structural constraints to socioeconomic mobility and success (Gut, 1989; Nesse, 2000). For instance, if individuals from poorer social backgrounds strive for (but lack the resources to attain) the same level of socioeconomic success as their more privileged peers, then maladaptive behavior or depression may result (Merton, 1968). In this case, early depression may allow an individual to more accurately assess their options, and to devise life plans more consistent with one's abilities and resources (Nesse, 2000). Clearly, this perspective is controversial and requires further empirical scrutiny and evaluation. Nonetheless, these competing perspectives—that depression is an adaptation, versus depression as an amplifier (and perpetuator) of early disadvantage—may trigger new lines of inquiry among scholars researching the direct and indirect linkages between early socioeconomic resources and midlife health and well-being.

CONCLUSION

This chapter has explored the ways that early socioeconomic resources affect three aspects of health at midlife: self-rated health, high blood pressure, and depression. Two competing theoretical perspectives guided the

analysis. The latency perspective holds that adult health is a direct consequence of social and economic conditions in childhood, while the pathways model explores the ways in which adult life course experiences mediate the relationship between early conditions and adult health and well-being.

The statistical analyses presented in this chapter provide partial support for both the latency and pathways approaches. Importantly, the relative strengths of early and adult predictors of health vary across the health outcomes considered. Midlife hypertension is affected by early life experiences and resources; and these effects are not mediated by adult life course and health experiences. Persons whose mothers and fathers died prematurely have a significantly elevated risk of high blood pressure, while those raised on farms are significantly less likely to have high blood pressure at midlife. Interestingly, adult work and family roles, access to health insurance, stressful work conditions, and smoking behavior were not significantly related to midlife risk of hypertension. In contrast, depression and self-rated health at age 53 are strongly related to contemporaneous life experiences, including marital status, occupational status, exercise, obesity, access to health care and work conditions.

Early resources—especially maternal education—are significant predictors of all three outcomes, and the protective effects of richer starting resources do not attenuate considerably even after one's own educational, occupational, and family trajectories are considered. This finding raises important issues for research and practice. For social gerontologists concerned with eliminating or reducing the sources of midlife and late-life health differentials, it is simply not possible to alter one's early life experiences. Rather, researchers face the challenge of specifying precisely why maternal education enhances health and well-being in the long run. Information on parent-child social interactions over life course interactions, early socialization, the acquisition of positive and persistent health behaviors, and the development of self-efficacy beliefs may provide insights into the long-term and intransigent effects of maternal education on adult well-being.

This analysis also underscores the importance of looking beyond medical and economic risk factors to promote healthy aging, and highlights the importance of considering a broader array of individual and combined protective factors. Even after adjusting for early life conditions, and adult work, family, health behaviors, access to care and working conditions, the statistical analyses presented in this chapter explained only a small share of the variation in midlife health. Health researchers may gain further insights into pathways to positive aging by considering individuals' resilience, and their unique reactions to, and strategies for grappling with socioeconomic disadvantage over the life course.

To date, most health differentials researchers have focused largely on risk factors rather than resilience factors, and typically base their research on the assumption that late-life health and economic inequalities reflect patterns of structured and persistent inequality over the life course. On one hand, this omission is defensible. To emphasize personal reactions to economic adversity would draw attention away from the macrosocial and structural forces that maintain current socioeconomic inequalities. Moreover, individual-level reactions to early disadvantage are more likely to mollify the psychological consequences, rather than the persistent physical or economic consequences, of such adversities. Nonetheless, new insights into the health effects of early life conditions may be gained by considering (and modeling) individual-level reactions and responses to early socioeconomic adversity.

For example, depression as a response to early-life disadvantages may lead to subsequent trajectories of depression, and may also affect occupational and economic stability (e.g., Kessler et al., 1995). Others counter, however, that early depression may elicit much-needed social support (Schmale & Engel, 1975), or may lead an individual to disengage from an unrealistic or unrewarding enterprise, and to channel their efforts towards more productive activity (e.g., Gut, 1989; Nesse, 2000). Although the latter claims have not been subject to empirical scrutiny, the underlying premise—that an individual's responses to early economic and social adversity affect future trajectories—may be a valuable new line of inquiry for exploring social background and its consequences for mid- and later-life well-being.

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APPENDIX A: ITEMS USED TO CREATE CENTER FOR EPIDEMIOLOGIC STUDIES (CES-D) DEPRESSION SCALE (RADLOFF, 1977)

On how many days during the past week did you experience each of the following symptoms:

1. Feel you could not shake off the blues even with help from your family and friends.
2. Feel bothered by things that usually don't bother you.
3. Think your life had been a failure.
4. Feel happy. (reverse-coded)
5. Feel that people were unfriendly.
6. Feel lonely.
7. Enjoy life. (reverse-coded)
8. Have crying spells.
9. Feel that people disliked you.
10. Feel sad.
11. Feel depressed.
12. Have trouble keeping your mind on what you were doing.
13. Not feel like eating, your appetite was poor.
14. Feel you were just as good as other people. (reverse-coded)
15. Feel everything you did was an effort.
16. Feel hopeful about the future. (reverse-coded)
17. Feel fearful.
18. Sleep restlessly.
19. Talk less than usual.
20. Feel you could not "get going."

CHAPTER 9

Late-Life Disability Trajectories and Socioeconomic Status

ROBERT F. SCHOENI

INSTITUTE FOR SOCIAL RESEARCH, UNIVERSITY OF MICHIGAN

VICKI FREEDMAN

POLISHER RESEARCH INSTITUTE, ABRAMSON CENTER FOR JEWISH LIFE

ROBERT WALLACE

DEPARTMENT OF EPIDEMIOLOGY, UNIVERSITY OF IOWA

Interest in disability at the end of life has grown out of both clinical and economic concerns. Clinicians have been largely concerned with developing appropriate strategies for caring for dying patients, most often in the context of palliative care for the cancer patient (Lynn, 1997; Addington-Hall & McCarthy, 1995; Field & Cassel, 1997). Policy-makers have paid particular attention to the economic considerations surrounding high medical costs in the last year of life (Miller, 2001). Approximately one-fourth of all Medicare expenditures occur in the last year of life (Hogan et al., 2001) and this figure has changed negligibly through the years (Lubitz & Prihoda, 1984; Lubitz & Riley, 1993). High medical costs at the end of life are not unexpected among elders because treating progressive and disabling chronic illnesses that are responsible for many deaths often requires substantial clinical resources. Epidemiological evidence suggests about half of all persons who die experience disability in the year prior to death (Guralnick et al., 1991; Lentzner et al., 1992; Palmore & Burchett, 1997; Grabbe, et al., 1995). There is also evidence that disability and time to death explain nearly all the variation in health care costs at the end of life (Cutler & Meara, 1999).

Racial, ethnic, and socioeconomic disparities in late-life disability and health status have been well documented (Bound, Schoenbaum, & Waidmann, 1995; Elo & Preston, 1996; House et al., 1990, 1994; Pope & Tarlov,

1991; Martin & Soldo, 1997). Yet, with few exceptions, the literature on disability at the end of life or more generally on the quality of life in the final years of life (Bradley et al., 2000) has not focused either conceptually or empirically on such inequalities. In an early exception, Cartwright, Hockey, and Anderson (1973) studied the lives and care of a random sample of 785 adults who died in 1968 and 1969 in England and Wales. They found no social class differences in reported symptoms or restrictions or the type of help people needed prior to death, except that working-class people needed more financial help. They concluded, "Death in many respects appeared to be the equalizer it is so often reputed to be" (p. 215).

Hence, it remains unclear to what extent social inequalities exist in the health-related pathways individuals experience before death. The purpose of this paper is to examine socioeconomic differences in disability trajectories experienced prior to death. Unlike the study by Cartwright and colleagues, we draw on prospective data from very large nationally representative samples of Americans who die over a 12-year period. Rather than explore the complexities associated with quality of life, we limit our analysis to measures of disability; that is, the ability to carry out roles or tasks within a specific environment. We develop synthetic trajectories based on population-level experiences at various times from death in order to examine the following questions:

1. How does the likelihood of experiencing disability change as individuals approach death?
2. Do the chances of experiencing disability before death differ for people with different socioeconomic backgrounds?
3. If trajectories are different for people with lower and higher socioeconomic status, why is this the case?

First we provide the motivation and background for the study. The data and methods are described in Section III. Each of the three questions is then addressed and finally, we summarize and interpret the findings.

BACKGROUND

The literature on end-of-life trajectories is highly limited, in part because of the conceptual and methodological difficulties in defining and measuring health among those dying (Bradley et al., 2000). Moreover, we were unable to identify any studies of the U.S. population that focused on socioeconomic differences in disability trajectories prior to death. However, two distinct threads of literature exist that provide insights and motivation for studying socioeconomic disparities in disability trajectories before death. The first set of studies is largely clinical and epidemiolog-

ical in nature, with an emphasis on the quality of individual's lives in the last year or last few months before death. The second set of studies draws upon the basic tools of demography and emphasizes population-level differences in active life expectancy, that is, the average number of years lived in a non-disabled state. Here we provide a brief review of each approach.

Based on Glaser and Strauss's (1968) clinical concept of the *trajectory of dying*, Lynn (1997; 2001) has proposed a model that distinguishes three profiles of death: terminal cancer patients experiencing relatively compressed disability periods; patients with a series of declines and recoveries over a lengthier period of time that die due to organ failure; and those dwindling slowly due to dementia and frailty of old age. The approach characterizes functional status as a function of time to death among those who die. Recent attempts to operationalize these concepts with Medicare claims data from decedents (Lunney et al., in press) suggests that four salient trajectories can be characterized by a combination of medical expenditures, length of illness, and diagnosis. For example, deaths from cancer, entailing a short but expensive period of high expenditures at the end of life (on average \$31,000), describe less than one-quarter of deaths in America. Nearly half of deaths in old age are related to dementia or diseases associated with frailty (costing \$25,000 in the last year of life), less than one in five deaths are associated with organ failure (\$37,000), and about 7% of deaths occur suddenly involving little contact with the health care system (expenditures < \$2,000 in the last year of life). Thus, the nature and severity of the terminal illnesses themselves and important co-morbid conditions clearly help shape the trajectory of disability prior to death. Although socioeconomic differences in these trajectories could not be explored with claims data, the authors show that non-whites are over-represented in the sudden death group.

Disability has also been included as one of many indicators of the quality of end of life (Lawton, 1983). With few exceptions (e.g., Lentzner et al., 1992; Liao et al., 2000), studies evaluating the quality of end of life have most often focused on the experience of select groups of patients, for example, those in hospice care (Mor, 1987; Morris et al., 1986; Bretscher, et al., 1999), with diagnoses of cancer (Addington-Hall & McCarthy, 1995) or dementia (Keene et al., 2001), or living in a concentrated geographic areas (Lawton, Moss, & Glicksman, 1990). Consequently generalizations have been difficult to make. Because the focus of this work has been the dying experience, the window of time has also typically been quite short. For example, one of the most comprehensive studies of the quality of end of life, the Hospitalized Elderly Longitudinal Project, provided descriptions of the quality of the last six months of 417 older hospitalized patients who died within one year of their admission to one of four teaching

hospitals (Somog-Zalud, et al., 2000). Investigators found that during the last six months of life patients reported increasing functional impairments. Yet, Lawton, Moss, & Glicksman's (1990) analysis of retrospective reports with 200 next of kin of Philadelphia community decedents and 150 matched non-decedents suggested that declines began before the first 12-month recall period, with a median period of decline of 14 months. Although information on income, education, and race were collected in both studies, sample sizes were likely inadequate to support analyses of socioeconomic differentials in the end of life experience.

Limited insights into functional difficulties in the last year of life also have been provided by the National Mortality Followback Survey (Lentzner et al., 1992). This retrospective survey involved interviews with proxies for a national sample of decedents in 1986. Lentzner and colleagues found that approximately 14% of all decedents aged 65 years and older were reported to have been fully functional in the last year of life and that 10% were defined as severely restricted. The survey was redesigned extensively and repeated in 1993 (Liao et al., 2000). Although the redesign makes comparisons between the two surveys tenuous (Lentzner, 2000), the 1993 survey shows that about half of all decedents had a functional limitation due to physical or mental condition at some point during the last year of life (NCHS, 1993). Although information on socioeconomic status was collected, changes in functioning during the last year of life cannot be assessed with these data.

Additional insight into social inequalities in disability for a longer period of time before death may be gleaned from the related but largely parallel active life expectancy literature, which describes population-level differences in the expected amount of time various groups spend in a disabled (or non-disabled) state. Estimates of active life expectancy in the United States have revealed large racial (Sullivan, 1971; Crimmins, Saito, & Ingengneri, 1989; Crimmins, Hayward, & Saito, 1996; Guralnik et al., 1993; Hayward & Heron, 1999), economic (Katz, 1983) and education-related (Crimmins, Hayward, & Saito, 1996; Guralnik et al., 1993) disparities in the number of healthy years lived. Black Americans, for example, live fewer years and live a greater proportion of those years in a disabled state with chronic health problems (Hayward & Heron, 1999). Others have focused on the rates that underlie these active life expectancy measures and have noted a racial crossover (Johnson, 2000)—meaning higher rates for blacks at younger ages but higher rates for whites at older ages—in mortality, chronic conditions, and disability. Previously reported racial crossovers in mortality have been attributed to poor data quality (Preston, et al., 1996), but Johnson (2000) relied on prospective data with arguably higher quality age at death and race information and still finds racial cross-over. One of the few studies to calculate active life expectancy by both education and

race (Crimmins, Hayward, & Saito, 1996) suggests that black-white differentials are substantially larger than those for different education groups.

Unlike the clinical approach to dying trajectories, which focuses on individual pathways (Bradley et al., 2000), the active life expectancy literature describes population-level processes. The curves underlying active life expectancy calculations do not represent time to death but instead describe the chances of survival to each age without disability or mortality. Most often such curves are estimated from either cross-sectional data or from information on transitions in short (often two-year) intervals. To date, such studies have not attempted to analyze different measures of socioeconomic status simultaneously, so it remains unclear which measures are most critical in determining end of life trajectories.

In sum, little is known about socioeconomic differences in disability trajectories at the end of life. It could be that differences throughout the life course between blacks and whites, between Americans with economic means and those without, or between those with advanced schooling and those without, accumulate over the lifetime so that socioeconomic differentials in health are exacerbated in the months prior to death. Alternatively, it may be that persons of minority races or low socioeconomic status die at younger ages but experience essentially similar trajectories during the months and years leading up to death.

In this paper we explore socioeconomic differentials in disability preceding death. Using a synthetic approach to estimation based upon fifteen years of national data linked prospectively to death records, we calculate the percentage at each time-to-death with disability by race, poverty status, and education. We also model disability paths in the last years of life, testing for differences by socioeconomic group and where possible exploring reasons for socioeconomic differentials. We investigate two explanations for the disparities in disability profiles. The first hypothesis is that more advantaged populations die at older ages, which confounds the differences in profiles. The second hypothesis is that more and less advantaged people die of fundamentally different causes, and it is these causes that shape disability profiles.

DATA AND METHODS

Data and Sample

We draw upon the 1986 to 1994 National Health Interview Survey (NHIS) for our analysis. The NHIS is a nationally representative annual survey of the non-institutionalized population with over 100,000 sample members in each year conducted by the National Center for Health Statistics (NCHS).

Interviews are conducted typically with a single household member about the health status of all members. Response rates have consistently been over 95%. These data have been linked by the NCHS to the National Death Index (NDI) for the years 1986 through 1997. The linkage is based on variables that are observed in both the NHIS and the NDI, including Social Security Number, first and last name, and month and year of birth.¹ The resulting data file includes information for 54,534 decedents.

The linked NHIS/NDI contain all data elements available in each individual data source, including socio-demographic information (age, sex, race, education, poverty status) and health and disability status from the NHIS, and date and cause of death in the NDI. The focus of the study is death at older ages, which includes the vast majority of decedents; therefore, the analysis is restricted to people who were at least fifty years old when they were interviewed in the NHIS, yielding 39,743 decedents.² Descriptive statistics of this sample are presented in Table 9.1 separately for each of the socioeconomic groups that are examined. We also model the trajectories for a subsample of respondents interviewed within five years of death (N=25,006).

An important limitation of these data is that residents living in institutions at the time of the NHIS interview are excluded. However, people who were not living in institutions at the time of the NHIS interview but subsequently moved into a nursing home are in fact represented. Regardless, many elderly spend the last several months of their lives in nursing homes because their health has severely degraded, and their exclusion from the NHIS sample would cause us to estimate a disability profile that is more rectangular in shape than the profile that exists for the entire population. To the extent that there are important socioeconomic differences in who enters a nursing home before death, and who is frail and living alone, our estimates of socioeconomic disparities in disability profiles may also be biased. For example, if among elderly who are disabled, poor disabled are more likely to live in nursing homes than non-poor disabled (because poor disabled are eligible for Medicaid, which covers the cost of

TABLE 9.1. Descriptive Statistics by Socio-economic Status

	Entire Sample	In poverty?		Education		Race	
		Yes	No	0-11 Years	>= 12 Years	Not White	White
Not limited	0.49	0.35	0.51	0.44	0.54	0.46	0.50
Not disabled*	0.71	0.61	0.72	0.67	0.74	0.62	0.72
Age at interview	71.61	72.23	71.52	73.23	70.23	69.28	71.91
Age at death	76.05	76.59	75.97	77.63	74.70	73.62	76.36
Education 0-11 years	0.46	0.74	0.42	1.00	0.00	0.65	0.44
In poverty	0.13	1.00	0.00	0.20	0.06	0.30	0.10
Not white	0.11	0.27	0.09	0.16	0.07	1.00	0.00
Female	0.47	0.61	0.45	0.47	0.47	0.47	0.47
Number of observations	39,743	5,319	34,424	18,667	21,076	5,871	33,872

*"Not disabled" is available only for people 70 and older; for the entire sample, this leads to a sample size of 23,295.

nursing home expenditures), then we will conclude that shape of the disability profile among the poor is more rectangular (relative to the non-poor) than it actually is.

We are not aware of estimates of nursing home use by time-to-death and detailed socio-demographic and economic factors that would allow us to judge the extent of this bias. However, Spillman and Lubitz (2002), examining people who die at ages 65 and older in the National Mortality Followback Survey, provide estimates of lifetime nursing home use that help assess the severity of this limitation. They find that in 1986, 37.4% of elderly decedents ever entered a nursing home, increasing slightly to 40.5% in 1993. Relatively few people are living in a nursing home more than 12 months prior to death; this share was 18% in 1986 and 20% in 1993. At the same time, almost all elderly decedents who ever used a nursing home did in fact use a nursing home in the last three months of their life. Therefore, the disability trajectories using the NHIS/NDI data provide a less accurate assessment of disability within the last several months of life. Spillman and Lubitz (2002) also provide estimates separately by race and education (but not poverty) and find that elderly decedents with less education are only slightly more likely to use a nursing home; the share ever using a nursing home was 41–42 percent for decedents with less than a high school degree and 37–40 percent for decedents with at least a high school degree (the education groups used in our study). Differences among racial groups were larger but narrowed over this period, with 32% of blacks and 41% of non-blacks ever using a nursing home in 1993. The disability trajectories presented here are therefore biased toward overestimating the differences between racial groups, particularly in the last few months of life.

Key Measures

Disability is measured by activity limitation. Respondents are considered to be limited if they reported that (or the household member reported that he or she had) an impairment or health problem limiting their ability to complete their "major activity" (i.e., working, keeping house, schooling) or any other activity. Major activity is defined differently according to the age of the survey respondent. For household members between 18 and 69 years old, the questions refer to limitations with working, keeping house, or going to school. For household members ages 70 years and older, the questions refer to needing help with personal care activities (e.g., eating, bathing, dressing or ADLs) and routine care activities (e.g., household chores, shopping and getting around or IADLs). The question about routine care activities is asked only if the sample person does not need help with personal care activities; that is, we can determine whether an individual needs help with ADLs or with only IADLs.

In addition to sex and age, we include in our analysis three key measures of socioeconomic status: education, race, and poverty status. After examining differences in disability profiles across various education levels, we determined that two groups—0–11 years of school and 12 or more years of schooling—captured the vast majority of the variation. Two racial groups are identified: whites and non-whites. Poverty status is calculated by NCHS based on questions about total family income (reported in 26 categories), family size, number of children under 18, and the poverty thresholds used by the Bureau of the Census.

We also explore whether socioeconomic differences in disability trajectories are explained by differences in age and cause of death. Cause of death is based on NCHS recodes to the ICD-9 for the primary cause, which is reported in the death certificate. We group the NCHS recodes for primary cause of death into 10 major systems (infections, respiratory disease, cancer, metabolic, senility/Alzheimer's Disease, nervous system, blood and circulatory system, digestive system, accidents, and all others) and also explore a few specific highly prevalent causes of death: cancer (lung, breast or colon and all cancers) and blood and circulatory diseases (myocardial infarction and all blood and circulatory diseases combined).

Methods: Estimating Disability Profiles

The first objective of the paper is to estimate the path of disability as people approach death, which we will call the disability profile. One way to estimate disability profiles would be to use longitudinal data that follow people up until death, with continuous measures of disability. We are unaware of any such data that are nationally representative, have a long enough panel to examine health status 5 to 10 years prior to death, and have sufficient sample sizes to examine various subsamples (e.g., by cause of death, age of death, and SES). Therefore, we employ a synthetic approach.

The NHIS/NDI linked data measure disability status 1 month to 12 years prior to death. To be clear, the data do not have measures of disability at different time points prior to death *for the same person*. However, the data do include measures of disability at different times to death for a cohort of people who were interviewed in a certain year. For example, consider a sample of people interviewed in 1986 at the age of 75. Some of these people died in 1986 shortly after their interview; some died in 1987, some in 1988, and others as late as 1997. So for this *cohort of interviewees*, one can trace out their disability status as many as 12 years and as few as one month prior to death. For those interviewed in 1994 we have profiles as many as three years and as few as one month prior to death. We use this information on disability status and time to death to construct dis-

ability profiles for all NHIS respondents interviewed between 1986 and 1994 who died between 1986 and 1997.

We tested whether the disability trajectories changed over time. We found no detectable pattern in the curves over time nor any statistically significant differences by year in the effect of time to death on disability status.

Statistical Approach

To explore which dimension of socioeconomic status matters most as well as potential explanations for disparities in disability profiles, we estimate a series of logistic regression models in which the dependent variable is an indicator for whether the person does not have an activity limitation. The key explanatory variable in these models is time to death. To enhance interpretability we represent time to death with a five category variable: 0–6 months from death, 7–12 months from death; 13–24 months from death, 25–36 months from death, and 37–48 months from death; deaths 49–60 months from death serve as the reference group. In all models we also include an indicator of whether the interview was completed by the reference person or by a proxy.

To test for differences in the profiles by socioeconomic status, we introduce interaction terms between each measure of socioeconomic status (poverty, education, and race) and months to death. The main socioeconomic effect in these models may be interpreted as the differential between socioeconomic groups (e.g., people in poverty versus people not in poverty) five years before death. The interactions may be interpreted as the socioeconomic differential at various additional time points before death. We explore each indicator of socioeconomic status separately and then we include them all simultaneously to determine which of the indicators is most salient.

Finally, we explore two potential explanations for socioeconomic disparities in disability profiles: differences in age at death and differences in cause of death. In doing so, we estimate a series of cause-of-death specific models in which we interact socioeconomic status and age with months from death.

RESULTS

How Does the Risk of Disability Change As Death Approaches?

Figure 9.1 displays the disability profile using both the activity limitation (lower curve for ages 50+) and the ADL/IADL measures of disability (upper

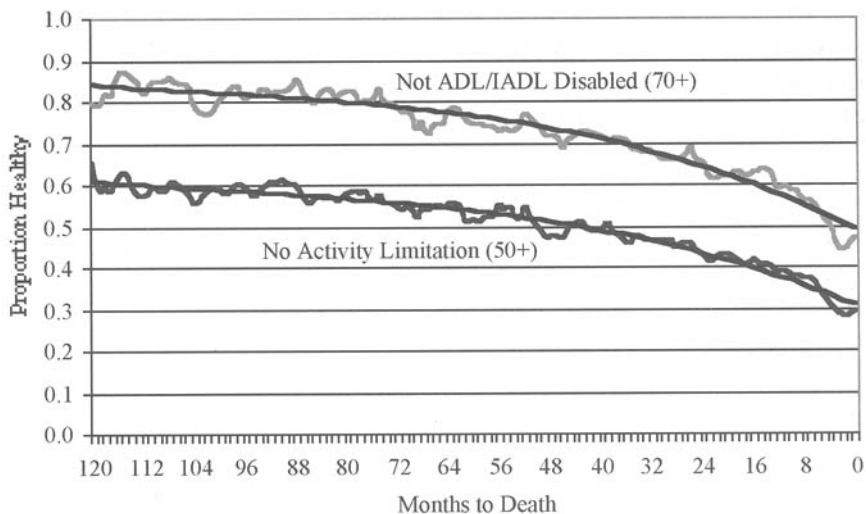


FIGURE 9.1. Disability Profile Prior to Death

curve for 70+ only). The profiles demonstrate that even 10 years prior to death, 40% of the sample has an activity limitation. Therefore, a substantial amount of the change in disability status occurs many years prior to death. The rate of degradation of active life of the cohort is relatively constant during the 2–5 years prior to death. For example, the percentage without an activity limitation declines roughly linearly between the periods 60 months and 12 months prior to death. However, the percentage without a limitation declines rapidly in the last 12 months prior to death.

The disability profile is far from rectangular; that is, the share that is not disabled falls slowly many years prior to death. However, about one-half of decedents were not disabled even during their last few months of life, suggesting that a substantial portion of decedents are relatively healthy just prior to dying. As mentioned above, a sizeable percentage of decedents, particularly those over the age of 70, are in the nursing home their last year of life and not included in the NHIS sample. One way to investigate the bias generated from this data limitation is to include the institutionalized population into the prevalence estimate displayed in Figure 9.1. It has been estimated that roughly 24% of all elderly decedents are expected to spend more than one year in a nursing home prior to death. Therefore, roughly 24% of elderly in their last year of life are living in a nursing home, and we will assume that they are all ADL/IADL disabled. The remaining 76% who are in their last year of life are not in nursing homes (i.e., they are represented in

the NHIS), with 50 percent being disabled. Therefore, among the total population, i.e., 24% with disability rate of 100 and 76% with disability rate of 50%, the disability rate is roughly 62%, meaning that a large share of the population is not disabled even in the last year of life.

The intercepts of the two profiles are different because the two measures are picking up different levels of disability. However, the general shapes of the profiles are fairly similar. Moreover, in the subsequent analyses the substantive conclusions are similar for disability and activity limitations. Given these similarities, the rest of the analyses are based on activity limitations as the health measure.

Do Disability Profiles Before Death Vary by Socioeconomic Status?

Figures 9.2–9.5 report profiles identical to those in Figure 9.1, but separately by education, poverty status, race, and sex of the decedent. A cubic fit to the disability profile is also displayed on each figure. Consistent with numerous previous studies, the figures demonstrate that more educated people and people not in poverty are less likely to be disabled. Moreover, these gaps exist at comparable months to death. That is, it is well established that age-adjusted disability rates are lower for people of higher SES, but we further demonstrate that for people who are the same number of months away from death, disability is less likely for the more advantaged group. For example, the proportion of people two years from death (i.e.,

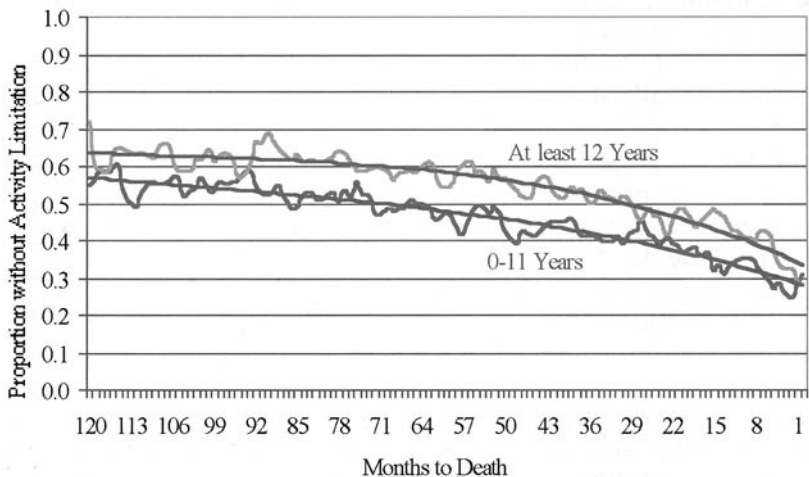


FIGURE 9.2. Disability Profile Prior to Death by Education

18–30 months) who are not limited is 45% for those not in poverty and 28% for those in poverty, a difference of 17 percentage points.

The socioeconomic status gap in disability diminishes as people approach death. In the case of poverty, the share that does not have an activity limitation 0–6 months prior to death is 31% for those not in poverty versus 22% for those in poverty. Therefore, the difference in the prevalence in activity limitation between the two groups narrowed from 17 percent-

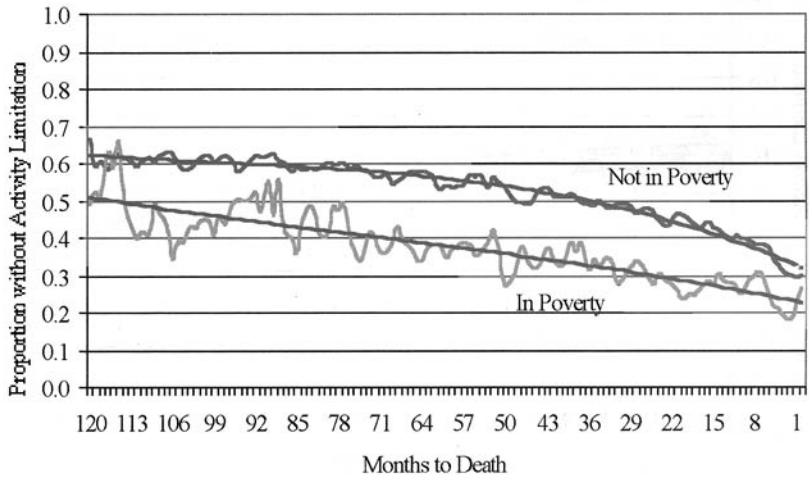


FIGURE 9.3. Disability Profile Prior to Death by Poverty Status

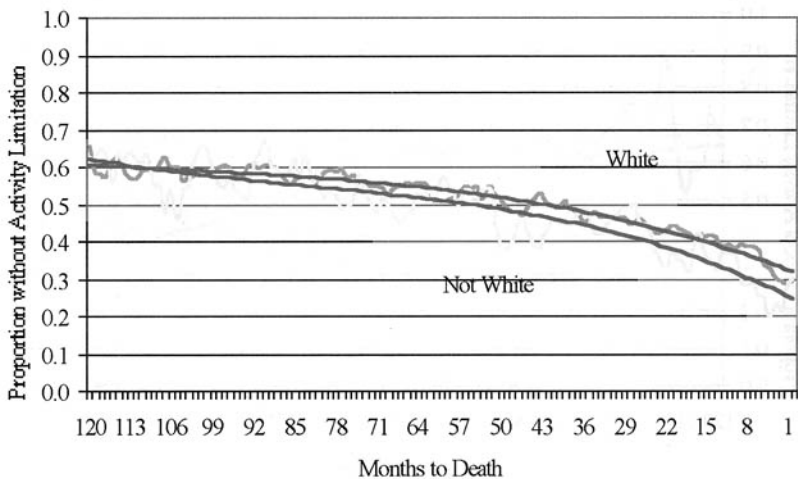


FIGURE 9.4. Disability Profile Prior to Death by Race

age points two years prior to death to nine percentage points in the last six months of life. This general pattern of narrowing of differentials between the more advantaged and less advantaged populations as they approach death is observed for classifications by education as well. Three years prior to death (i.e., 30–42 months) the differential in the prevalence of not being limited is ten percentage points (52% versus 42% for the more versus less educated groups), with the differential falling to five percent-

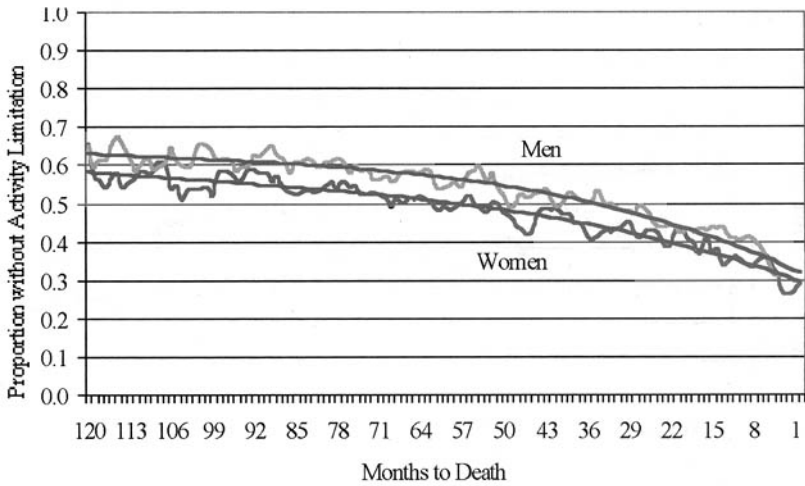


FIGURE 9.5. Disability Profile Prior to Death by Sex

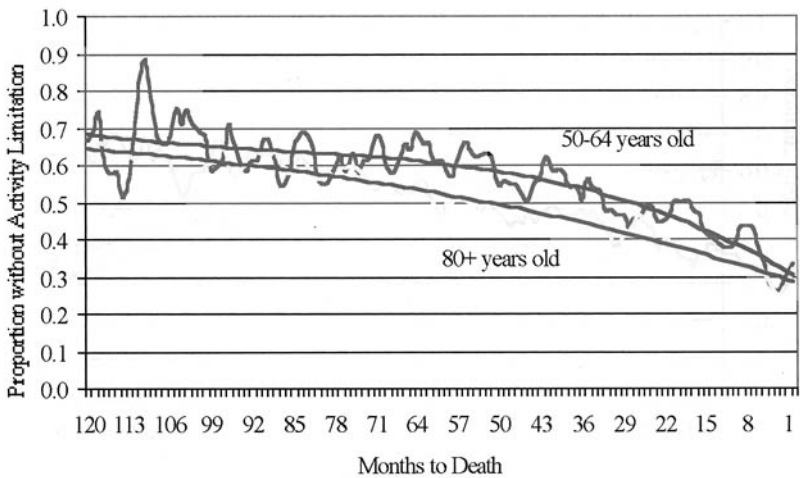


FIGURE 9.6. Disability Profile Prior to Death by Age at Death

age points (33% versus 28% for the more versus less educated groups) in the last six months of life. Despite the fact that the gap narrowed, there are still substantial differences in disability just prior to death.

An exception to this pattern is seen in the figure demonstrating racial disparities (Figure 9.4). Unlike the patterns for poverty and education, the gap between whites and non-whites increases as they approach death. Eight to ten years prior to death there is very little difference in the prevalence of limitations, with roughly 55 to 60% of both groups not limited. By the time the cohorts are within the last six months of life, a gap of 6 percentage points has arisen. This pattern suggests that disparities in disability between whites and non-whites of similar age may be largely due to the fact that the non-whites die at much younger ages. For example, two 50 year-old men—one black and one white—may differ in health status because the black man has a shorter life expectancy and therefore is more likely to be disabled or in poor health. If differences in life expectancy or time-to-death were accounted for, then the age-adjusted racial differences may diminish.

Why Do More Advantaged Populations Have Steeper Disability Profiles?

In Table 9.2 we present odds ratios from a series of logistic regression models in which the outcome is not having an activity limitation. The first model in Table 9.2 replicates the pattern observed in Figure 9.1 for activity limitations. That is, the odds of not having an activity limitation increase the closer to death. Relative to people 49–60 months from death, the odds of being free from limitation for people 37–48 months from death are 11.6% lower. For people just 0–6 months from death, the odds of not being limited are 57.3% lower.

The remaining models in Table 9.2 interact the disability profile with each of the SES factors, again replicating the information reported in Figures 2–5. For example, Model 2 demonstrates that the odds of not being limited are lower for people in poverty (i.e., odds ratio of 0.402). However, the interaction of the poverty indicator with the months-to-death indicator variables implies that the gap diminishes the closer they are to death. For example, the odds ratio associated with the interaction of the indicator for poverty status and the indicator for 0–6 months (1.552) implies that the disparity between the poor and non-poor is substantially lower in the last months of life.

Model 7 in Table 9.2 includes all SES factors in the model at the same time and finds that poverty status remains a strong predictor, changing very little once all other factors are included. On the other hand, differences by education and race are reduced in the broader model.

TABLE 9.2. Logistic Regression Models Dependent Variable: No Activity Limits

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
	Odds Ratio	t-stat	Odds Ratio	t-stat	Odds Ratio	t-stat	Odds Ratio	t-stat	Odds Ratio	t-stat	Odds Ratio	t-stat	Odds Ratio	t-stat	Odds Ratio	t-stat
Months from death ^a																
37-48	0.884	-3.03	0.855	-3.59	0.871	-2.47	0.890	-2.66	0.850	-2.87	0.893	-2.79	0.848	-2.37	0.855	-2.22
25-36	0.789	-5.88	0.765	-6.14	0.754	-5.09	0.759	-6.31	0.776	-4.51	0.798	-5.58	0.735	-4.45	0.748	-4.15
13-24	0.650	-10.55	0.629	-10.54	0.620	-8.53	0.652	-9.68	0.610	-8.79	0.659	-10.16	0.601	-7.29	0.605	-7.12
7-12	0.558	-11.33	0.530	-11.53	0.502	-9.76	0.563	-10.27	0.553	-8.54	0.568	-10.95	0.508	-7.85	0.517	-7.58
0-6	0.426	-16.14	0.403	-16.07	0.401	-12.64	0.429	-14.86	0.385	-13.42	0.433	-15.82	0.373	-11.17	0.383	-10.76
Poverty (1=in poverty)																
Main effect			0.402	-10.07									0.464	-8.06	0.464	-8.04
*37-48 months from death			1.316	2.23									1.326	2.18	1.317	2.12
*25-36 months from death			1.283	2.03									1.216	1.51	1.209	1.46
*13-24 months from death			1.217	1.53									1.177	1.22	1.162	1.12
*7-12 months from death			1.440	2.25									1.387	1.94	1.363	1.83
*0-6 months from death			1.552	2.68									1.492	2.35	1.491	2.35
Education (1=0-11 years)																
Main effect					0.629	-7.81							0.704	-5.72	0.726	-5.16
*37-48 months from death					1.038	0.46							0.998	-0.02	0.993	-0.08
*25-36 months from death					1.107	1.25							1.054	0.62	1.042	0.47
*13-24 months from death					1.107	1.24							1.059	0.67	1.071	0.80
*7-12 months from death					1.267	2.29							1.219	1.86	1.214	1.81
*0-6 months from death					1.157	1.37							1.084	0.74	1.055	0.49
Race (1=nonwhite)																
Main effect							0.790	-2.80					1.008	0.10	0.976	-0.27
*37-48 months from death							0.975	-0.22					0.924	-0.66	0.933	-0.57
*25-36 months from death							1.306	2.33					1.221	1.66	1.240	1.77
*13-24 months from death							0.973	-0.23					0.883	-1.02	0.874	-1.09
*7-12 months from death							0.977	-0.16					0.835	-1.22	0.836	-1.20
*0-6 months from death							0.954	-0.31					0.833	-1.16	0.858	-0.96
Sex (1=female)																
Main effect									0.744	-5.01			0.794	-3.83	0.811	-3.45
*37-48 months from death									1.076	0.91			1.038	0.45	1.041	0.48
*25-36 months from death									1.018	0.22			0.978	-0.27	0.969	-0.37
*13-24 months from death									1.120	1.38			1.076	0.88	1.084	0.96
*7-12 months from death									0.987	-0.13			0.947	-0.52	0.949	-0.50
*0-6 months from death									1.223	1.89			1.166	1.43	1.144	1.24
Age																
Main effect											0.987	-4.66			0.990	-3.29
*37-48 months from death											1.003	0.73			1.002	0.55
*25-36 months from death											1.004	1.14			1.005	1.11
*13-24 months from death											0.999	-0.23			0.997	-0.76
*7-12 months from death											1.002	0.49			1.000	-0.08
*0-6 months from death											1.010	1.98			1.009	1.68
Proxy vs self interview ^a																
Partial self	0.806	-4.25	0.776	-4.98	0.817	-3.97	0.809	-4.18	0.768	-5.17	0.797	-4.47	0.759	-5.37	0.755	-5.46
Full proxy	0.954	-1.40	0.916	-2.62	0.933	-2.07	0.959	-1.24	0.918	-2.55	0.940	-1.85	0.878	-3.82	0.872	-3.98
Don't know	1.001	0.00	0.991	-0.06	1.032	0.19	1.004	0.02	1.023	0.13	1.002	0.01	1.040	0.23	1.035	0.20

^a-Reference group for months to death is 49-60 months. Reference group for proxy vs self is full self response. Number of observations equals 25,006.

One potential explanation for the SES differences in disability profiles is disparities in age at death. That is, the profiles are influenced by age at death, and since more advantaged populations have higher life expectancy, the SES differences might be explained by gaps in mortality. However, the empirical evidence provides no support for this claim; when we control for age in Model 8 of Table 9.2, the differences by poverty status are unchanged. Moreover, as shown in Figure 9.6, for any given time to death, people who die at older ages are less likely to be healthy. Therefore, adjusting for age actually reinforces the fact that the disability profiles are more rectangular in shape among the more advantaged populations.

Another potential explanation for the differences in disability profiles is disparities in causes of death. However, we find no evidence in support of this claim either. As shown in Table 9.3, the causes of death are fairly similar across education, poverty, and racial groups. Moreover, when we estimate the profiles separately for people dying of specific causes—e.g., cancer and circulatory problems, which account for 29% and 45% of all deaths in this sample, respectively—the gap between people who are in poverty and those who are not continues to hold (Table 9.4).

SUMMARY AND INTERPRETATION

Disparities in health by education, race, income, wealth, and other indicators of socio-economic status have been widely documented. The gaps hold true over time, across countries, and across the life course. However, disparities in disability in the final years and months of life have not been examined. Are more advantaged populations healthier right up until the final months and days prior to death? Or are the disparities in health status that are observed between rich and poor at each age an artifact of disparities in life expectancies? That is, at any given age, are less advantaged groups closer to death, which is why they are less healthy?

Our findings suggest that within the limits of our data, there is clear variation in the levels and trajectories of disability and activity limitations in the years immediately prior to death, associated with income and education in the same manner as rates for disability and morbidity in other age groups, including older people. While disability differentials narrow somewhat in the last six months of life, possibly related to the overriding impact of the specific terminal illnesses, they remain substantial. Moreover, the small differences in nursing home use by education documented by Spillman & Lubitz (2002) suggest that these changes probably cannot be attributed to the fact that the NHIS/NDI data are limited to people who were living in the community at the time they are interviewed. A

TABLE 9.3. Cause of Death by Socioeconomic Status

Cause of death	In poverty?		Education		Race		Sex	
	Yes	No	0-11 Years	≥ 12 Years	Not White	White	Male	Female
Infections	0.014	0.015	0.014	0.015	0.025	0.013	0.014	0.015
Respiratory diseases	0.106	0.094	0.102	0.089	0.073	0.098	0.102	0.087
Pneumonia	0.035	0.030	0.033	0.029	0.031	0.031	0.033	0.028
COPD	0.052	0.050	0.053	0.048	0.029	0.053	0.055	0.045
Cancer	0.233	0.294	0.255	0.313	0.279	0.287	0.294	0.277
Colon	0.020	0.027	0.021	0.031	0.025	0.026	0.022	0.031
Lung	0.070	0.088	0.081	0.089	0.082	0.086	0.103	0.064
Breast	0.019	0.020	0.015	0.023	0.018	0.020	0.000	0.042
Metabolic	0.039	0.032	0.033	0.032	0.052	0.030	0.029	0.037
Diabetes	0.033	0.024	0.025	0.026	0.044	0.023	0.023	0.028
Senility/AD	0.006	0.005	0.005	0.005	0.003	0.005	0.004	0.005
Nervous system	0.010	0.016	0.012	0.018	0.010	0.016	0.014	0.017
Blood & circulatory	0.479	0.449	0.484	0.427	0.442	0.455	0.448	0.459
Old myocardial infarction	0.117	0.121	0.127	0.115	0.100	0.124	0.133	0.107
Acute myocardial infarction	0.113	0.122	0.130	0.112	0.090	0.124	0.124	0.117
Heart failure	0.025	0.018	0.022	0.016	0.020	0.018	0.015	0.023
Digestive system	0.058	0.051	0.052	0.052	0.064	0.050	0.045	0.060
Accidents	0.031	0.027	0.026	0.030	0.030	0.028	0.033	0.022
All others	0.025	0.018	0.018	0.019	0.021	0.018	0.017	0.021

Tabulations are based on the sample used in the logistic regression analyses presented in Table 9.2.

TABLE 9.4. Logistic Regression Models, by Cause of Death Dependent Variable: No Activity Limitation

	Lung, Breast or Colon Cancer		Any Cancer		Myocardial Infarction		Blood and Circulatory System	
	Odds		Odds		Odds		Odds	
	Ratio	t-stat	Ratio	t-stat	Ratio	t-stat	Ratio	t-stat
Months from death~								
37-48	0.765	-1.91	0.762	-2.94	0.918	-0.96	0.859	-2.31
25-36	0.853	-1.15	0.723	-3.60	0.881	-1.39	0.804	-3.32
13-24	0.584	-3.91	0.606	-5.64	0.705	-3.84	0.650	-6.44
7-12	0.452	-4.75	0.423	-7.97	0.637	-4.00	0.622	-5.71
0-6	0.240	-8.30	0.213	-13.59	0.574	-4.99	0.542	-7.38
Poverty (1=in poverty)								
Main effect	0.423	-3.32	0.407	-4.97	0.486	-3.63	0.389	-6.75
*37-48 months from death	0.768	-0.72	0.956	-0.18	1.299	0.99	1.530	2.30
*25-36 months from death	1.194	0.52	1.115	0.45	0.894	-0.41	1.346	1.60
*13-24 months from death	1.170	0.42	1.121	0.46	0.976	-0.09	1.356	1.57
*7-12 months from death	2.237	1.77	1.910	2.12	1.461	1.11	1.336	1.17
*0-6 months from death	1.914	1.33	2.452	2.74	1.152	0.42	1.475	1.67
Age								
Main effect	0.985	-1.56	0.995	-0.76	0.991	-1.46	0.989	-2.44
*37-48 months from death	1.007	0.56	0.995	-0.59	1.006	0.77	1.008	1.26
*25-36 months from death	1.010	0.79	1.000	0.02	0.998	-0.24	1.005	0.85
*13-24 months from death	1.010	0.77	1.002	0.24	0.998	-0.28	0.993	-1.21
*7-12 months from death	1.023	1.49	1.007	0.71	1.012	1.16	1.003	0.41
*0-6 months from death	1.043	2.62	1.028	2.56	0.993	-0.70	0.999	-0.13
Proxy vs self interview~								
Partial self	0.697	-2.52	0.785	-2.57	0.904	-0.99	0.789	-3.09
Full proxy	1.224	2.10	1.111	1.63	0.967	-0.47	0.851	-3.13
Don't know	2.464	1.61	1.576	1.34	1.308	0.83	1.023	0.09
Number of observations	3253		7155		5962		11340	

~Reference group for months to death is 49-60 months. Reference group for proxy vs self is full self response.

surprising finding is that racial differences in disability, which have been found to be quite large at other ages, are small even several years prior to death, and they do not diminish as death approaches. The extent to which racial differences in age at death account for racial differences in age-specific disability rates should be explored more closely in the future.

Our data do not help explain the reasons for the socio-economic differentials we uncovered. Neither age at death nor cause of death appear to explain the differences. Categories such as "cancer" and "heart disease" are large and heterogeneous groups of conditions with potentially very different natural histories and outcomes. Yet, when grouped they still yield distinctive patterns that distinguish them from each other, and from other major causes of death. However, there may be other causes of the differential that cannot be explored here, including biological and clinical factors such as genetic variation, lifelong environmental exposures, including occupational and other environmental exposures, personal behaviors and substance use, and access to and utilization of high quality medical and social services throughout the lifespan as well as at the end of life. An important corollary question is how much of the terminal trajectory of disability is carried over from a lifetime of health experiences and how much is directly related to events in the last years of life. There may also be important cultural differences according to socio-economic status, where personal and family choices are made about late life and terminal illnesses that can affect this trajectory.

Irrespective of the underlying mechanism, our study suggests social inequalities exist in the health-related pathways individuals experience before death. Such a finding has implications for both clinicians and policy-makers interested in end of life issues. For the clinician, such findings underscore that the development of appropriate strategies for dying patients must be made with sensitivities to social and economic context. Those of poor socioeconomic backgrounds who are dying on average have experienced disability and its accompanying physical, economic, and psychological consequences, for more years than those from advantaged backgrounds. Similarly, for the policy-maker such disparities underscore the need to target health promotion and disease prevention strategies to disadvantaged populations early in life. Identifying the specific causes of the deterioration in health status during early and mid-life among the disadvantaged population should play a prominent role in our research agenda.

NOTES

1. For further description of the matching methodology, see the NHIS/NDI documentation (NCHS, 2000).

2. All observations with missing data are eliminated from the analysis, representing 15% of the sample. Almost all of the observations with missing data (97%) are due to missing information on poverty status. Given that the cases with missing data account for a non-trivial share of the sample, we re-estimated the analyses without dropping the observations for which poverty status was missing, and we augmented the regression models with an indicator of whether the observation had missing poverty status, and the disability profile was allowed to be distinct for this group by interacting the "missing poverty status" indicator with the five dummy variables that represent months from interview. The SES gaps changed very little; therefore, we report the results that drop the observations for which poverty status is missing.

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CHAPTER 10

Saving, Public Policy, and Late-Life Inequality

ANNAMARIA LUSARDI
DARTMOUTH COLLEGE

JONATHAN SKINNER
DARTMOUTH COLLEGE AND NATIONAL BUREAU OF ECONOMIC RESEARCH

STEVEN VENTI
DARTMOUTH COLLEGE AND NATIONAL BUREAU OF ECONOMIC RESEARCH

In the past two decades, the personal saving rate in the United States has declined dramatically, from 10.6% of disposable personal income in 1984 to a low of 1.0% in 2000 before rebounding somewhat in the first three quarters of 2001. There is considerable debate over the reasons for the decline in the saving rate, as well as about the usefulness of the rate as an indicator of saving. A wealth effect arising from stock market capital gains has been the primary suspect, but even this explanation has not been supported unanimously (e.g., Parker, 1999; Poterba & Samwick, 1995; Hassett, 2000). Some view the decline in personal saving as a harbinger of future financial distress (Bryant, 2001), while others have suggested that the focus on National Income and Product Accounts (NIPA) personal saving is too narrow and ignores important components of saving, such as capital gains, education, and durables (Gale and Sabelhaus, 1999; and others).

In this paper, we first make three general observations about the behavior of the saving rate and its usefulness as an indicator of the well-being of future retirees. The first is that stock market capital gains and losses *are* affecting the measured rate of personal saving. One pathway is the conventional wealth effect in which capital gains lead households to consume more. Conversely, stock market capital gains do not appear in NIPA income since the doubling of a stock's price does not cause an increase in the measurable flow of income. Since the net effect of stock market wealth

is to increase consumption, with no influence on measured income, the net impact of capital gains is to reduce NIPA saving, i.e., the difference between after-tax income and consumption. A similar story holds for stock market losses that should exert a positive influence on personal saving rates. Empirical estimates from the literature, while exhibiting wide variation, suggest that appreciating stock market wealth from 1988 to 2000 has reduced personal saving by as much as two-thirds.

There is another pathway as well. Even without any change in spending behavior on the part of consumers, personal saving in the NIPA will tend to fall in the presence of capital gains (and rise in the presence of capital losses). For example, in past years defined benefit (DB) plans were an important source of household saving, but as the stock market was booming, they became a drag on household saving. The appreciating stock in pension funds restricts firm-level contributions and, as noted above, has little influence on income. Since DB retirement benefits are largely spent, but are not counted as income, the secular increase in DB benefits that are largely consumed also tends to drive down measured saving rates.¹ By the same token, growing capital gains tax revenue reduces disposable income and hence saving even if consumption does not change at all (Reinsdorf & Perozek, 2000; Peach & Steindel, 2000; Poterba, 2000). We estimate that these accounting effects can cause another one-third of the decline in NIPA personal saving from 1988 to 2000.

Our second observation is to emphasize that NIPA personal saving is not a useful measure of whether households are prepared for retirement. For example, financial capital gains throughout the 1990s may have depressed NIPA saving, but they have also been a boon to households saving for retirement. In 1999, saving rates that included capital gains were more than 40%, in contrast to the 2.4% rate for the personal saving rate that excluded capital gains. When the stock market is declining, the effect goes the other way; our estimated saving rates including financial capital gains was -22.4% for the first three quarters of 2001.

Of course, only households that participate in equity markets are influenced by the fluctuations in the stock market. Thus the boom may have increased both the average level of financial preparation and the level of wealth inequality of future retirees. However, there remains a significant group of households in the United States that do not appear to have adequate resources for adverse economic events or for retirement. Late-life inequality in wealth is large in the United States and, in particular, there are many households that hold little wealth, even a few years away from retirement. We show below that most households hold higher levels of wealth in 1998 than in 1989, but there remain a core of low-wealth households in both years. Our third point is that neither lower personal saving rates, nor stock market booms and busts, had any impact on a

significant swath of households who just don't appear to save much of anything.

The appropriate policy approach to this problem depends crucially on why saving is so low. If households save little because of high time preference rates or generous retirement benefits, then perhaps there is little additional role for government policy. If, on the other hand, households save little because of a failure to perceive the need to save, inability to plan, financial illiteracy, lack of discipline, or other explanations, one might argue that there is a basis for additional government intervention. For example, saving reforms could include encouraging saving rates among the lowest income groups (those subject to heavy asset-based means testing), and pension reforms could encourage firms to expand pension coverage to uncovered workers and to reduce the degree of risk they face in their investments.

MEASURING SAVINGS: SOME PRELIMINARIES

The first issue we face in describing empirical facts about household or personal saving is a measurement problem: how do we measure saving? We consider this question at both a theoretical and empirical level (see also the discussion in Browning and Lusardi (1996) and in the paper by Smith in this volume).

Theoretical Measurement of Saving

At a theoretical level, it is straightforward to measure saving. Letting W_{it} denote wealth for person i at time t , then saving S_{it} is defined as after-tax income Y_{it} minus consumption C_{it} , or accounting explicitly for components of Y_{it} ,

$$S_{it} = r_{it}W_{it-1} + E_{it} + M_{it} - T_{it} - C_{it}$$

where r_{it} is the individual-specific rate of return (which may or may not include "unexpected" capital gains or losses), E_{it} are earnings, M_{it} transfers from the government (plus private pensions), T_{it} taxes, and C_{it} consumption.

We can use this basic identity to consider how saving measures are constructed at the macroeconomic level. As it turns out, the key assumption has to do with the return on wealth. When constructing household saving from the NIPA accounts, r_t , aggregated over households, measures a flow of income from assets, such as interest payments on bonds, dividends on stocks, and so forth. From this measure of saving, capital gains are entirely excluded.

Alternatively, one may allow the return on wealth to reflect capital gains revaluations as well. In this case, both income and saving will tend to be substantially larger during periods of appreciating asset prices, and smaller during downturns. This measure of saving tends to fluctuate considerably with the vagaries of the stock market, and is more informative about how well households are accumulating assets for retirement or other contingencies, as well as their ability to consume in the long term. The real difference between the two measures of saving lies in whether the return on capital includes or excludes capital gains.

Empirical Measurement of Saving

Three different personal saving rates are regularly calculated and widely reported. The first is the NIPA saving rate assembled by the Bureau of Economic Analysis (BEA) of the Department of Commerce. Roughly speaking, personal saving is total income less personal consumption outlays and taxes. A second widely reported saving rate is the Flow of Funds Accounts (FFA) compiled by the Federal Reserve Board. This measure is based on the net acquisition of assets and differs from the NIPA measure in several minor and one major respect: the FFA treat expenditures on consumer durable goods as saving whereas the NIPA treats them as personal consumption. To facilitate comparisons between the FFA and NIPA measures the Federal Reserve Board also publishes a third saving rate (FFA – NIPA basis) based on FFA sources but excluding consumer durables.

The three saving rates are shown in Figure 10.1. All show the same basic trends. In particular, the well-publicized and well-documented downward trend in saving since the mid 1980s is evident in all three series. An even more pronounced decline in the 1990s is also quite clear. In 1999 the saving rates are 2.2% of disposable income in the NIPA, 5.2% in the FFA, and 2% in the FFA excluding durables. Over the past two decades the NIPA rate averaged 10.2% in the first half of the 1980s, and fell to 8%, 7.6%, and 4.2% in the next three five-year periods. The NIPA saving rate has since fallen to 1% in 2000. A negative rate had previously been reported as early as 1998. However, this was under the previous methodology and has since been revised upward.²

The NIPA and adjusted FFA measures of saving explicitly exclude any capital gains and losses. We can assess the impact of omitted capital gains by constructing an alternative saving measure based on changes in asset balances using the National Balance Sheets (NBS) published by the Federal Reserve Board.³ The NBS provide estimates of financial and tangible assets valued (for the most part) at market prices. We construct two saving rates based on changes in the market value of wealth. The first constructed measure, labeled NBS - Net Worth, is the change in net worth

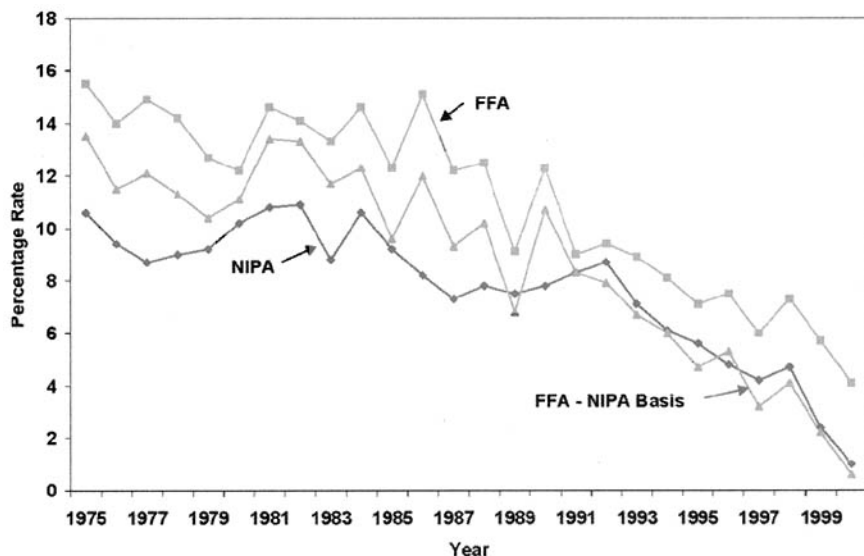


FIGURE 10.1 Reported Savings Rate

expressed as a percentage of an expanded income measure that adds the capital gains to disposable income. The second, labeled NBS - Financial Assets, is the change in financial assets expressed as a percentage of yet another expanded income measure that augments disposable income with financial capital gains. The two saving rates are shown in Figure 10.2. Given what we know about the volatility of asset prices, it should not be surprising that these estimates show enormous year-to-year variation. These wealth based saving rates bear little resemblance to the NIPA and FFA series. In particular, the trends in the 1990s are starkly different. The market wealth measures show a dramatic increase in saving between 1994 and 1999, peaking at 41.1% of disposable income in 1999 before plummeting to -22.4% in the first three quarters of 2001.

How Much of the Saving Decline is Due to the Wealth Effect?

What has been the effect of these large capital gains? The sharp increase in stock market wealth has been suggested as one of the main culprits for the decline in (NIPA) saving and much of the media attention has been focused on the stock market wealth effect on consumption. Assessing the importance of the wealth effect is, however, no easy task.

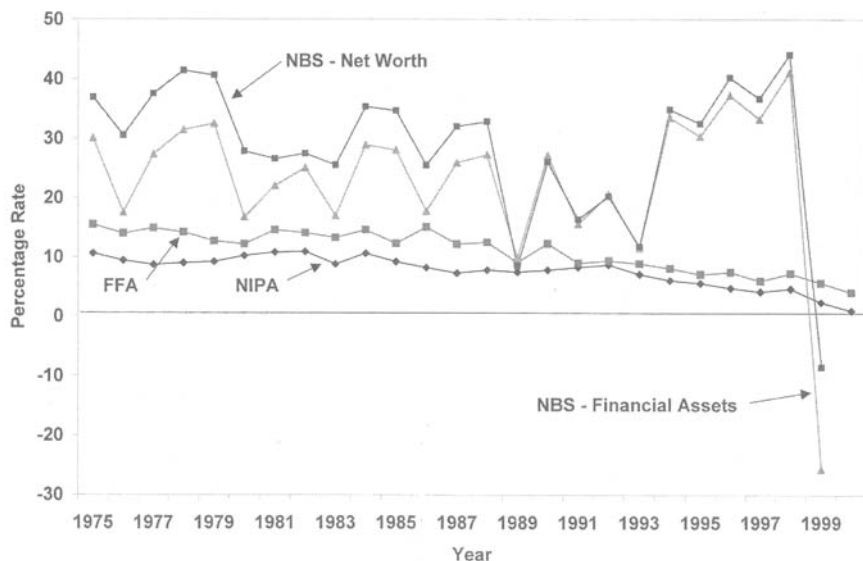


FIGURE 10.2 NIPA, FFA, and NBS Measures of Saving

Aggregate estimates, such as those included in the Federal Reserve Board FRB/US model (see Brayton & Tinsley, 1996), indicate that an additional \$1 of stock market wealth raises the level of aggregate spending by around 3 cents. More recent estimates (see Ludvigson & Steindel, 1999) suggest that the effect of total wealth on consumption is closer to 2 cents for each \$1 of total wealth. Estimates, however, tend to be different across time periods. This is not surprising. After all, the stock market run-up has been concentrated in a short period of time (increases are very steep from 1995 until 2000), and most aggregate studies have not explicitly modeled the sources of shocks to aggregate wealth. Poterba (2000), for example, argues that on basis of lottery experiments, larger gains in wealth trigger proportionately stronger economic responses than small gains.⁴

There are reasons, however, to question the aggregate estimates. One reason is that the channel could be "indirect," i.e., stock prices may simply lead economic activity and forecast an increase in production and employment that will also translate into higher consumer spending.⁵ An additional problem with aggregate estimates is that they represent an average across different types of consumers. However, not everyone in the economy is a stock-holder. According to the Federal Reserve Board's SCF only half of the U.S. population hold stocks, and the top 1% of equity holders account for as much as 53% of household holdings of stocks (Poterba, 2000). This has led some observers to question whether the truly wealthy

could possibly spend enough of their stock market gains to make a dent in aggregate saving (Hassett, 2000).

Disaggregated or micro-level data can help to sharpen our understanding of the wealth effects on consumption. Maki and Palumbo (2001) combine data from the Flow of Funds with data from the SCF to examine saving rates and wealth-to-income ratios of selected demographic groups over time. As expected, families in the uppermost 20% of the income distribution experienced the largest increase in net worth-to-income ratios. These same families also decreased their NIPA-equivalent personal saving rates the most, from 8.5% in 1992 to 2.1% in 2000.

Dynan and Maki (2000) further use individual level data from the Consumer Expenditure Survey (CEX) to estimate the effect of stockholder wealth on consumption. They showed that the spending of stockholders was positively related to stock market returns and was stronger when the sample was limited to those with greater stock-holdings. Furthermore, they showed that the households with the largest imputed capital gains also experienced the largest jumps in consumption. Although the noisiness of the CEX data limited the precision of their estimates, the authors estimate a marginal effect of stock market wealth on consumption in the range of 2 to 12 cents. Other studies using micro data find evidence of more modest effects on consumption (Starr-McCluer, 2000; Parker, 1999; Poterba & Samwick, 1995).

While there is considerable uncertainty surrounding the precise value of the marginal propensity to consume (MPC) out of wealth from the microeconomic evidence—particularly since micro-level data typically miss the consumption behavior of the very wealthy who hold much of the stock market wealth—the data at the macroeconomic level are reasonably robust, and a measure of 3 to 4 cents per dollar of stock market wealth is not inconsistent with the evidence.

Real stock market capital gains, calculated by summing Federal Reserve Board measures of capital gains in household corporate equities and mutual funds, adjusted for nominal inflation using the chain-weighted GDP deflator, yield \$7.88 trillion between the first-quarter 1988 and the fourth-quarter 2000, expressed in 2000 dollars. A 3-cent wealth effect, therefore, implies a decline in the personal saving rate of 3.4 percentage points, or about half of the overall decline in saving between 1988 and 2000.⁶ A 4-cent wealth effect implies a 4.5% decline in personal saving, or two-thirds of the decline.

Two qualifications need to be made for these figures. First, in making these calculations, we have not considered the wealth accumulated in pensions, such as DC plans. However, as we discuss extensively later on, capital gains on pensions have been very large. If we incorporate after-tax DC wealth in our calculations and we use the estimate of an MPC between

3 and 4 cents, we find that an additional 0.8 to 1.1% of the decline in saving can be explained by DC pension capital gains. Thus, if consumers respond to capital gains on pensions, the conventional wealth effect could be as high as four-fifths of the decline in saving between 1988 and 2000.

Second, if enormous capital gains in the mid to late 1990s are, in part, responsible for the decline in saving over this period, shouldn't the stock market collapse in 2000 and 2001 have triggered a rebound in the saving rate? Between 1999 and the third quarter of 2001, the value of financial wealth declined by over \$4 trillion dollars. Using a conservative wealth effect of 3 cents suggests that saving should have *risen* by nearly 2% of disposable income. And while saving rates did jump up in August and September of 2001, it is likely that the Bush income-tax rebates, as well as the September 11th attacks, had an effect on saving; by November 2001 personal saving rates had again fallen to 0.9%. One possibility is that changes in consumption lag changes in wealth, and we should expect to see the saving rate rebound in the coming months. Another possibility is that people treat gains and losses asymmetrically; there is certainly evidence based on changes in housing values that supports this view (Skinner, 1996; Engelhardt, 1996). The magnitude and abruptness of the recent change in wealth may provide the strongest test yet of the effects of changes in wealth on consumption.

How Much of the Decline in Personal Saving is Due to the Treatment of Retirement Accounts?

Capital gains also work through other channels. In this section, we consider how large levels of capital gains may influence the accounting definition of personal saving in NIPA. Under normal circumstances, these influences are small in magnitude and exert only a small influence on measured saving. However, the dramatic swings in capital gains during the latter 1990s have had somewhat perverse effects on measured personal saving.

We first consider the role of retirement accounts. The principal sources of retirement saving are defined benefit (DB) and defined contribution (DC) plans sponsored by employers and personal saving plans such as Individual Retirement Accounts (IRAs). Assets in these plans have grown dramatically over the past two decades. Between 1975 and 1998 the ratio of assets in these plans to income increased more than five-fold (see Poterba, Venti, & Wise, 2001). Although assets in both DB and DC plans have grown enormously, annual contributions to each plan type have taken different paths. Contributions to DB plans have leveled off since the mid 1980s. Reasons for this trend include changing industrial composition and changing regulatory climate (see Gustman & Steinmeier, 1992). Of particular relevance are recent federal policies that have effectively linked DB

contributions to asset market performance. In 1974 ERISA set minimum funding requirements for DB pensions. When stock and bond prices increased, many firms responded by cutting back on pension contributions. More recently, the 1987 Omnibus Budget Reconciliation Act redefined "full funding" and limited pension assets to no more than 150% of the legal liability (the balance firms must hold to pay future benefits). Funds up against this ceiling could no longer make tax-deductible contributions to their pension plans. In addition, increases in "reversion taxes" have discouraged firms from offering DB plans and have limited the amount that can be contributed to them (see Bernheim & Shoven, 1988; Ippolito, 1998).

During this same period contributions to DC plans have grown dramatically. Most of this growth has been in 401(k) plans—so called voluntary contribution plans—which grew rapidly after 1982. The third component of private retirement saving, IRA plans, also grew quickly following a legislative change in 1981, but were curtailed significantly by the Tax Reform Act of 1986. Strictly speaking, contributions to IRAs are not counted as income in the NIPA accounts (like 401(k) employer contributions). However, since 1986 when IRA contributions were largely curtailed by income limits, a significant fraction of new IRA assets are rollovers from employer-based pensions; thus we consider IRAs together with the other pension plans. By 1999 private and public pension plans held about \$10 trillion of assets, while IRAs held another \$2.6 trillion. The size of the retirement saving sector doubled between 1994 and 1999, to a large extent because of massive capital gains inside the retirement accounts.

The problems associated with the treatment of retirement savings in the NIPAs run much deeper than simply omitting capital gains.⁷ A booming asset market means that, by NIPA conventions, resources flowing into the retirement sector will lag resources flowing out of the sector. To see this, note that the NIPA income components—contributions, interest payments, and dividend earnings—are logged in the year in which income is earned. Distributions (and the resulting NIPA consumption) occur when pension or IRA benefits are paid out. This makes sense from the perspective of an individual: over the first part of the life-cycle a worker diverts some income to savings and, in later years, a worker receives and consumes retiree benefits. Recall that retiree benefits are not a component of NIPA income.

However, funny things happen when this NIPA convention is applied to the cohort of post-war workers who were most likely to hold DB pension plans. In a fully funded system with capital gains, the rate of growth of contributions will be less than the rate of growth of benefits as a large share of benefits will be paid out of the fund's internal accumulation. This alone will drag down the NIPA saving rate. The problem is exacerbated by the host of legal and regulatory restrictions (discussed above) that further depress contributions. If asset prices are booming, pension plans

can, in principle, pay benefits entirely from sales of appreciated assets and remain fully funded. In the extreme case where all returns are realized as capital gains, the pension sector pays benefits which both raises consumption and triggers a tax liability which lowers NIPA income.

How serious of a drag on NIPA saving might this phenomenon be? Assume for the moment that all benefits paid are consumed. Then in each year the contribution to NIPA saving is:

$$\{\text{Saving}\} = \{\text{Contributions}\} + \{\text{Interest and dividend earnings}\} - \{\text{Benefits paid}\}$$

Since the mid-1980s distributions from DB plans have exceeded contributions. In 1997, the most recent year for which data are available, employers contributed about \$30 billion to DB plans, but disbursed about \$97 billion of benefits. Moreover, interest and dividend earnings in this year amounted to only \$28 billion. More generally, DB plans (and, to a lesser extent, IRA plans) have had distributions well in excess of income components throughout the 1990s. In contrast, among DC plans, many of which are recently established 401(k) programs, contributions have always outpaced distributions. Trends for DB, DC and IRA plan contributions and distributions are presented in Lusardi, Skinner, and Venti (2001) and Poterba, Venti, and Wise (2001).

To illustrate the effect of these trends on the measured saving rate, Figure 10.3 shows the net contribution to NIPA saving for DB, DC, and IRA plans during the years 1988–2000.⁸ This net contribution is simply the difference between NIPA income components (contributions plus investment earnings) and NIPA consumption (equal to benefits if pension benefits are fully consumed). The contribution of DC plans to NIPA saving is large and positive in all years. DB pension plans reduce NIPA saving in all years since 1988, and the amounts are increasingly large in recent years. The net contribution of IRA plans has been negative since 1994. Thus, for example, NIPA saving is lower by \$60.7 billion in 2000 because of transactions involving DB plans. This is the amount by which benefits paid exceeded income components. DC plans, however, generate positive saving flows of \$58.4 billion in 2000. Like DB plan participants, IRA holders tend to be older, so by 2000 outflows exceed inflows by \$35.7 billion.⁹

Figure 10.4 illustrates what the NIPA saving rate would be without transactions involving DB, DC, and IRA plans. Of the 6.8 percentage point drop in the NIPA saving rate between 1988 and 2000 (from 7.8% to 1.0%), fully 2.1 percentage points is explained by the NIPA accounting of inflows and outflows for pension plans. Put another way, since about 1996—when the two lines in Figure 10.4 cross—retirement saving accounts have contributed *nothing* to NIPA saving.

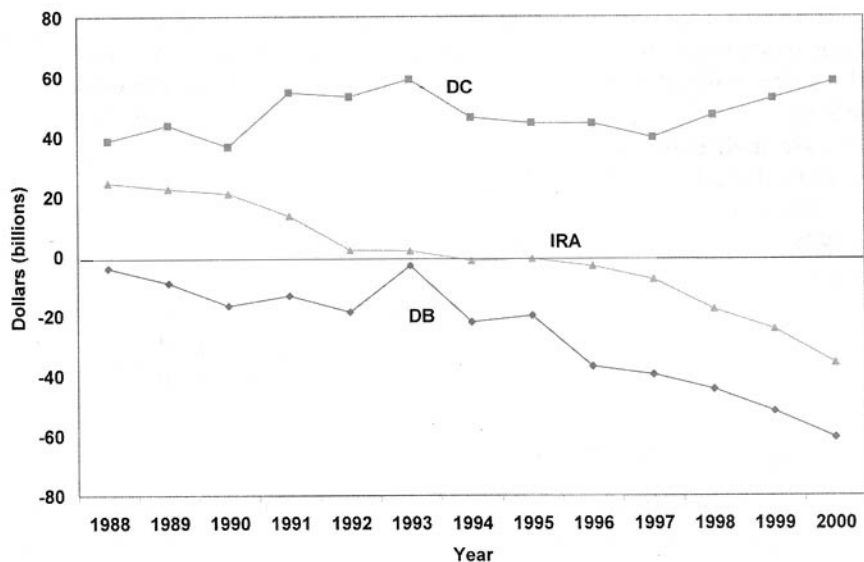


FIGURE 10.3 Contribution of DB, DC, and IRA Plans to NIPA Personal Saving

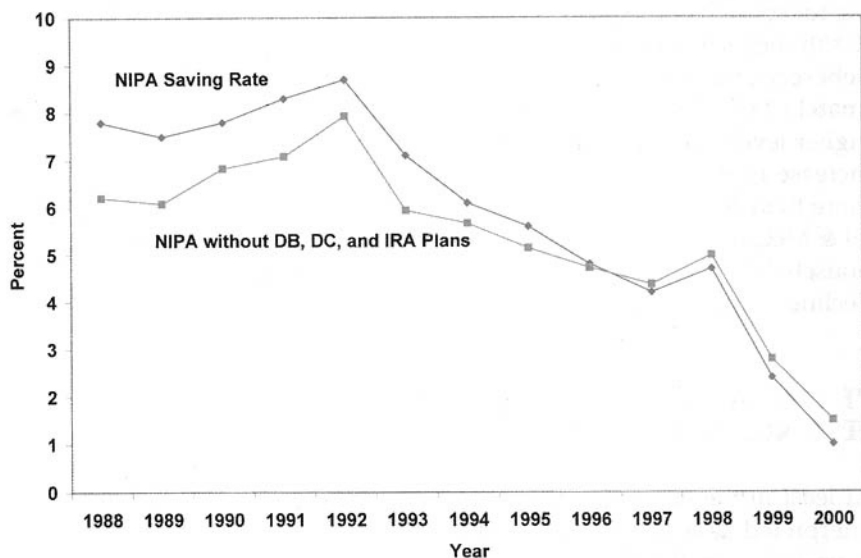


FIGURE 10.4 NIPA Saving Rate with and without DB, DC, and IRA Plans

The second way in which accounting conventions affect personal saving is when individuals sell appreciated stock and pay capital gains taxes.¹⁰ The gains realized do not affect income, but the taxes paid reduce disposable income. Even under the extreme assumption that individuals do not increase their consumption when they realize capital gains, NIPA saving would still decline (DPI). Estimates from Reinsdorf and Perozek (2000) suggest that capital gains taxes as a fraction of disposable income were 0.9% in 1988, but had risen to 1.9% in 1999, or an increase of 0.7 percentage points in government tax revenue. To summarize: these two adjustments (retirement accounts plus capital gains taxes) yields a shift of 2.8% of DPI from personal saving to government plus corporate saving, and account for more than one-third of the decline in saving between 1988 and 2000.

Is Rising Debt the Problem?

The increase in debt as a fraction of income was not a major cause in the decline in personal saving. From the Federal Reserve Flow of Funds accounts, the biggest factor accounting for the drop in the FFA measure of household saving (which excludes capital gains) was the fall in the purchase of financial assets, from 13.3% of disposable personal income in 1988 down to 4.1% in 2000. The net increase in liabilities increased only slightly, from 7.4% of DPI in 1988 to 8.1% in 2000.

While the level of debt may not have been important for aggregate personal saving, it is worth checking to see whether it can explain low saving for specific households, a topic we consider in more detail below. Maki (2000) shows that the debt service burden, defined as households' required debt service payments relative to DPI, is at a relatively high level (approximately 14% of disposable personal income). However, similar and even higher levels were reached in the mid-1980s. One disturbing trend is the increase in the fraction of families for whom debt payments amount to more than 40% of income, which has been rising over time (see Kennickell & McCluer, 2000). While the debt burden is clearly a concern for many households, it was not likely to have been the driving force behind the decline in aggregate saving.

PERSONAL SAVING AND HOUSEHOLD FINANCIAL SECURITY

At least in the news media, the declining personal saving rate has been interpreted as a disturbing trend for the financial security of American households. In this view, the declining personal saving rates make households "vulnerable to financial disaster" (Bryant, 2001). On the other hand,

the stock market has strongly affected the wealth of many households (see Figure 10.2), at least when the market was booming. How have these trends affected the financial security of U.S. households?

Aggregates tell us little about wealth accumulation among specific individual households. Here we consider the record by looking at the distribution of wealth (i.e., accumulated saving plus capital gains) at the micro level. We first try to establish how widespread low savings or low wealth is in the population. Which groups fail to save? We then consider changes in either saving or wealth over time.

A Look at Micro Data: Late-life Inequality in Wealth

There is little question that saving rates vary with income and that low income explains the low level of saving of many older households. However, the amount of variation in saving even after accounting for income is often underestimated. Figure 10.5 presents the 10th, 30th, 50th, 70th, and 90th percentiles of total wealth as a fraction of lifetime earnings for each of 10 lifetime earnings deciles for households headed by a person between the age of 51 to 61.¹¹ It is clear that a large segment of the population saved

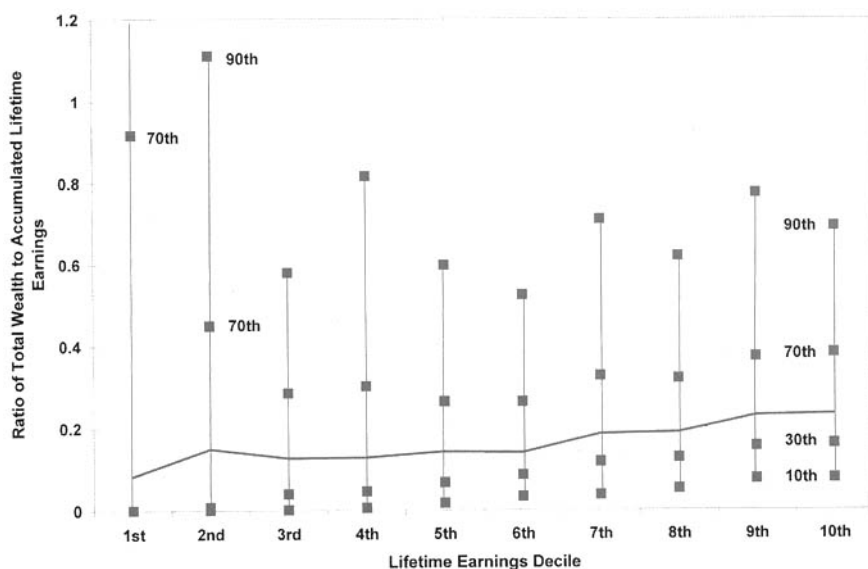


FIGURE 10.5 The 10th, 30th, 50th, 70th, and 90th Percentiles of the Ratio of Total Wealth to Lifetime Earnings, by Lifetime Earnings Decile

Source: Authors' calculations from the 1992 HRS.

The 90th percentile for the 1st earnings decile (not shown) is 4.09

nothing. Many of these households have low lifetime earnings, but significant numbers of higher lifetime earnings households have saved small amounts as well. It is also clear that some low earnings households manage to save relatively substantial amounts. And of course, some households, particularly those with high lifetime earnings, accumulate a great deal.

It is likely that those households that accumulated substantial wealth by the early 1990s benefitted most from the stock market run-up. Whether via direct holdings, mutual funds, or retirement accounts, households that participated in the stock market have witnessed their wealth increase at a rapid pace in the 1990s. As shown in Figure 10.2, the saving rate inclusive of capital gains has increased, not decreased, during the 1990s. In addition, the expansion of retirement programs has helped many households improve their retirement financial security. Thus, irrespective of a declining NIPA saving rate, for many households the prospects for retirement are much better than they were a decade ago.

To analyze how capital gains in the 1990s have affected wealth of retirees and near-retirees, we compare the ratio of wealth to income in 1998 to the ratio in 1989 for households with heads age 50 and over, using data from the Survey of Consumer Finances; these are shown in Figures 10.6a and 10.6b.¹² The first figure shows the ratio of net worth (financial assets, business assets, and property less debts) to income. First note the tremendous variability in wealth holdings among this group; 25% of households over age 50 hold net worth (including housing) less than two times annual income, while 10% of households hold more than fifteen times annual income. There is a noticeable, but small, change in this measure of wealth beginning at about the tenth percentile of the distribution. There is a modest, but uniform, upward shift in wealth for the top half of the distribution; at the 50th percentile the mean ratio was 4.44 in 1998 and 3.89 in 1989. It is worth noting that the same figure, calculated for all ages (Lusardi, Skinner, & Venti, 2001), shows smaller changes in the wealth to income ratio for households in the bottom half of the distribution. This suggests that the benefits of the stock market boom in the 1990s increased the wealth of a larger proportion of older households than of households of all ages.

Net worth is, of course, dominated by housing and business assets that did not show the same sharp increase that is observed for stock prices. The results for financial assets in Figure 10.6b are more striking. There is virtually no change for the lower fifth of the distribution. However, there is a substantial increase in financial wealth between 1989 and 1998 for the upper half of the distribution. At the 50th percentile the ratio of financial assets to income increased from 0.71 to 1.13 and at the 75th percentile the ratio increased from 2.48 to 3.37. This suggests that a large fraction of the

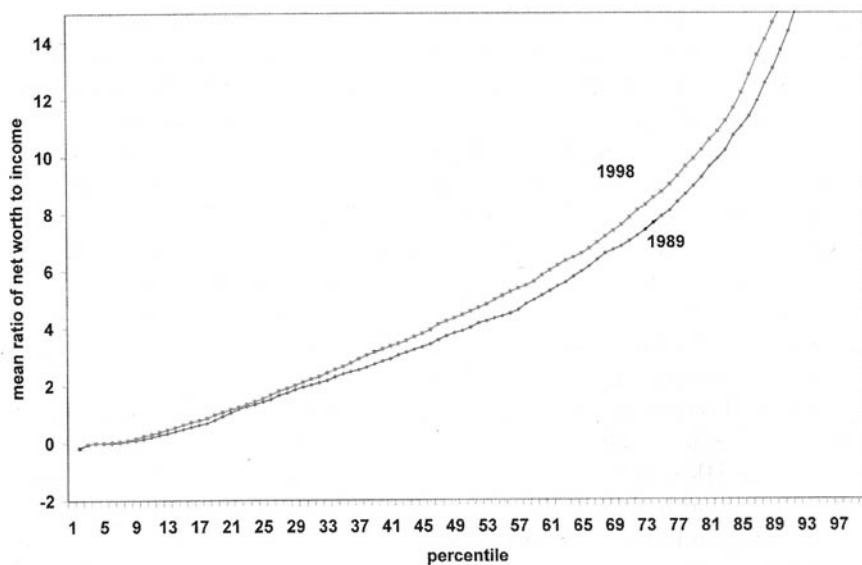


FIGURE 10.6a Ratio of Net Worth to Income for Households Over Age 50, 1989 and 1988

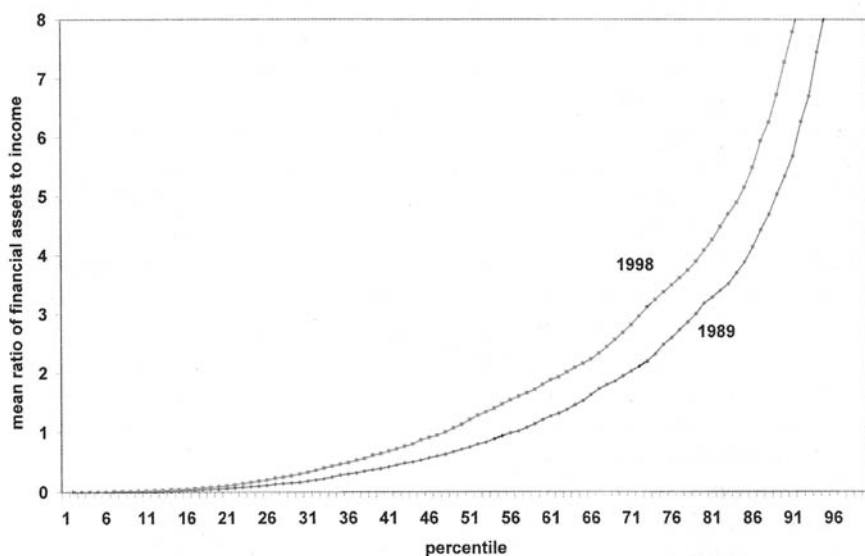


FIGURE 10.6a Ratio of Financial Assets to Income for Households Over Age 50, 1989 and 1988

population is noticeably better off in 1998 than in 1989—mostly as the result of capital gains. Of course, some of these gains were at least temporarily given back in the subsequent market downturn.¹³ Note also that about a fifth of the population (not necessarily the same persons over time) appear to have been unaffected by the behavior of the stock market. They saved little in 1989 and they save little in 1998, and account for little of aggregate personal saving in either year.

These “low savers” will be the principal focus of the remaining sections of this paper. However, before proceeding, we consider a few features of the “high savers” in Figures 10.5 and 10.6. As Hurst and Lusardi (2001) document, entrepreneurship is an important source of wealth for high savers. The proportion of entrepreneurs rises gradually as we move up the wealth distribution.¹⁴ While fewer than 10% of older households are (successful) entrepreneurs in the first two quintiles of the wealth distribution in the HRS, more than 80% of households are entrepreneurs in the top 3% of wealth distribution. Even though entrepreneurs are a very mixed group in terms of economic success, they account for a large share of wealth. Gentry and Hubbard (2001) and Hurst and Lusardi (2001) both report that entrepreneurs account for approximately 10 to 13% of the population but for close to 40% of total net worth. In the HRS, mean and median wealth holdings of the entrepreneurs are three to four times larger than non-entrepreneurs.

Why do entrepreneurs hold so much wealth? The fact that business families own more wealth has been interpreted as evidence of borrowing constraints: initial capital is needed to start a business and only those having enough wealth are in a position to start a business. There is an extensive literature that shows that wealth is associated with both being an entrepreneur and becoming an entrepreneur. Using different sources of data, Evans and Jovanovic (1989), Evans and Leighton (1989), Gentry and Hubbard (2001), and Holtz-Eakin, Joulfaian and Rosen (1994), among others, find that wealth (or proxies for wealth) constitute an important determinant of entrepreneurship.¹⁵ This finding is, however, controversial. First, a simple selection mechanism can be at work here so that only successful entrepreneurs survive and one only observes the upper tail of the distribution. Second, it is not obvious what wealth “measures.” It may proxy the presence of borrowing constraints or it may reflect special talents or abilities of entrepreneurs.

The reason why savings behavior of entrepreneurs and other very wealthy individuals is important is that unlike the vast majority of American households who save a relatively small portion of aggregate household saving, the savings behavior of entrepreneurs *does* matter for aggregate capital accumulation and the NIPA measure of aggregate saving. A better understanding of what motivates high-wealth households is

critical to a better understanding of inequality of wealth among older households, but is beyond the scope of this paper (see Kennickell & Lusardi, 2001).

Are Households Saving Too Little for Retirement?

A number of studies have attempted to determine what is an "adequate" level of saving and wealth accumulation given the presence of Social Security and pension funds.¹⁶ One approach is to compare actual wealth with the amount of wealth deemed necessary to smooth consumption at retirement (Warshawsky & Ameriks, 2000; Moore & Mitchell, 2000; Gustman & Steinmeier, 1999). Generally, these studies find that about half of the population will not be able to preserve consumption levels after retirement. Of course, the key assumption in the replacement rate analyses in both types of studies is that households wish to maintain consumption levels into retirement, a question about which little is known.¹⁷

A second approach is to test empirically the extent to which households suffer a decline in consumption at retirement. Most studies show a sharp drop, more than can be rationalized by explanations consistent with traditional models of saving, and/or extensions that take account of non-separabilities between expenditures, leisure, and work.¹⁸ Bernheim, Skinner, and Weinberg (2001), for example, find that even after instrumenting for endogenous retirement decisions, roughly one-third of retirees experienced a drop in consumption of more than 35 percentage points.

The Banks, Blundell, and Tanner (1998) study shows that when household heads turn age 65, there is an overall drop in consumption that is at least one percentage point larger than what can be attributed to other life cycle factors. This has been incorrectly interpreted by some observers (e.g., Engen, Gale, & Uccello, 1999) as suggesting that the decline in consumption during retirement is quite modest. The confusion arises because this one-percentage point decline is averaged over all households, including those who had already retired and those who have not yet retired. If the differential "spike" in retirement at age 65 is, say, an additional 5% of the population who choose to retire at age 65, then the implied decline in consumption for this group is a much larger 20 percentage points (i.e., one percentage point drop divided by the 5% of the population retiring at that age).¹⁹ If one further considers that households better prepared for retirement do not experience any drop in consumption at all (e.g., Bernheim, Skinner, & Weinberg, 2001), the implied decline in consumption for those less prepared is much larger.

There is other scattered evidence suggesting that households save too little and that resources may be inadequate to support a comfortable retirement or to deal with adverse circumstances. Venti and Wise (2001), and

Hurd and Zissimopoulos (2000) examine subjective information about past saving behavior. When asked to evaluate their saving, a stunning proportion of respondents (over 70%) report having saved too little over the past 20 and 30 years. Similarly, Lusardi (2000) documents that half of the people who did not plan for retirement experienced a non-satisfying retirement. Inadequacy of financial resources is particularly crucial to the welfare of women in retirement. Hurd and Wise (1989), and Weir and Willis (1998) have shown that many women are financially vulnerable in the event of death of their spouse. A husband's death is an important factor in causing the widow's entry into poverty.

Engen, Gale, and Uccello (1999), on the other hand, argue that the under-saving problem is not so serious. They develop a simulation model of rational economic agents responding to earnings shocks and determining optimal consumption levels. They demonstrate that, because of uninsurable earnings uncertainty, households can arrive at retirement with what appears to be "inadequate" wealth simply because of adverse earnings shocks. This is an important point; even rational agents may end up at retirement with low levels of wealth. However, as they acknowledge, they are not able to explain entirely the sizeable numbers of households who arrive at retirement with next to nothing in wealth.²⁰ Finally, there is some evidence that pension wealth levels are increasing over time (Poterba, Venti, & Wise, 2001; Wolff, this volume) suggesting a rosier future picture of financial security at least for some fraction of the population.

Why Do Households Save So Little? Rational or Economic Factors

Explanations for why some people appear to save too little can be grouped into two basic categories: rational reasons for saving little, and behavioral or psychological (but probably not rational) reasons. In line with the rationality approach, some have argued that what we deem "low wealth" households need not save much as they can expect generous relative retirement benefits, either from Social Security or from other pension plans (Huggett & Ventura, 2000; Gustman & Steinmeier 1999). As mentioned earlier, pensions have been one of the fastest growing components of total wealth. Focusing on non-pension wealth, particularly financial assets, is very limiting when looking at older households, as many of them have annuity wealth. As Gustman and Steinmeier (1999) report using data from the HRS, approximately 50% of total retirement wealth is accounted for by Social Security and pensions, and these two sources account for almost all wealth for the lowest quartile of households. Thus, many households with low "saving" have accumulated substantial wealth through pension and Social Security benefits. Moreover, while the distribution of private wealth

is very dispersed, the distribution of pension wealth and, particularly, Social Security wealth is much less unequal (McGarry & Davenport, 1998; Gustman & Steinmeier, 1999; Smith, 2001).

We should note, however, that many households do not have private pensions, and thus can rely only on Social Security and their private wealth at retirement.²¹ But for low-income workers, the replacement rate offered by Social Security alone can approach unity (in other words, the pension will be roughly equivalent to the individual's after-tax earnings) and that may partly explain why these households save so little and accumulate such little wealth. As it turns out, Social Security and pension wealth differences across income groups cannot entirely explain the low levels of saving among households in the bottom half of the income distribution. Dynan, Skinner, and Zeldes (2000) imputed Social Security and pension saving in a sample of households during the 1980s, and found that even within given age groups, lower income households accumulate at lower levels compared to higher income households after accounting for the implicit saving provided by Social Security and pension plans.

As noted above, Engen, Gale, and Uccello (1999) demonstrated that in simulation models with random earnings shocks, there will be wealth heterogeneity because some families will experience positive shocks, others negative shocks. This result reminds us that, in constructing a "null hypothesis" of rational agents, one should expect quite considerable variation in wealth to income ratios at retirement even in the absence of hyperbolic discounting or other non-rational behavior.

As mentioned earlier, wealth inequality is high in the United States and, in particular, wealth levels are strikingly low for poor households. Hurst and Ziliak (2001) report that over 90% of welfare recipients in 1994 and over 80% of pre-retired households with children who have less than a high school education have less than \$500 of accumulated non-pension liquid assets. For this segment of the population, low rates of saving may simply be a rational response to the presence of asset-based means tests in welfare programs. Among low-income households, the likelihood of turning to welfare programs (such as Medicaid, Supplemental Social Insurance, or cash welfare payment programs) is very high. The asset limitations for participation in these programs impose quite severe penalties to saving and accumulating wealth. Effectively, these programs tax wealth at a rate of 100% in the event of an income or health downturn; households are required to "spend down" assets to qualify for support. Thus households could optimally choose to saving little or nothing, even if in fact they never qualify for welfare *ex post* (see Hubbard, Skinner, & Zeldes, 1995).

There is some empirical research that suggests that these welfare programs may discourage saving and increase the inequality of asset holdings. Gruber and Yellowitz (1999) note that welfare recipients can be

legally prosecuted for holding assets above the legal limits, which vary from state to state and over time. They exploit this variation to estimate the effect of asset limits on saving. They find that asset-based means tested programs reduced measured wealth (and presumably saving) by 17% among lower income groups. Similarly, Powers (1998) finds a strong effect of assets limits: each one dollar rise in the asset limit raises savings of single female-headed households by 50 cents.

Why Do Households Save So Little? Behavioral Factors

A growing literature has focused on behavioral explanations for why some households fail to save. Some households may simply have difficulty recognizing the need to save and calculating the saving they need to do. For example, Lusardi (1999, 2000) used data from the HRS—in which respondents are only a few years away from retirement—and found that as many as 30% of respondents have not given any thought whatsoever to retirement plans.²² Most importantly, she found that the lack of planning leads to low levels of wealth accumulation, participation in retirement plans, and ownership of stocks. Some households may simply face high planning costs or lack financial literacy; they find planning for retirement too complicated and they do not know how to find help to do it (Bernheim, 1995; Yakoboski & Dickemper, 1997). There is also evidence that households are not well informed about their Social Security and pensions benefits, even when these are the major source of support for retirement. Gustman and Steinmeier (2000a) report that workers often do not know the types of pension they have (whether DB or DC) or the benefits associated with it. (See also the paper by Johnson et al., in this volume).

A related problem is that even households that make financial plans may not be able to carry them out. As a series of papers have suggested, people may display hyperbolic rather than exponential discount functions (see, Laibson, 1997; Laibson, Repetto, & Tobachman, 1998; O'Donoghue & Rabin, 1999a, 1999b). For hyperbolic agents, short-run discount rates are higher than long-term rates, so decision-making is time inconsistent. When combined with costs of planning, this gives rise to much inaction: people procrastinate making decisions that require immediate effort. More generally, many people suffer from self-control problems and thus fail to follow through on plans to save (see, for example Thaler & Shefrin, 1981; Akerlof, 1991).

As further evidence that workers have difficulties in devising saving and retirement plans, many employers have started offering financial education to their employees. As of 1994, the great majority of large firms (88%) offered some forms of financial education (Bernheim, 1998). Finan-

cial education is prevalent among firms offering DC pensions, where workers have to make their own decisions on how to allocate pension funds. A few studies have looked at the effects of financial education in the work-place on private savings or contributions to pension funds (see, among others, McCarthy & Turner, 1996; Bernheim, 1995, 1998; Bayer, Bernheim & Scholz, 1996; Bernheim & Garrett, 1999; Clark & Schieber, 1998; Madrian & Shea, 2001). The empirical findings are still mixed. There is evidence of some effects of financial education, but the form of education seems to matter. For example, Bernheim and Garrett (1999) and Bayer, Bernheim, and Scholz (1996) find that programs that rely on print media (newsletters, plan description, etc.) have generally no effects on participation or contributions to pensions. Similarly, retirement seminars are found to affect only certain aspects of behavior, for example participation in pension and the amount of contributions but not total savings (Bernheim & Garrett, 1996; McCarthy & Turner, 1996). In short, the behavioral approach to understanding why some households fail to save holds promise, but the causal links are still not entirely well understood.

DIRECTIONS FOR PUBLIC POLICY

If individuals have trouble saving because they lack information, or because of the dynamic inconsistencies suggested above, then there is some justification for government policies to encourage saving. For example, one problem is that low-income workers are simply less likely to be covered by employer-sponsored pension plans, which overcome many of the behavioral impediments to saving. (In theory, workers not covered under employer pension plans—where participation is often mandatory—could simply open IRA accounts and provide for their own retirement, but in practice, such behavior among low-income workers is rare.) In 1993 about 8% of workers with incomes less than \$10,000 and 35% of workers with incomes less than \$20,000 worked for an employer offering a pension. In contrast, over 80% of full-time workers earning more than \$50,000 are covered (United States Department of Labor, 1994).

Given coverage, participation in most DB and conventional DC plans is typically mandatory. However, if the worker is covered by a 401(k) plan, then participation is often voluntary. There is a substantial literature that suggests participation is sensitive to plan design and the level of information and support provided by employers (see Bernheim & Garrett, 1996; Clark & Schieber, 1998; Duflo & Saez, 2000; Madrian & Shea, 2001). Of course a key issue is whether retirement saving programs increase

saving. While this has been a matter of much debate (see Engen, Gale, & Scholz, 1996; Hubbard & Skinner, 1996 and Poterba, Venti & Wise, 1996), there is a consensus that pensions and 401(k)s, are effective at stimulating saving particularly among low-income households.²³ Furthermore, these pension plans entail relatively little revenue cost (Hubbard & Skinner, 1996), and in the presence of capital gains, could even raise revenue for the government (Dusseault & Skinner, 2000).

The controversies that erupted in 2002 surrounding the Enron bankruptcy and the evaporation of some employees' 401(k) plans that were heavily invested in company stock reinforces the importance of adequate pension regulation as well. In theory, adequate education should be enough to guard against employees placing all of their eggs in the company basket, but in practice, regulations placed on the allocation of employee (or employer) contributions could be critical in preventing these infrequent but severe adverse events.

Encouraging saving among the very poor elderly is complicated by the presence of means-tested welfare programs which discourage asset accumulation. Since this group saves little anyway, removing all asset-based means testing may increase wealth accumulation by these households at relatively little cost to the government. Another reason why many poorer households fail to save is that they lack experience and expertise in financial matters. Not only do these households not invest in stocks or retirement accounts, but they often do not even hold a bank account. As mentioned before, a growing number of employers have undertaken initiatives to promote financial literacy. The United States Department of Labor as well has launched a national pension education program aimed at "drawing the attention of American workers to the importance of taking personal responsibility for their retirement security." While these initiatives are important and document how widespread the problem of financial illiteracy is, it is not clear that the poor, especially the elderly poor, are effectively targeted by these initiatives.

Unfortunately, much of the financial "know-how" of poorer households is likely to be acquired at a more local level. For example, low-income families are likely to live in communities whose members also have low financial literacy or come from families of low financial literacy. Several recent studies have shown that family background plays an important role in affecting the amount and type of assets households own. People learn about financial matters from parents and siblings (Lusardi, 2000; Chiteji & Stafford, 1999). For women, in particular, parents and relatives seem to be the dominant source of financial information and advice. This channel may not be a viable or a desirable one for those households that come from poor and low saving families.

CONCLUSION AND DISCUSSION

This paper began with the observation that the measured personal saving rate has fallen close to zero. We find that capital gains in the stock market can explain much of the decline in the measured NIPA saving rate throughout the 1990s, through both behavioral and accounting channels. We concluded that the effect of the decline in the NIPA saving on the financial security of future and current retirees, is often overstated in the popular press. The NIPA saving rate is primarily a gauge of the supply of new funds for investment from the household sector, and not a measure of how well households are preparing for retirement. Other indicators of saving and financial preparedness provide a more optimistic outlook. After adjusting for "shortcomings" of the measured saving rate, the implications for retirement security during the 1990s seem much less worrisome: For most households over age 50, wealth relative to income appears to be rising, not declining, suggesting that most of the population appears to be better prepared in the 1990s than a decade earlier.

While the late 1990s run-up in the value of financial assets (including assets held in retirement accounts) has benefitted many households, the gains have not been shared equally. There remain segments of the population that continue to accumulate extremely little wealth. For some of these households Social Security may support the low level of consumption these households have grown accustomed to. However, evidence of a drop in consumption at retirement as well as *ex post* survey evidence that many households did not "save enough" suggests to us that many households did not fully appreciate the link between their saving behavior and the adequacy of consumption in the future. Why this is so is an open question that has become the focus of behavioral and psychological analyses of decision-making. One likely explanation is that many households are simply incapable of calculating how much they need to save to provide for their retirement, and thus the lack of necessary information results in inaction. There is also much recent evidence that even among those households able to formulate a saving plan, many may lack the self-control to carry it out (Laibson, 1997). The policy implications of behavioral models, however, can appear somewhat paternalistic, in that they seek to prevent one's consumption-oriented current self from tapping into assets that are planned for one's future self's retirement. Some approaches, such as making contributions to 401(k) plans a default option (rather than the converse), hold promise for increasing pension saving, although specifying the default option can also be a critical policy choice (Madrian & Shea, 2001). For example, a default 3 percentage point contribution rate to low-yield bonds may not serve the long-term retirement interests of

employees (Madrian & Shea, 2001), nor will large portfolio shares of company stock. Other approaches, such as a recent suggestion that entails workers to commit future earnings increases to 401(k) pension contributions, hold promise as well (Thaler & Benartzi, 2001).

One important topic not explored here is the link between wealth and income on the one hand and health on the other. Smith (1999) and others show there is a much stronger correlation between low wealth holdings and poor health than between low income and poor health. The issues of causality are particularly intriguing; whether the direction goes from wealth to health, or from health to wealth, and carries important implication for the well-being of the elderly population. If indeed adequate financial planning ensures not just financial health, but a reduction in stress and hence better biological health, then the issues surrounding saving for retirement and other contingencies assumes even greater importance.

Another message from this lengthy tour of the savings literature is that there is no single measure of saving that can address the myriad concerns regarding the adequacy of saving for retirement, the adequacy of national saving for national investment, or the ability of American families to keep ahead of their credit card payments. Instead, to get the kinds of answers one needs to address concerns over low saving and poor financial planning, one must increasingly turn away from the aggregate statistics and toward the detailed micro-level data sources such as the HRS and the SCF. While these data cannot inform us about patterns of aggregate saving flows, they can document the relative successes and failures of American families in attaining their goals of financial security during retirement.

NOTES

This paper draws heavily from a previous work titled: "Saving Puzzles and Saving Policies in the United States," published in the Spring 2001 issue of the *Oxford Review of Economic Policy*. We are grateful to the Oxford University Press for permission to use materials from this article, and would like to thank Marshall Reinsdorf and participants at the 2002 AEA meeting for many helpful comments. Skinner and Venti are grateful to the National Institute of Aging for funding support. Any errors are our responsibility.

1. The increased annuitization of retirement income may have secondary effects on saving; see Gokhale, Kotlikoff, and Sabelhaus (1996).
2. The BEA periodically undertakes a comprehensive revision of the NIPAs to incorporate methodological improvements. There have been eleven comprehensive revisions, with the two recent revisions having had relatively major effects on personal saving. In 2000 the BEA reclassified contributions to Federal Civil-

ian, Federal Military, and State and Local retirement plans as personal income (affording government pensions the same treatment as private pensions). This change raised personal saving, but decreased government saving by an offsetting amount.

3. This point has been raised and similar estimates have been provided by many authors including Summers and Carroll (1987), Bradford (1990), Gale and Sabelhaus (1999), and Peach and Steindel (2000). Other variations include adjustment for the treatment of home ownership, correcting for inflation-induced revaluation of nominal assets, and measuring the implicit tax liability in tax-advantaged assets. See Holloway (1989), Seskin and Parker (1998), Gale and Sabelhaus (1999), and Reinsdorf and Perozek (2000). See also the discussion of Judge (1989).

4. Also see Barberis, Huang, and Santos (2001).

5. Lettau and Ludvigson (2000) further note that aggregate studies do not distinguish between transitory and permanent components of the variation in asset wealth. According to their findings, a vast majority of variation in asset wealth is transitory and has no impact on consumer spending.

6. We use as a denominator disposable income of \$7031 billion in 2000. Strictly speaking, consumers should value the stock market gains on an after-tax basis, but since econometric estimates do not correct for tax liabilities, neither do we.

7. These capital gains are enormous relative to measured saving. In the boom year of 1995 there were \$229.4 billion of capital gains in DB plans, \$188.7 billion in DC plans, and \$208.9 billion in IRAs. By comparison, total NIPA saving in 1995 was \$302.4 billion.

8. The DC and DB contribution data used in these figures are from Form 5500 filings for private sector pensions for 1988-1997; the latest year data is available. DC contributions through 2000 are assumed to grow at 10.0% per year (the average for the three years preceding 1998 is 12.1%). DB contributions are assumed to remain at their 1997 level. The apparently anomalous increase in DB contributions in 1993 is the result of a one-time injection of \$15.3 billion by General Motors into its underfunded pension plan. IRA contributions include only tax-deductible contributions and ignore contributions from rollovers. The data on IRA contributions and distributions through 1999 are from the *IRS Statistics of Income*, with author's estimates for 2000. DB and DC investment earnings and distribution data through 1997 are from the Form 5500. Investment earnings are estimated to be 5.47% in 1998, 3.2% in 1999 and 0% in 2000. These are the rates of growth of imputed income for the entire pension sector in the NIPAs for 1998 and 1999 (2000 data are unavailable). DB and DC distributions are assumed to be 6.55% for 1998, 8.08% for 1999, and 7.81% for 2000. These are the rates of growth for all private sector retirement benefits in the NIPAs. IRA investment income data through 1998 are from Sabelhaus (2000). Data for 1999 and 2000 are authors' estimates.

9. The IRA flows also reflect the increasing importance of rollovers. Rollovers are most likely to occur among older persons with large pension accumulations who are separated from their jobs.

10. Here we follow the excellent analysis in Reinsdorf and Perozek (2000) with data updated to 1994 (personal communication); also see Poterba (2000).

11. Total wealth includes housing, retirement assets, business wealth, and financial. Lifetime earnings are calculated from Social Security earnings histories. These data are from the 1992 Health and Retirement Study which is the most recent survey containing pension wealth at the micro level. See Venti and Wise (1998, 2001) for detail. See also Smith (1995).
12. The figures are based on households with at least \$1,000 of annual income. The first percentile, which is negative in all cases, has been dropped from these figures.
13. Gale (1998) has argued that after-tax wealth should be considered in making comparisons over time. We also considered changes in the wealth distribution using after-tax DC wealth in both years (with an assumed tax rate of 27%), and found a smaller change but a very similar pattern. For example, the 1998–1989 difference in the 50th percentile was an increase of 0.42 in ratio of financial wealth to income without adjustment, and 0.38 with adjustment. One shortcoming of these data is that we do not know individual defined benefit (DB) wealth. However, since FFA data show that the ratio of DB assets to disposable income increased from 23% in 1989 to 31% in 1998, we would expect an even wider difference in the wealth distribution including DB plan wealth.
14. The definition of entrepreneurs differs across studies. In some case, it is used to mean self-employed, in some others business owners or both. We use the word interchangeably.
15. See Hurst and Lusardi (2001) for a detailed discussion of this literature.
16. For an earlier debate on this question, see Congressional Budget Office (1993) and Bernheim (1993, 1995).
17. One reason why many of these studies, including those referenced in the above footnote, arrive at different conclusions is that they make a variety of assumptions about the use of housing wealth to finance consumption in retirement.
18. See Hamermesh (1984), Mariger (1987), Hausman and Paquette (1987), and especially Banks, Blundell, and Tanner (1998) and Bernheim, Skinner, and Weinberg (2001).
19. The implicit assumption here is that turning age 65 does not by itself exert an influence on consumption; that is, that people who retired at age 62 do not arrive at their 65th birthday and suddenly decide to consume less than they had previously.
20. As well, Engen, Gale, and Uccello (1999) argue that other studies have overstated the degree of “undersaving” for retirement. However, some of these arguments were based on a flawed interpretation of existing studies; see the discussion of the Banks, Blundell, and Tanner (1998) study above; also see footnote 27 in Bernheim, Skinner, and Weinberg (2001).
21. Households without pensions are not necessarily poor. Some of them, particularly those who are self-employed and own their own business, are quite wealthy.
22. In the conventional life cycle model, rational individuals make optimal consumption and saving plans starting at time 0. See also Yakoboski and Dickemper (1997).
23. Results from Gustman and Steinmeier (1999) suggests pension saving lead to higher overall saving, on the other hand see Gale (1998). Engen and Gale (2000) suggest that 401(k) balances are largely new saving among lower income households.

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CHAPTER 11

The Economic Future of the Baby Boom Generation

RICHARD W. JOHNSON
THE URBAN INSTITUTE

STEPHEN CRYSTAL
DIVISION ON AGING, INSTITUTE FOR HEALTH,
HEALTH CARE POLICY, AND AGING RESEARCH
RUTGERS UNIVERSITY

There has been much debate over the later-life economic prospects of the post-World War II “baby boom” cohorts, born in the years following 1945. Among the many economically distinctive aspects of this cohort’s experience is the fact that in their early working years, they were affected by an extended period of stagnation in wages, especially for less-skilled positions, which began in the early 1970s (Levy & Murnane, 1992). The cohorts immediately preceding the baby boomers experienced rising wages in at least the earlier years of their careers, during the extended postwar economic expansion that lasted through the 1960s. Many benefited from expanding opportunities for stable career employment in large industries, often unionized; private pension systems initiated during and after the war were expanding; and it was a relatively routine expectation to do better economically than one’s parents. In contrast, many observers noted the more unsettled labor market conditions experienced in the period following 1970, marked by overall wage stagnation and the increasing wage disadvantage experienced by workers with little formal education relative to the well-educated (Blackburn, Bloom, & Freeman, 1990; Karoly 1993; Levy & Murnane, 1992). This caused some observers to express considerable pessimism over the retirement income prospects of the baby boom cohorts, given an apparent extended setback in their income trajectories during their early working years relative to the experience of the preceding cohort.

It is not clear, however, what the implications of these factors are for the future economic well-being of the baby-boomers, or what have been the differences in the experience of those on the boom's leading edge versus those born later. On one hand, social changes such as increasing labor force participation by married women may have buffered the impact of wage rate stagnation on family economic well-being. On the other hand, it is clear that retirement income prospects are heavily influenced by trends in the labor market. Social Security benefits, which are the principal component of retirement income, depend on lifetime earnings. Private pension benefits are available to some retirees, but generally only to individuals in the best-paying jobs (Crystal, 1984; Johnson, 1996). High-wage workers are better able to save before retirement, enabling them to accumulate assets to finance consumption during retirement. Workers with employer-sponsored health insurance coverage experience lower levels of out-of-pocket medical expenses and better health care than workers with no health benefits, which may lead in turn to better health, higher productivity, and higher wages. Employer-sponsored retiree health benefits, earned during the working years, offer protection against catastrophic medical expenses (and subsequent depletion of assets) by supplementing Medicare coverage after age 65 or by providing basic health insurance coverage before Medicare eligibility begins. Thus, employment and earnings histories are the major determinant of economic status after retirement.¹

The oldest of the baby boomers will not reach age 65 until the year 2011. Consequently, the economic outcomes they will experience in retirement cannot be predicted with any certainty, since they will be affected by events that are yet to unfold. However, as baby boomers move through their middle years, it is increasingly possible to examine the income trajectories experienced by these cohorts to date, and to compare their economic status to that experienced by earlier cohorts at the same age. To the extent that earnings trajectories over the life cycle take the same general form over the next several decades that they have in the past, such comparisons are prognostic of a cohort's economic future, with predictive value which increases as the cohorts move closer to retirement age.

In the early 1990s, several studies followed income trajectories of older baby boomers through the late 1980s and compared them with the income trajectories experienced by their parents' generation at similar ages. Measurement and analytic choices make a considerable difference in the results of such comparisons. Levy & Michel (1991) used data on incomes of men to estimate that baby boomers experienced a 9% to 18% advantage over their parents at ages 25–34. Taking account of income both of men and women using cross-sectional data from the Current Population Survey (CPS), and using an "income per adult equivalent" (IAE) measure to account for differences in household size, Easterlin, Shaeffer, &

Macunovich (1993) found that in 1989, at ages 35–44, the leading-edge baby boomer cohort born between 1946 and 1955 had an IAE 73% greater than those of that age in 1964, 25 years earlier. Similarly, the Congressional Budget Office (1993) used CPS data for 1989 and 1959 to estimate that at ages 35–44, leading-edge boomers had an 82% advantage over their parents' generation in median household income adjusted for household size (see also Sabelhaus & Manchester, 1995).

While the improvements reported by these CPS-based studies clearly reflect in large part the increasing earnings of married women, these studies utilized cross-sectional data on total household income and did not disaggregate the contribution of husband's earnings, wife's earnings, and other income sources to family income for baby boomer and pre-boomer cohorts. Such disaggregation is important in understanding the economic circumstances of baby boomer cohorts and the changing patterns of family economic behavior that drives these outcomes. Further, since labor market changes have not affected all subgroups equally, it is important to move beyond the emphasis on measures of average income to examine more closely the experience of particular subgroups. Since income differences by educational attainment have grown rapidly in the last two decades, it is particularly important to understand the experience of those with varying levels of formal education. Given the already high level of economic inequality within the elderly population in the United States (Crystal & Shea, 1990a; Crystal & Waehrer, 1996), it is also important to examine the degree of inequality experienced by baby boomer cohorts in comparison to those experienced by earlier cohorts at similar ages, and to examine the prevalence of severe economic disadvantage across cohorts.

Income mobility is another dimension by which baby boomers may differ from earlier generations. Wage stagnation in recent years may have reduced the opportunities for those in the lower end of the income distribution to substantially improve their relative position over time, strengthening the link between adverse life circumstances early in the lifecourse and economic disadvantage in later life. Income mobility can only be traced with longitudinal data. Finally, since the link between earnings and retirement income depends in part on pension coverage, and there has been considerable concern about stagnation or slippage in such coverage, it is important to examine the pension-coverage experience of baby boomer cohorts.

In the present study, we utilize longitudinal data from two national surveys to examine these issues, comparing income trajectories for families from the post-World War II baby boom birth cohorts with families from several earlier cohorts. We are able to follow the earliest baby boomers into early midlife (ages 45–49), and explore the contribution of husbands' and wives' earnings to the family income of married respondents. We also look separately at the experience of respondents by race and at various levels of

formal education, compare the levels of inequality and income mobility within the baby boomer and pre-boomer cohorts at similar ages, and contrast pension coverage across cohorts both for men and for women. Our analyses followed the income trajectories of these cohorts only into the early 1990s, but nevertheless provide enlightening comparisons of the economic experience of baby boomers during a critical period of their life-course—coinciding with the wage stagnation of the 1970s and 1980s—as compared with the trajectories experienced by preceding cohorts. Generally, our results suggest that the economic experience of the baby boomers during their early work lives compared fairly favorably to that of the immediately preceding cohorts—with important caveats that we discuss. Although a number of years remain for economic developments to continue to shape, in ways that are not entirely predictable, the retirement prospects of the baby boom cohorts, further analyses with more recent data can contribute an increasingly clear picture of the trajectory these cohorts are experiencing.

DATA

National Longitudinal Surveys

Our study relies primarily on information from two companion data sets: the National Longitudinal Survey of Mature Women (NLSMW) and the National Longitudinal Survey of Young Women (NLSYW). Designed by the Center for Human Resources Research at Ohio State University for the U.S. Department of Labor, these surveys were initiated in the mid-1960s and continue to gather information on respondents through the 1990s. Data were collected on a wide variety of topics, including age, race, education, household composition, health, marital history, employment history, income, assets, and family background. These surveys, each of which provide information on a large sample of families and individuals of similar age who were followed for many years, offer an unusually rich opportunity to compare economic outcomes over the lifecourse for different cohorts of women and their families.

NLSMW surveyed 5,083 women in 1967 born between 1923 and 1937, and NLSYW surveyed 5,159 women in 1968 born between 1944 and 1954. Each of the two surveys was drawn from a multi-stage probability sample designed to represent the civilian noninstitutionalized population of the United States for women of the specified ages and their households, with a large oversample of blacks. Both surveys continue to re-interview respondents periodically, at approximately two-year intervals. Because they follow women over time, the surveys do not provide information on single men, although information on the husbands of married women is available.²

To compare income trajectories for women born in different years, we divide respondents in each survey into five-year birth cohorts. Table 11.1 summarizes basic demographic characteristics for each cohort. The oldest cohort, denoted Cohort 1, was tracked from ages 40–44 in 1967 to ages 65–69 in 1992. The next two cohorts—Cohort 2 and Cohort 3—were also followed for 25 years, from ages 35–39 and 30–34 in 1967 to ages 60–64 and 55–59 in 1992. The period of observation is shorter for the two younger cohorts of NLSYW, since we restrict our sample to respondents at least 25

TABLE 11.1 Description of Sample

	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Cohort 5
Year of Birth	1923–27	1928–32	1933–37	1944–48	1949–53
Number of Cases					
at initial observation	1836	1598	1360	1811	1984
at final observation	994	959	846	1382	1729
Age Range					
at initial observation	40–44	35–39	30–34	25–29	25–29
at final observation	65–69	60–64	55–59	43–47	38–42
Race					
White ¹	71.9	70.0	71.5	74.8	69.5
Black or other race ¹	28.1	30.0	28.5	25.2	30.5
Educational Attainment					
Did not complete high school ¹	50.8	43.9	41.0	23.7	20.2
High school graduate only ¹	34.2	39.0	41.5	44.7	42.0
Some college ¹	8.2	9.6	9.4	15.8	17.6
Completed four or more years of college ¹	6.8	7.5	8.2	15.7	20.2
Marital Status					
Currently married ¹	79.7	80.5	79.6	73.8	64.3
Widowed or divorced ¹	15.6	14.1	13.0	13.0	15.0
Never married ¹	4.7	5.4	7.4	13.2	20.7
Currently married at ages 40–45	79.6	77.3	73.5	66.6	65.5
Mean Family Size ²					
at initial observation	4.4	5.1	4.9	3.8	3.4
	(2.19)	(2.28)	(2.10)	(1.68)	(1.66)
at final observation	2.0	2.2	2.4	3.1	3.4
	(1.09)	(1.14)	(1.29)	(1.47)	(1.49)
at ages 40–45	4.4	4.7	4.4	3.4	3.4
	(2.19)	(2.25)	(2.06)	(1.51)	(1.49)

Notes: 1. Cell entries indicate percentage of sample at time of initial observation.

2. Standard deviations are in parentheses.

years of age, by which time most individuals have completed their education and have established financial independence from their parents. We track Cohort 4 for 18 years, as they aged from 25–29 in 1973 to ages 43–47 in 1991, and Cohort 5 for 13 years, from ages 25–29 (in 1978) to 38–42.

As reported in Table 11.1, marriage rates and family size have declined over time, while educational attainment has increased. Among women at ages 40–45, when respondents in all cohorts were observed, 80% of those in the earliest cohort were married, compared to only 66% of those in the most recent cohort. At the same ages, mean family size was only 3.4 for the two most recent cohorts, compared with 4.7 for members of Cohort 2 and 4.4 for members of Cohorts 1 and 3. In addition, educational attainment of women has increased steadily over time. In the oldest cohort, for example, 51% of women did not complete high school, whereas only 20% of women in the most recent cohort did not complete high school. At the same time, the percentage of women graduating from college has steadily increased; 20% of women in the most recent cohort completed four or more years of college, compared to only 7% of women in Cohort 1. These demographic changes have important effects on the economic trends that we explore below.

Our primary analytic measure is family income. In both the NLSMW and the NLSYW, detailed information on income (received during the previous 12 months) is available for each survey year. In particular, data were collected on wage and salary income, self-employment income, private pension income, Social Security non-disability income, Social Security disability benefits, other disability benefits, unemployment insurance benefits, veteran's compensation, and Workman's Compensation, for both the respondent and her husband. Rental income, interest and dividends, farm income, welfare benefits, and other family income are also available each year at the household level. We compute total family income for each respondent by summing these components, and we express the amounts in real 1990 dollars by adjusting for changes in the Consumer Price Index. We impute missing income items using a hotdeck procedure, in which an observation with missing data for a particular item is assigned the value of the item from a randomly selected observation with valid data in the same race, education, and marital status group.³

To compute a meaningful measure of economic status, we adjust family income for the number of individuals who share it. We divide real family income by the Orshansky scale, defined as the ratio of the official poverty level for a given household's size to the official poverty level for a one-person household. This measure of adjusted family income can be thought of as real per capita income augmented to reflect economics of scale in household production. For example, two-person households do not need twice as many kitchens, refrigerators, or square feet as one-person households.

Current Population Survey

In order to investigate trends in pension coverage over time, we also analyze data from the March Annual Demographic File of the Current Population Survey (CPS).⁴ The CPS, conducted by the U.S. Bureau of the Census, collects information from 50,000 to 60,000 households each month. Since 1980, the March survey has included questions about pension coverage. The survey asks respondents whether their employers or unions offer pensions or other types of retirement plans to their workers, and if so, whether the respondents are included in the plan.

METHODS

The analytic strategy that we employ to investigate changes over time in the retirement prospects of women and their husbands is to construct trajectories of different measures of economic outcomes and compare these trajectories across different cohorts of women. Since we have divided our data into five-year cohorts, we can compare economic outcomes for women in different cohorts at the same age by computing measures of economic outcomes at five-year intervals. We use income data from 1967, 1972, 1977, 1982, 1987, and 1992 in the NLSMW (for cohorts 1, 2, and 3), and income data from 1973, 1978, 1983, 1988, and 1991 for the NLSYW (for cohorts 4 and 5).

We estimate trajectories for a number of different measures of economic status, using appropriate sample weights to adjust for the oversampling of low-income individuals. In order to evaluate changes over time in overall economic status for each cohort, we construct trajectories of mean adjusted family income. We also examine changes in the components of family income. In particular, we estimate trajectories of mean labor earnings separately for respondents and their husbands to assess the impact of increasing labor force participation rates of women on family income. Since this exercise is designed to measure changes in the level of compensation respondents and their husbands receive in the labor market, not the adequacy of labor market compensation for meeting consumption needs, we do not adjust earnings for differences in family size.

Although estimates of mean family income over time can provide valuable information about changes in economic well-being on average, they do not indicate how the distribution of economic outcomes has changed over time. Economic changes that result in higher overall income but lower income for certain groups have different policy implications than changes that result in higher income for all groups. We assess changes in the distribution of income in a number of different ways. We first compare

economic outcomes by race and education. We then compute Gini coefficients for each cohort over time. Gini coefficients, which provide a measure of the extent to which the distribution of income deviates from perfect equality, are derived from Lorenz curves. When respondents are arranged in ascending order of income, the Lorenz curve plots the cumulative percentage of income recipients on the horizontal axis against the cumulative percentage of income received on the vertical axis. The Gini coefficient is calculated as twice the area between the Lorenz curve and the 45-degree line. Thus, the Gini coefficient ranges from zero, denoting perfect equality, to one, denoting perfect inequality (all income is received by exactly one respondent). We also estimate the fraction of respondents with adjusted family income below 125% of the official poverty line, defined by family size each year, to determine how the proportion of the population with very low income varies over time and by cohort.⁵

Because wage stagnation during the last twenty-five years may have reduced the ability of persons who began life near the bottom of the income distribution to improve their relative economic position over the lifecourse, we also explore cohort differences in income mobility. For each cohort and each observed five-year age grouping, we divide the sample into income quintiles, on the basis of adjusted family income. We then compute the proportion of respondents who moved into the top two quintiles from the bottom two quintiles five years earlier and the proportion who fell into the bottom two quintiles from the top two quintiles five years earlier. We perform chi-square tests to determine whether the proportion whose relative economic position changed during the previous five-year period differs significantly by cohort. We also pool observations across all cohorts and observations and estimate logit models of income mobility, controlling for cohort and age. In our first logit model, the sample is restricted to women in the bottom two quintiles of the income distribution, and the dichotomous dependent variable is set equal to one if the respondent moves into the top two quintiles of the income distribution five years later (zero otherwise). In the second model, the sample is restricted to women in the top two quintiles of the distribution, and the dependent variable indicates whether the respondent falls into the bottom two quintiles five years later. The regressors include an intercept term and a series of dummy variables indicating cohort (with Cohort 1 as the reference category) and age group (with ages 55 to 59 as the reference category).

Finally, we explore changes in the availability of retirement benefits over time by constructing age profiles of pension plan participation for different cohorts of men and women in the CPS. We divide the CPS respondents into birth cohorts corresponding to the sampling frame of the NLS surveys: 1923–27, 1928–32, 1933–37, 1938–43, 1944–48, and 1949–53.⁶ For each cohort, we estimate at five-year intervals the proportion of men and women cur-

rently participating in pension plans sponsored by their employers or unions. Because the CPS includes information on all members of a given household, we are also able to determine the fraction of households in which at least one member currently participates in a pension plan. For consistency with the analyses based on the NLSMW and NLSYW, we define the cohort and age of a household by the date of birth of the oldest female member of the household between the ages of 25 and 64. Households that do not include any women are excluded. Since pension data in the Annual Demographic Files of the CPS are only available between 1980 and 1995, we have at most four pension observations, five years apart, for each cohort.

RESULTS

Changes in Overall Mean Income

Figure 11.1 plots mean adjusted family income by age for all women in each of the five birth cohorts. Family income adjusted for family size is substantially higher for women in the two cohorts born after World War II than for women in the three cohorts born before World War II. For example, between the ages of 40 and 44, when women in all cohorts are observed and none are observed in the deep recession years of 1980-82 (which can result in misleading cross-cohort comparisons), mean adjusted family income in 1990 current dollars was \$29,622 for respondents in Cohort 5 and

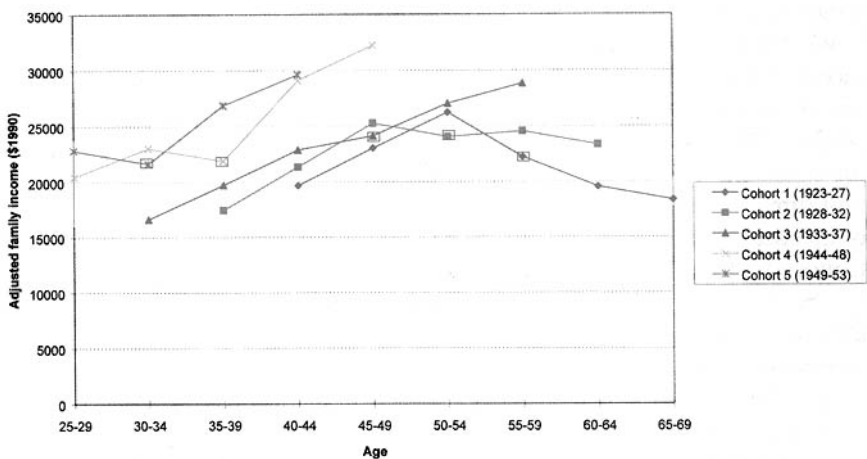


FIGURE 11.1 Mean Adjusted Family Income by Age and Cohort

Source: NLSMW and NLSYW

Note: Boxed observations denote recession of 1980-82.

\$29,100 for respondents in Cohort 4, compared with \$22,889, \$21,349, and \$19,671 for respondents in Cohorts 3, 2, and 1. Thus, Cohort 5 experienced a 51% improvement over Cohort 1. Each of the inter-cohort differences in adjusted income are statistically significant ($p < .05$), except for the difference in income between Cohorts 4 and 5. Respondents in Cohort 4, which includes the first wave of the baby boomers, received adjusted annual family income of \$32,223 in their late forties, 40% more than women born twenty years earlier (in Cohort 2) received at the same age.

Our estimates of differences in economic outcomes across cohorts do not appear to be biased upwards by selective sample attrition. The difference across cohorts in mean adjusted family income actually increases somewhat when the analysis is restricted to respondents who remain in the sample through the final wave of interviews. For example, at ages 40–44 mean adjusted family income in the restricted sample was \$29,774 for cohort 5 and \$19,042 for cohort 1.

The trajectories plotted in Figure 11.1 suggest that recent cohorts of women experienced slower growth in income over the lifecourse than earlier cohorts. For example, between the ages of 30–34 and 45–49, mean adjusted family income increased 45% for Cohort 3, but only 40% for Cohort 4.⁷ Moreover, the choice of ages 45–49 as the endpoint for the comparison understates the growth in income for Cohort 3, because income at ages 45–49 for members of Cohort 3 was measured in 1982, during the 1980–82 recession, whereas income for members of Cohort 4 was measured nine years after the recession. The effect of the recession on Cohort 3 income becomes apparent by comparison with Cohort 2; mean income for Cohort 3 exceeded mean income for Cohort 2 at every observed age range except ages 45–49. If we conservatively assume that in the absence of the recession mean income for Cohort 3 would have equaled mean income for Cohort 2 at ages 45–49, then our estimate of the income growth rate for Cohort 3 from ages 30–34 to 45–49 increases to 52%. The advantage in adjusted family income for cohorts born after World War II relative to those born before the war will diminish with age if later cohorts continue to experience slower rates of income growth. However, mean adjusted family income for members of Cohort 4 would have to fall by 11% between the ages of 45–49 and 55–59 for the advantage in income they enjoy over members of Cohort 3 to disappear by age 60, when many families begin to retire. Barring a major recession, a drop in income of this magnitude is unlikely.

The increase in adjusted family income for recent cohorts of women appears to result primarily from increases in the earnings of married women and from reductions in average family size. At ages 40 to 44, the percentage of married women with positive earnings increased steadily with each cohort, rising from 49% in Cohort 1 to 80% in Cohort 5. Differences in rates of labor force participation are particularly dramatic between

married women born immediately before World War II and married women born immediately after the war. At ages 40 to 44, 74% of married women in Cohort 4 worked outside of the home, compared to only 57% of women in Cohort 3, who were born ten years earlier. In order to assess the effect of women's increasing earnings on family income, we plot in Figure 11.2 the ratio of the mean earnings of wives to the mean earnings of husbands by age and cohort, for all married respondents. At every observed age, the ratio of wife's earnings to husband's earnings is substantially greater for Cohort 5 than for Cohort 4, which in turn is substantially greater than the ratio for any of the three earlier cohorts. For example, at ages 40 to 44, mean earnings of married women in Cohort 3 equaled only 25% of the earnings of their husbands, but the earnings ratio increased to 39% in Cohort 4 and to 48% in Cohort 5. Thus, although married women in their early forties born between five and 10 years after World War II earned only half as much as their husbands, their earnings were still twice as high, relative to husband's earnings, as the earnings of married women of the same age born 15 years earlier.

The increasing earnings of women are only partly due to higher rates of labor force participation by women, since the ratio of the mean earnings of wives to husbands also increases substantially over time when the sample is restricted to persons with positive earnings. For example, among employed wives and employed husbands at ages 40 to 44, the earnings ratio increases from 35% in Cohort 3 to 44% in Cohort 4 and to 51% in Cohort 5. In other words, from Cohort 3 to Cohort 5, the ratio of earnings

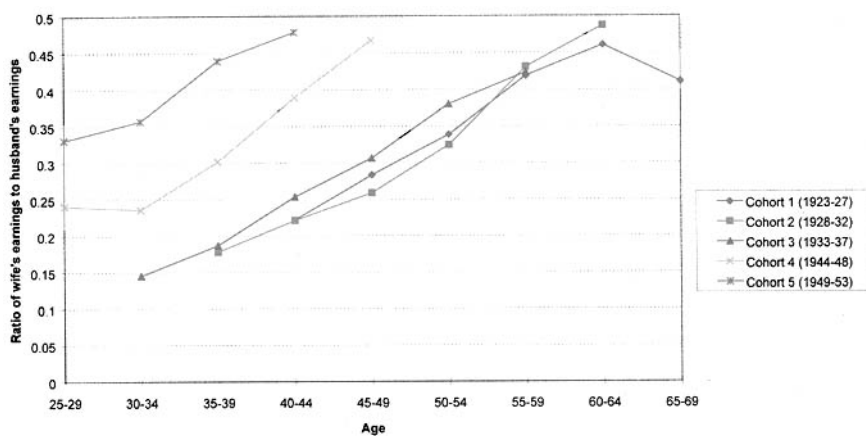


FIGURE 11.2 Ratio of Mean Earnings of Wives to Mean Earnings of Husbands

Source: NLSMW and NLSYW

Note: Sample restricted to married women and their husbands

of wives to husbands at ages 40 to 44 increased 92% for all married couples and 46% for couples in which both partners worked. The increase in the relative earnings of employed married women is attributable to higher relative wages and greater hours of work for women in the labor force. Note also that within each cohort, the ratio of wife's earnings to husband's earnings rose steadily over the lifecourse, as women increasingly entered the labor force and worked longer hours as they aged and the demands of childrearing diminished.

The other important source of the rise in adjusted family income over time is the decrease in family size. Figure 11.3 plots mean real family income by age for each cohort, without adjusting for differences in family size. At all observed ages, improvement in income across cohorts is substantially smaller when measured in terms of unadjusted family income than when measured in terms of adjusted family income. In addition, slopes of the unadjusted income trajectories for the earlier cohorts are smaller than slopes of the adjusted income trajectories, indicating that much of the longitudinal increase in adjusted family income for older cohorts can be attributed to decreases in family size as adult children leave home.

To investigate generational differences in economic status in more detail, we compare income by source within a given age range for two cohorts of women born 25 years apart. Table 11.2 reports the composition of family income for women in Cohort 1 and Cohort 5 in the 40–44 age range, separately for married women and single women. Among married

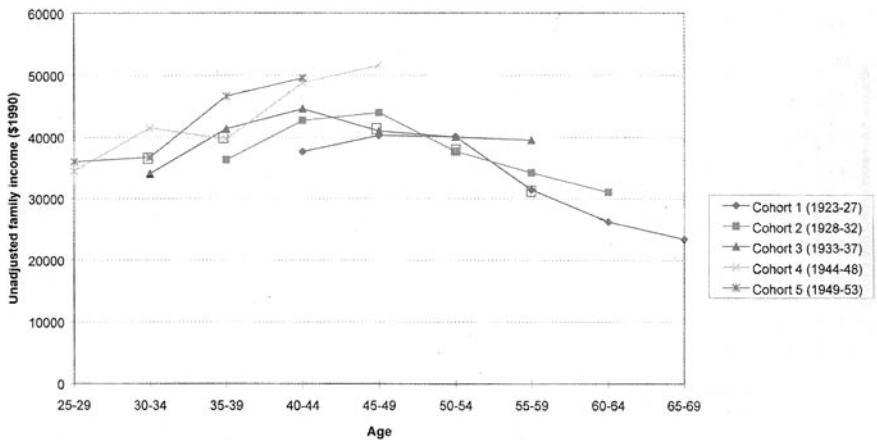


FIGURE 11.3 Mean Unadjusted Family Income by Age and Cohort

Source: NLSMW and NLSYW

Note: Boxed observations denote recession of 1980–82.

women, mean real earnings of husbands were only 18% greater in Cohort 5 than in Cohort 1. In contrast, mean real labor earnings of married women themselves were 153% greater for Cohort 5 than for members of their mothers' generation. Most of the increase in the earnings of married women appears to result from rising labor force participation rates of married women over the past 25 years. When the analysis restricts the inter-cohort comparison to married women with positive earnings, members of Cohort 5 earned only 54% more than those in Cohort 1. (Nonetheless, the growth rate in earnings for married women is markedly higher than the growth rate observed for married men during the same period, and may reflect an increase in the proportion of employed married women who work full-time instead of part-time, as well as an increase in the relative wages of women.) Other family income, which includes the earnings of other family members in the household, income from investments, and transfer payments, increased 44% in constant dollars for married women over the period. Total family income among married women was 44% higher for Cohort 5 than Cohort 1, but the drop in average family

TABLE 11.2. Changes in the Composition of Family Income at Ages 40–44 in Cohorts 1 and 5

	Cohort 1	Cohort 5	Percent increase from Cohort 1 to 5	Contribution to overall increase in Adjusted Family Income
<i>A. Married Women</i>				
Husband's Earnings	26933	31664	17.6%	20.6%
Wife's Earnings	5976	15146	153.4%	39.9%
Other Income	7947	12151	52.9%	18.3%
Total Family Income	40856	58960	44.3%	78.7%
Family Size	4.5	3.8	-15.6%	21.3%
Adjusted Family Income	20769	33116	59.4%	100.0%
<i>B. Single Women</i>				
Woman's Earnings	11631	18973	63.1%	70.3%
Other Income	8815	8810	-0.1%	0.0%
Total Family Income	20446	27783	35.9%	70.3%
Family Size	3.2	2.4	-25.0%	29.7%
Adjusted Family Income	13700	21484	56.8%	100.0%

Notes: There are 1481 married women and 355 single women in Cohort 1 observed at ages 40–44 (in 1967) and 1138 married women and 591 single women in Cohort 5 observed at ages 40–44 (in 1991). Entries in the first two columns are mean amounts. All dollar amounts are expressed in constant 1990 dollars.

size raised adjusted family income by 59% relative to the previous generation. The observed increase in economic well-being was quite similar for single women at ages 40 to 44, for whom adjusted family income rose 57% from Cohort 1 to Cohort 5. Earnings rose less sharply for single women than married women, primarily because rates of labor force participation rose much less sharply for single women than for married women.

The last column of Table 11.2 indicates the contribution of each component of income to the overall increase in adjusted family income between the two cohorts. If total (unadjusted) family income among married women did not increase over time, so that mean family income of Cohort 5 were equal to the level observed for Cohort 1, but family size assumed the actual distribution observed in Cohort 5, then mean adjusted family income for Cohort 5 would be \$2,632 greater than the mean level for Cohort 1. In other words, 21% of the estimated improvement in economic status for married women can be attributed to the decrease in family size, which reduced consumption needs. The remaining 79% of the improvement for married women arises from changes in family income. The increase in married women's earnings accounts for 40% of the rise in adjusted family income, while higher earnings by husbands account for only 21% of the increase for married couples. Thus, without the dramatic social changes of the past 25 years, which reduced family size and increased labor supply for married women, the economic well-being of married baby boomers would have improved little relative to the economic status of their parents. For single women, 70% of the improvement in economic well-being is attributable to higher labor earnings and 30% is attributable to reductions in average family size.

Racial and Educational Differences in Income Trajectories

To assess how the economic fortunes of different socioeconomic groups have changed over time, we also investigate income trajectories within racial and educational groups. Adjusted family income is generally between 1.5 and 2.0 times as high for white women as for black women. (The ratio reaches a high of 2.2 at ages 55 to 59 in Cohort 3 and falls to a low of 1.4 at ages 50 to 54 for Cohort 1.) No clear trend emerges in white-black income differences over time. Racial differences in income are somewhat muted in the oldest and youngest cohorts (Cohorts 1 and 5), and are relatively pronounced in Cohorts 2, 3, and 4. Thus we find no evidence that income disparities by race are different for baby boomer families than for previous generations.

Figure 11.4 plots for each cohort, by age, the ratio of mean adjusted family income of women who completed four or more years of college to mean

adjusted family income of women who did not complete four years of high school. The observed college premium, relative to not having completed high school, is higher for more recent cohorts of women than for cohorts born before World War II, at least through age 50. For example, at ages 40 to 44, women in cohort 4 who completed college received 2.5 times the adjusted family income received by women who did not graduate from high school. For women in Cohort 1, by contrast, the ratio was only 1.7, suggesting that a disproportionate share of the overall improvement in economic status over time is received by families with high educational attainment. Moreover, the college premium increased sharply with age after age 50 within each of the earlier cohorts, with the age gradient in the college premium increasing most sharply for Cohort 3 (the most recent cohort observed after age 50). Among women in Cohort 3, for example, the income ratio of college graduates to high school dropouts increased from 1.88 between the ages of 45 and 49 to 3.21 between the ages of 55 and 59. Although changes in adjusted family income may reflect changes over time in family size, the observed increase in the college premium after age 50 does not appear to be driven by the homeleaving patterns of children. The ratio of mean unadjusted family income of college graduates to high school dropouts, which is not affected by changes in family size, also increases sharply after age 50. Increases in the college premium with age support the cumulative advantage/cumulative disadvantage hypothesis that some of the effects of early head starts and handicaps cumulate over the life span, resulting in greater income differentials across socioeconomic class as cohorts age (Crystal & Shea, 1990a, 1990b).

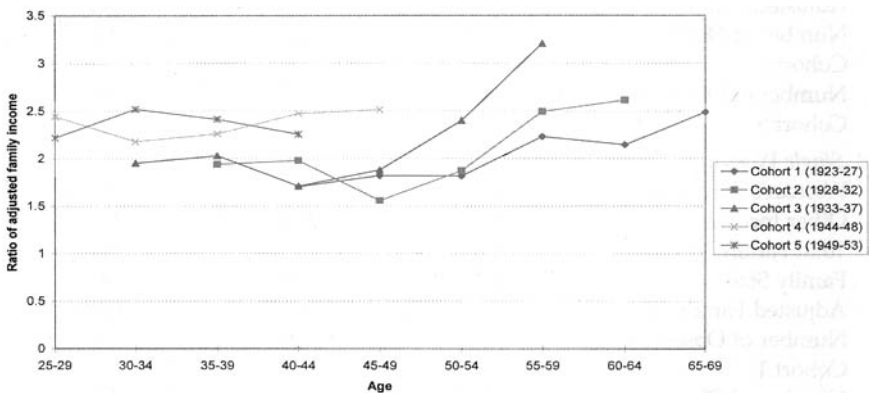


FIGURE 11.4 Ratio of Mean Adjusted Family Income of Women Who Completed College to Women Who Did Not Complete High School

Source: NLSMW and NLSYW

Table 11.3 reports cohort differences in adjusted family income within different educational groups, broken down by changes in husband's earnings, woman's earnings, other income, and family size. As in Table 11.2, we compare levels of different types of income for women ages 40 to 44 in Cohort 1 with women in the same age range in Cohort 5 (who were born one generation later), separately for married women and single women. Income levels are reported separately for women who did not complete high school, completed high school but did not attend college, and completed four or more years of college.

Among married women, differences in income between Cohort 1 and Cohort 5 increased steadily with the level of educational attainment. Mean adjusted family income increased for married women in Cohort 5 relative

TABLE 11.3. Percent Increase from Cohort 1 to Cohort 5 in Components of Family Income at Ages 40–44, by Education and Marital Status

	Women Who Did Not Complete High School	Women Who Completed Four Years of High School Only	Women Who Completed Four or More Years of College
<i>A. Married Women</i>			
Husband's Earnings	-17.3%	-0.8%	9.5%
Wife's Earnings	58.7%	106.1%	89.2%
Other Income	79.9%	36.8%	22.1%
Total Family Income	12.6%	21.1%	27.0%
Family Size	-18.0%	-14.5%	-18.5%
Adjusted Family Income	24.1%	33.5%	48.5%
Number of Observations, Cohort 1	639	584	110
Number of Observations, Cohort 5	144	453	309
<i>B. Single Women</i>			
Woman's Earnings	-12.0%	25.8%	-1.6%
Other Income	16.3%	-11.0%	301.1%
Total Family Income	2.6%	10.2%	22.7%
Family Size	-9.2%	-22.8%	9.0%
Adjusted Family Income	3.1%	26.3%	19.7%
Number of Observations, Cohort 1	178	129	22
Number of Observations, Cohort 5	127	206	130

Notes: Respondents who attended college but completed fewer than four years are not included in the table. All dollar amounts are expressed in constant 1990 dollars.

to their parents' generation by 24% for women without a high school diploma, by 34% for high school graduates, and by 49% for college graduates. Among all married women in Cohort 5 who did not attend college, mean husband's earnings was below mean earnings of married men in their father's generation, in real terms. Among college graduates, husband's earnings increased by 10% over husband's earnings in Cohort 1. Although wife's earnings increased across all educational groups, the improvement was most dramatic for high school graduates, for whom married women's earnings increased by 106%. Educational attainment was also an important determinant of economic well-being for single women. Among single women, respondents who completed four years of high school have fared much better over time than women who did not complete high school.

Because of differences in the distribution of educational attainment between the two cohorts, we must be cautious about interpreting cohort differences in income trajectories by education. The percentage of women who attended four years of college was much higher, and the percentage of women failing to complete high school much lower, in Cohort 5 than Cohort 1. As a result, high school dropouts in Cohort 5 were relatively more disadvantaged than dropouts in Cohort 1, while college graduates in Cohort 1 occupied a relatively more privileged position than college graduates in Cohort 5. Classifying high school dropouts as members of the same disadvantaged social class in each cohort will overstate the decline in income experienced by the bottom of the income distribution, because we are comparing economic outcomes for the bottom 49% of women in Cohort 1 (those who did not complete high school) with the bottom 20% of women in Cohort 5. Similarly, classifying all college graduates across cohorts in the same advantaged class will understate income growth near the top of the distribution, because we are comparing economic outcomes for the top 8% of the distribution in Cohort 1 with the top 32% of the distribution in Cohort 5. Our results indicate that high school dropouts born after World War II received only slightly higher levels of income than high school dropouts born before the war, but do not indicate how individuals at different levels of the income distribution have fared across cohorts. To investigate distributional issues over time, we now turn to estimates of Gini coefficients, the proportion of respondents with low income, and the proportion of respondents who change their position within the income distribution.

Gini Coefficients

Figure 11.5 plots Gini coefficients for adjusted family income by age for each cohort. We find little difference in overall inequality by cohort at ages 40–44, when coefficients for all cohorts range from 0.35 to 0.32. Despite the large

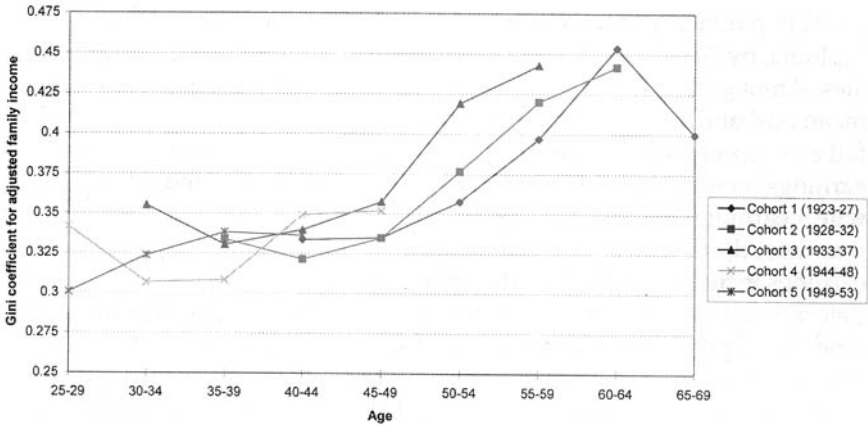


FIGURE 11.5 Gini Coefficients by Age and Cohort

Source: NLSMW and NLSYW

premium earned by college graduates in baby boom cohorts relative to earlier cohorts, overall inequality is not substantially greater for the baby boom cohorts. The rise in inequality that would be expected to follow increases in income earned by persons near the top of the distribution may be offset by increases in the proportion of the population with college degrees, or the increase in inequality may not become apparent until later in the lifecycle.

After age 45, the Gini coefficients for adjusted family income begin to increase sharply with age. For example, the Gini coefficient for Cohort 3 increases from 0.36 at ages 45–49 to 0.44 at ages 55–59. The rise in inequality is greatest for the most recent cohort observed after age 50. The Gini coefficient for Cohort 3 at age 55–59 is substantially greater than the coefficient for Cohort 1, which is only 0.40. It is too soon to determine whether the trend of increasing inequality at later life across successive cohorts will continue for the baby boom cohorts.

The increase in inequality with age appears to result from both rising earnings inequality among current workers and selective withdrawal from the labor force. Within each cohort, estimated Gini coefficients for husband's earnings among husbands who remain in the labor force increase slowly with age, reflecting differences in past investments in human capital. Since age-earnings profiles rise more steeply for well-educated workers than for workers with limited formal education, inequality in earnings increases with age. For the three pre-World War II cohorts, Gini coefficients for husband's labor earnings increased sharply in the 1980s, when the relative position of well-educated workers improved substantially (Levy & Murnane, 1992). For example, among husbands with positive earnings in

Cohort 3, the Gini coefficient for husband's earnings rose from 0.25 in 1982, when their wives were in their late forties, to 0.32 in 1987. However, we do not observe sharp increases in inequality in the 1980s within the two younger cohorts, suggesting that recent increases in the returns to education in the labor market have stronger effects on workers during their peak earning years (at midlife), not at the beginning of their careers. If this is the case, then educational differentials are likely to be an increasingly important source of inequality for the baby boomer cohorts as they move into midlife and on into their retirement years.

The overall increase in inequality also results from early labor force withdrawals by relatively low-income workers. For example, among Cohort 3 husbands working in 1982 (when their wives were ages 45–49), mean earnings were 20% higher for men who remained at work five years later than for men who had retired five years later (\$33,989 vs. \$28,341). This reflects in part the earlier onset of health problems leading to disability among less-advantaged, lower-income workers. For example, tabulations by the authors from the 1990 census indicate that among men age 55 in 1990 (members of our Cohort 3), the proportion who reported they were unable to work because of health problems was 2.7% for college graduates, 6.8% for high school graduates, and 18.5% among those who had not graduated from high school. If lower-income workers in cohorts 4 and 5 exhibit a similar disproportionate tendency to withdraw from the labor force early—and there is no reason to predict otherwise—this will be another factor contributing to high late-life inequality for the boomers.

Proportion with Low Income

The relatively high levels of mean adjusted family income that we found for the baby boom cohorts and the observed stability in overall income inequality across cohorts do not necessarily imply that fewer families in the baby boom cohorts receive very little income, in absolute terms, than earlier cohorts. To explore changes across cohorts in the prevalence of low income, we estimate the fraction of respondents with family income below 125% of the poverty line. The results are plotted in Figure 11.6 by cohort and age. We find that somewhat fewer respondents in the baby boom cohorts had very low income than in earlier cohorts. For example, at ages 40–44, 11% of respondents in Cohort 5 had low income, compared to 18% of respondents in Cohort 1. Rates of low income appear to fall with each succeeding cohort. For example, fewer families were below 125% of the poverty line in Cohort 5 than in Cohort 4 at every observed age range except for ages 30–34, when Cohort 5 respondents experienced the 1980–82 recession. Similarly, rates of low income for Cohort 4 never exceed the rates for Cohort 3. Within a cohort, however, rates of low income increase

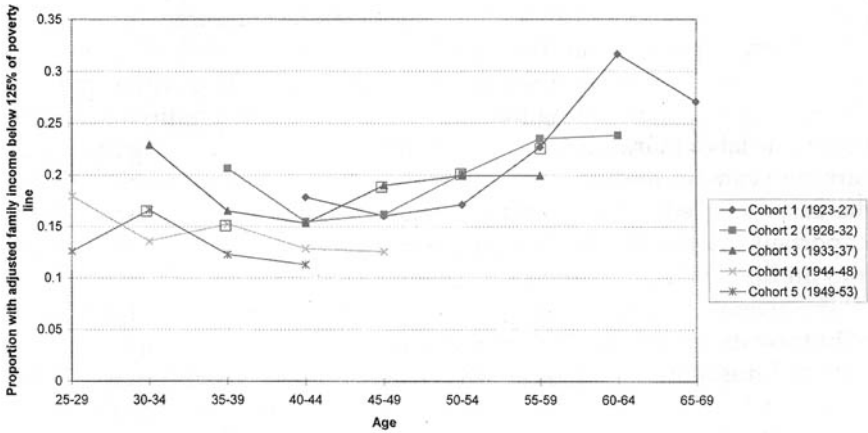


FIGURE 11.6 Proportion of Respondents with Low Income, by Age and Cohort
Source: NLSMW and NLSYW

Note: Boxed observations denote recession of 1980–82.

through midlife, after age 50. In Cohort 1, for example, twice the fraction of respondents reported low income at ages 60 to 64 as at ages 45 to 49.

Although overall rates of poverty or near poverty have declined over time, there has not been a substantial reduction in the prevalence of low income among women who did not continue their education beyond high school. For example, among high school graduates at ages 40 to 44, 11% of women in Cohort 5 received family income below 125% of the poverty line, compared with 13% of women in Cohort 1. Rates of near poverty have actually increased over time for high school dropouts. Again at ages 40 to 44, 32% of high school dropouts in Cohort 5 had low income, compared to 27% of dropouts in Cohort 1.

Income Mobility

A reduction in prospects for economic mobility for lower-income individuals is another possible way in which wage stagnation in recent years may affect retirement prospects for baby boomers. If persons in post-war birth cohorts who began life in the lower reaches of the income distribution have been less able to improve their relative economic position as they move through the lifecourse than was the case for such individuals in earlier generations, then early life circumstances will be more important in the determination of retirement prospects in the coming years than they have been in the past. Figure 11.7 reports the fraction of respondents by age and cohort in the top two income quintiles who were in the bottom two income quintiles at the previous observation five years earlier. Across all ages and

cohorts, about 13% of observations in the bottom 40% of the income distribution had moved into the top 40% of the distribution five years later. The income distribution appears to be most stable for women in their forties, while income mobility is higher for older women and (especially) for younger women. For example, across all cohorts, 12% of women ages 45 to 49 moved into the top 40% of the income distribution from the bottom 40% five years earlier, compared to 16% of women ages 30 to 34 and 13% of women ages 55 to 59. We find some indication that upward income mobility has become less common over time. At each observed age, the proportion of women moving from the bottom two income quintiles into the top two income quintiles declines with each successive cohort.⁸ For example, 18% of 30- to 34-year-old women in Cohort 4 moved into the top 40% of the distribution, compared to only 15% of 30- to 34-year-olds in Cohort 5. In addition, at ages 45 to 49, 14% of women in Cohort 1 moved into the top two quintiles, whereas only 11% of women in Cohort 4 moved into the top two quintiles. However, none of the separate age-by-age differences in upward mobility across cohorts is statistically significant.

The flip side of the analysis reported above concerns downward income mobility, which is explored in Figure 11.8. The chart reports the proportion of respondents who fall into the bottom two quintiles of the income distribution, by age and cohort, among women in the top two quintiles of the distribution five years earlier. Overall, about 15% of observations in the top

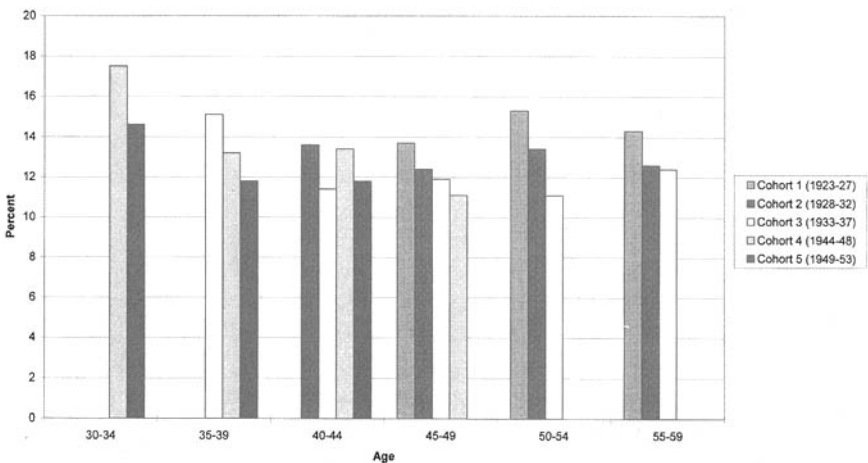


FIGURE 11.7 Percentage of Women Moving into Top Two Quintiles of Income Distribution, Among Women in Bottom Two Quintiles Five Years Earlier

Source: NLSMW and NLSYW

Note: Income quintiles based on adjusted family income.

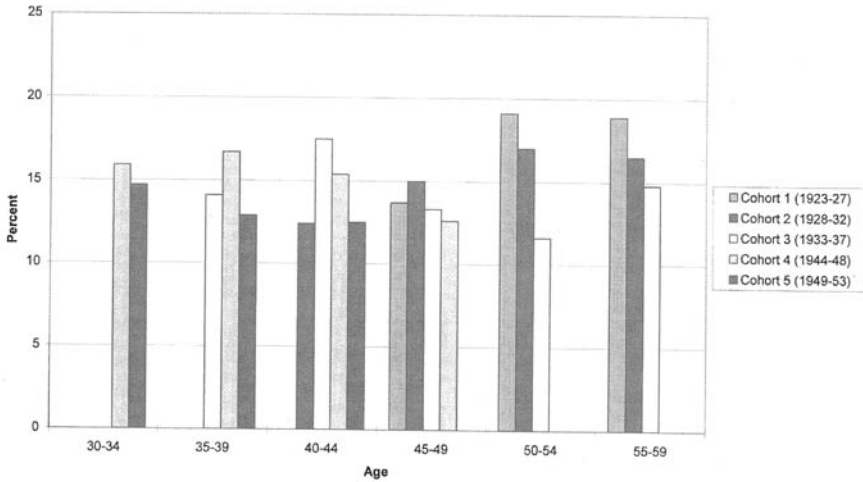


FIGURE 11.8 Percentage of Women Falling into Bottom Two Quintiles of Income Distribution, Among Women in Top Two Quintiles Five Years Earlier

Source: NLSMW and NLSYW

Note: Income quintiles based on adjusted family income.

40% of the income distribution had fallen into the bottom 40% of the distribution five years later. Downward economic mobility appears particularly pronounced late in midlife, with 16% of observations at ages 50 to 54 and 17% of observations at ages 55 to 59 falling into the bottom two quintiles. Downward mobility during one's fifties may reflect early retirement by relatively affluent families. As with upward income mobility, we find indications that downward income mobility is becoming less common over time, as fewer women in our sample move from the top two quintiles of the income distribution into the bottom two quintiles with each successive cohort (although the relationship is not monotonic at ages 35 to 39, 40 to 44, or 45 to 49). Chi-square tests indicate the presence of statistically significant ($p < .05$) relationships between downward economic mobility and cohort for ages 40 to 44 and ages 50 to 54, but not at other ages.

Table 11.4 reports logit estimates of the log odds of moving between the bottom two quintiles and the top two quintiles of the income distribution, controlling for age and cohort. This analysis allows us to pool the separate age-specific comparisons in mobility rates across cohorts, and test the statistical significance of the cohort differences. The first column of the table estimates the log odds of rising into the top two quintiles, conditional on being in the bottom two quintiles five years earlier, and the second column estimates the probability of falling into the bottom two quintiles,

TABLE 11.4. Logit Estimates of Moving Between the Bottom Two and Top Two Quintiles of the Income Distribution

	Log Odds of Rising from the Bottom Two Quintiles to the Top Two Quintiles	Log Odds of Falling from the Top Two Quintiles to the Bottom Two Quintiles
Cohort		
One (1923–27)	—	—
Two (1928–32)	–0.143 (0.102) [0.867]	–0.149 (0.094) [0.862]
Three (1933–37)	–0.232** (0.107) [0.793]	–0.210** (0.099) [0.810]
Four (1944–48)	–0.231* (0.121) [0.794]	–0.142 (0.113) [0.868]
Five (1949–53)	–0.397*** (0.134) [0.672]	–0.333*** (0.125) [0.717]
Age		
30–34	0.433*** (0.147) [1.541]	0.006 (0.137) [1.006]
35–39	0.190 (0.135) [1.209]	–0.060 (0.123) [0.942]
40–44	0.093 (0.122) [1.097]	–0.107 (0.111) [0.898]
45–49	–0.045 (0.112) [0.956]	–0.253** (0.102) [0.777]
50–54	0.030 (0.117) [1.031]	–0.043 (0.105) [0.958]
55–59	—	—
Intercept	–1.777*** (0.101)	–1.482*** (0.089)
Log likelihood	3780.4	4199.5

Notes: Cell entries denote logit coefficients, with standard errors in parentheses and odds-ratios in square brackets. The income distribution is based on adjusted family income, as defined in the text. The sample is restricted to women between the ages of 30 and 59. Changes in relative economic position are observed during five-year periods.

***significant at the 1% level **significant at the 5% level *significant at the 10% level

conditional on being in the top two quintiles five years earlier. Controlling for age, the chances of upward economic mobility steadily decrease over time. For example, women in Cohort 5 in the bottom 40% of the income distribution are only about two-thirds as likely to move into the top 40% of the income distribution five years later as women in Cohort 1, and this difference is statistically significant ($p < .01$). In addition, women in Cohort 5 are significantly less likely to move from the bottom two quintiles of the income distribution into the top two quintiles than women in Cohort 1, as reported in the second column of the table. This pattern of declining income mobility suggests that recent cohorts of women may be less able to overcome early-life disadvantages and to improve their economic condition over the lifecourse than earlier cohorts of women. This suggests that early-life circumstances may be better predictors of retirement outcomes for future retirees than they have been in the past.

Changes in Pension Coverage Over Time

To this point, we have investigated the retirement prospects of future cohorts of elderly by analyzing cohort differences in pre-retirement income. By affecting future levels of Social Security benefits (which increase with lifetime earnings) and the amount of assets individuals are able to accumulate over their lifetime, changes in income received during the work life will lead to differences in retirement income. Changes over time in pension coverage will also affect retirement income. Figures 11.9

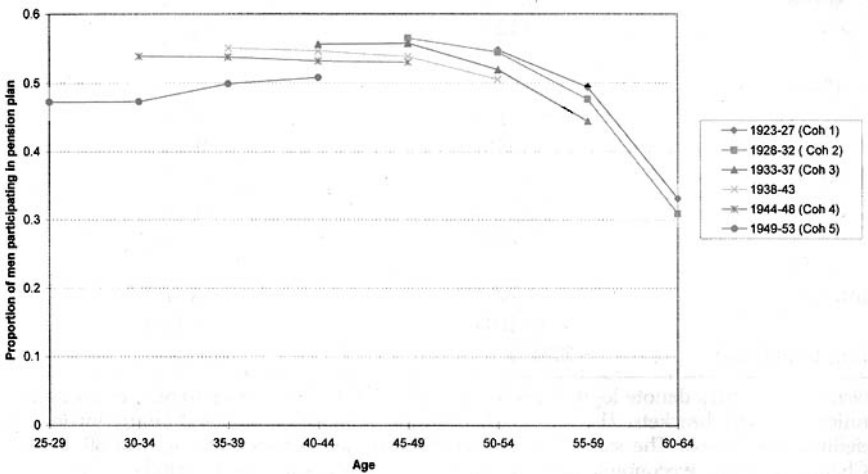


FIGURE 11.9 Pension Coverage Among All Men by Age and Cohort

Source: CPS

and 11.10 plot the fraction of respondents in the CPS who participate in a pension plan sponsored by their employers or unions, by gender, cohort, and age. The data, spanning the years 1980 to 1995, identify only individuals who participate in plans on the current job and do not identify individuals with vested pension rights from former employers. As a result, our estimates understate the true share of the population with pension coverage.

As with labor earnings, we observe striking gender differences in patterns of pension coverage across cohorts. For men in every age group, the prevalence of pension coverage falls with each successive cohort. For example, at ages 40 to 44, 56% of men born in years 1933–37 participated in a pension plan, compared with only 51% of men born in years 1949–53. For women, however, pension coverage has increased over time. For example, at ages 40 to 44, 29% of women born in years 1933–37 participated in a pension plan, compared with 38% of women born in years 1949–53. Although part of the increase in rates of pension coverage among women resulted from higher rates of female labor force participation over time, working women in recent cohorts are also more likely to participate in pension plans than working women in earlier cohorts. When pension coverage trajectories are restricted to current workers, rates of coverage at ages 40 to 44 increase from 44% to 50% between cohorts born in 1933–37 and cohorts born in 1949–53. In contrast, pension participation rates for employed men have been slowly falling over time. For example, at ages 40 to 44, 60% of employed men born in 1933–37 participated in pension plans, compared with only 55% of employed men born in 1949–53.

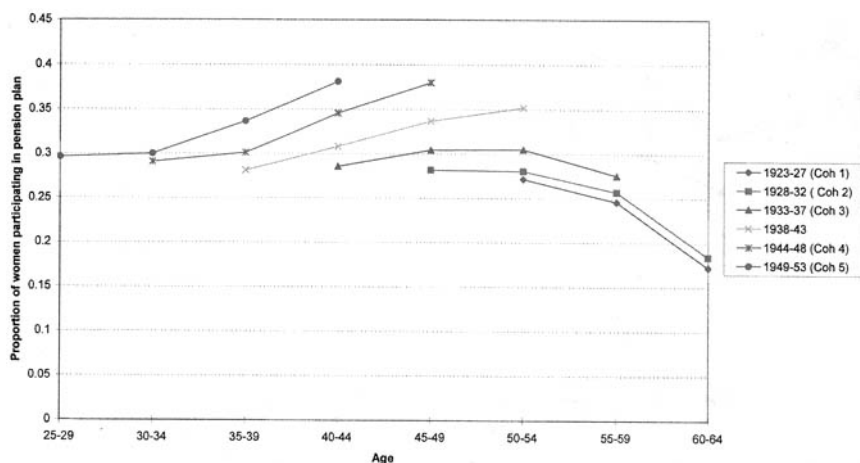


FIGURE 11.10 Pension Coverage Among All Women by Age and Cohort

Source: CPS

The increase in pension coverage rates for women over the past twenty five years appears to have almost exactly offset the decline in pension coverage rates for men. Figure 11.11 plots by age and cohort the proportion of households in which at least one member participates in a pension plan on the current job. The age profile of household coverage rates is remarkably stable over time. Up to age 50, roughly 60% of households include at least one member who belongs to a pension plan on the current job. Household pension rates decline with age beyond age 50, as covered workers begin to retire. Thus, data from the CPS do not indicate that household pension coverage rates have fallen over time, although they do not offer any information about changes in the level of future pension benefits conditional on pension participation.

CONCLUSIONS

Overall, the income trajectories experienced by baby boomers demonstrate improvement over those of cohorts born 20 years earlier. Adjusting for inflation and differences in family size, mean family income at all observed ages is higher for women born after World War II than for women born in the 1920's and 1930's. These findings are consistent with recent studies based on cross-sectional data, which have not found evidence of an impending financial crisis for cohorts about to enter retire-

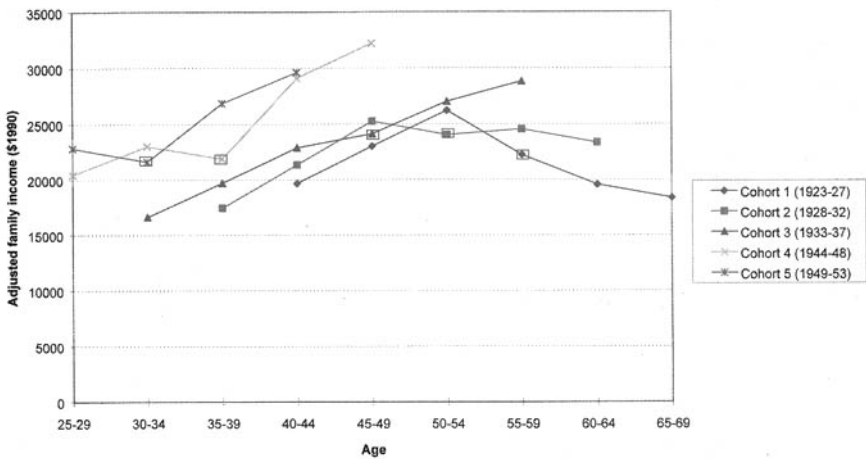


FIGURE 11.11 Pension Coverage Among Households, by Age and Cohort of Women

Source: CPS

ment (Sabelhaus & Manchester, 1995; Easterlin, Schaeffer, & Macunovich, 1993), although our estimates of the overall average improvement are somewhat smaller than those reported by these previous studies. Rates of household pension coverage have remained remarkably stable over time, since the decrease in pension coverage among men has been offset by the increase in pension coverage among women. Rates of near poverty are lower for baby boomers than for their parents' generation. Overall, income inequality at ages 40–45 has remained quite stable across cohorts, despite the well-documented rise in wage inequality during the 1980's. Since changes in the Consumer Price Index, which we use to adjust for price inflation, may substantially overstate the actual rate of inflation, as the Boskin Commission recently concluded (Boskin et al., 1996), our findings may actually understate the true improvement in economic well-being over time.

While the change in overall adjusted mean family income is encouraging, other trends raise concerns. First, the improvement in mean adjusted family income arises largely from increases in women's labor force participation and from reductions in family size. Because the vast majority of married women are now working outside of the home and family sizes are quite small in the most recent cohorts, future growth in adjusted family income must come from increases in wages. It is therefore not surprising that one study found that family income is actually lower for some late boomers, born in the early 1960s, than for earlier baby boomers (Easterlin, Schaeffer, & Macunovich, 1993). Second, our findings suggest that income mobility may have been lower for boomers than pre-boomers, suggesting that the capacity of persons who began life near the bottom of the income distribution to improve their relative economic position may have diminished over time. Consequently, early life circumstances may be more important in the determination of retirement prospects in coming years than they have been in the past. Third, some groups have lagged behind in the general improvement in family income. Whereas women in recent cohorts who graduated from college received substantially more family income than college graduates from earlier cohorts, family income has increased more slowly among women who did not attend college. However, the proportion of women with limited education has dropped sharply over the past generation. Although single men are not included in our NLS samples, they are another group that is unlikely to have fully shared in the general improvement in economic status across cohorts, since husbands' wages have lagged far behind the increase in total family income and single men earn less than married men (Neumark & Korenman, 1991). Finally, consumption needs may have increased for the baby boomers relative to earlier cohorts, so that economic well-being may not have increased as rapidly as family income. For exam-

ple, since both spouses in recent cohorts are generally working, families in recent cohorts experience higher work-related expenses, including such items as the cost of child care, transportation to and from work, union dues, and maintaining work-related wardrobes. In addition, families in recent cohorts may have less access to sources of informal care when they become frail, since they have fewer children than families from earlier cohorts. As a result, baby boomers may need to purchase more formal long-term care after retirement than earlier cohorts, or may be at greater risk of exhausting their personal resources and needing assistance with the cost of such care.

Another area of concern involves the prospect of high income inequality among baby boomers during their retirement years. In comparing levels of income inequality across cohorts, we found that income inequality at ages 40–45 was quite similar for boomers as for the immediately preceding (1923–1937) cohorts. However, consistent with other research on cohorts born in the early part of the twentieth century (Crystal & Waehrer, 1996; Gist & Wu, 2000), we also found that the 1923–37 cohorts demonstrated a marked increase in within-cohort inequality beginning at age 50 and continuing into the retirement years. If the experience of the baby boom cohorts is similar—which appears likely—they will experience a high level of economic inequality in their retirement years. This prospect supports the continued importance of maintaining the redistributive features of the present universal Social Security system, through benefit formulas which provide higher percentages of income replacement for low-wage workers.

A final area of concern is that the overall increase in income during the work life that we document will not necessarily translate into equally large increases in retirement benefits. The bulk of retirement income is received in the form of pension benefits, from either the public sector (as Social Security benefits) or from private pensions earned from past employers. Income from both types of pensions is generally related to lifetime earnings. For each worker, the Social Security Administration computes a Primary Insurance Amount (PIA), which is an increasing function of lifetime earnings. Married couples have the option of receiving Social Security benefits based solely on one spouse's earnings record, in which case they receive 150% of that spouse's PIA, or of receiving benefits based on the earnings of each spouse, in which case they receive benefits equal to 100% of each spouse's PIA. For current retirees, most couples receive benefits based solely on husband's earnings, since wives have historically earned much less over their lifetimes than their husbands. This pattern is likely to continue for the baby boomers, at least for those born before 1954, since we have found that wife's earnings average less than half of their husband's earnings at any given age, and substantially less than half during

childbearing years. Upon widowhood, age-eligible persons can replace retirement benefits with survivor benefits equal to the late spouse's full PIA. For most women in the leading edge of the baby boom, then, Social Security benefits after widowhood will be based on their husband's earnings. As a result, given the stagnation in husband's earnings which we have observed, Social Security income after retirement and after widowhood is also likely to remain stagnant for the baby boom cohorts, even if Congress does not reduce the legislated Social Security replacement rate. Similarly, benefits from private pensions are unlikely to increase across cohorts, since the rise in pension coverage across cohorts results solely from increases in coverage among women, whose benefits will be smaller than benefits received by earlier cohorts of men because women earn lower wages (Johnson, Sambamoorthi, & Crystal, this volume). In addition, the trend toward defined contribution plans and away from traditional defined benefit plans may further erode the value of benefits among those with pension coverage (Gustman & Steinmeier, 1992).

It is important to note that despite the insight which can be gained by comparing income trajectories across cohorts, much uncertainty continues to surround the future retirement prospects of the baby boomers. Younger baby boomers have yet to experience a number of events that will affect their economic status in retirement in important ways. For example, the level of pension wealth and other assets accumulated by the baby boomers will depend upon the business cycle, labor market instability, and levels of wage growth over the next few years, especially since most pension wealth accrues late in the worklife. Moreover, comparisons of income and earnings trajectories by cohort do not account for other issues that can affect retirement outcomes in important ways, such as differences in savings behavior and health status across cohorts. For example, recent evidence indicates that disability rates have been declining among the elderly over the past few years (Manton, Corder, & Stallard, 1993, 1997), which may lead to lower out-of-pocket medical costs and long-term care costs for future retirees. However, the elderly who do become frail in the future may face more limited prospects for informal care and greater need for either privately-purchased or publicly-provided long-term care because they have fewer children on average than past cohorts of elderly Americans (Wolf, 2001).

Despite these caveats, comparison of income trajectories for baby boomer and pre-boomer cohorts does suggest that their overall prospects are better than those of preceding cohorts. A variety of social changes—most notably increased labor force participation of married women and declining family sizes—have buffered the impact of wage stagnation on family economic well-being, and improving pension coverage for women has offset declining pension coverage for men. However, these same

changes affect expenditure needs and potential social support. The prospect of high income inequality in retirement for the baby boomers and lagging outcomes for some subgroups (particularly those with less schooling) suggests the need to temper optimism with considerable caution concerning outcomes for the most vulnerable.

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NOTES

1. Retirement outcomes are also greatly influenced by public policy choices on such matters as the formulas by which Social Security benefits are computed, the structure of Medicare and Medicaid, the generosity and eligibility criteria of income-support programs available to the elderly, and tax policies which favor pension plans and Individual Retirement Accounts. For example, much of the improvement in the economic position of the elderly during the 1970s resulted from Congressionally mandated increases in Social Security benefits.
2. In 1995, 19.9% of men ages 45–64 were not currently married (U.S. Bureau of the Census, 1996).
3. We group individuals by race, education, and marital status because these characteristics are strong predictors of income (see, e.g., Polachek & Siebert, 1993).
4. NLSMW and NLSYW began including questions about respondent pension coverage only in the most recent waves of interviews. As a result, the surveys provide only limited information about changes in pension coverage over time, and do not permit comparisons of coverage between respondents in the two surveys at similar ages. Questions about husband's pension coverage are asked even less frequently.
5. We also computed the fraction of respondents with income below the poverty line and below 150% of the poverty line. Since the relative proportion across cohorts of families with low income was similar for all three definitions of low income, we report only the results based on 125% of the poverty line.
6. The 1938–43 cohort is excluded from the sampling frame of both NLSMW and NLSYW.
7. Growth rates are virtually identical when the analysis is restricted to respondents who remain in the sample through the final waves of interviews. The esti-

mated rates of income growth between the ages of 30–43 and 45–49 for the restricted sample are 44% for Cohort 3 and 39% for Cohort 4.

8. The only exception occurs for women at ages 40 to 44. About 11% of women in Cohort 3 in this age group moved from the bottom two quintiles to the top two quintiles of the income distribution, compared to 13% of women in Cohort 4.

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CHAPTER 12

Prospects for Retirement Resources in an Aging Society

STEPHEN CRYSTAL

DIVISION ON AGING, INSTITUTE FOR HEALTH,
HEALTH CARE POLICY, AND AGING RESEARCH
RUTGERS UNIVERSITY

DENNIS G. SHEA

PENNSYLVANIA STATE UNIVERSITY

In the developed countries, old age has emerged in recent decades as an economically distinct stage of life. An extended period of "retirement" has become normative, older people have become more likely to maintain their own households separate from those of their adult children, and financial support of the elderly is decreasingly seen as the responsibility of these adult children (Crystal, 1982). The question of where this support does and should come from, in the face of a rapidly maturing population age structure with a growing proportion of elderly to working-age individuals, has become a central issue—some would even say *the* central issue—for public policy. As the baby-boom generation approaches its retirement years, these issues become even more critical. The papers in this volume frame a public policy problem—how to equitably make economic provision for a growing elderly population—that has become a central political problem for all of the developed countries, and indeed for developing countries as well.

LATE-LIFE INCOME SECURITY AND INEQUALITY: WHAT ROLE FOR POLICY?

In the Introduction to this volume, we discussed alternative views of the processes that lead to late-life economic outcomes, as well as competing empirical findings on the size and distribution of older people's incomes.

As the papers in the volume demonstrate, these processes are extraordinarily complex. They are shaped by diverse life events, including occupational and labor-force participation histories; health changes; marriage, divorce, and widowhood; and a host of other individual lifecourse changes. All these events interact with the institutional setting formed by societal public policy choices, particularly those related to the structure of retirement income systems, to produce the distribution of economic outcomes experienced by the older population. "Leveling," status maintenance, and cumulative advantage perspectives each have elements of truth in describing these processes. We have suggested, however, that at least in the United States, the level of income inequality is higher after standard "retirement age" than before; that the pattern of later-life economic outcomes is shaped by public policy decisions and varies in significant ways from country to country; and that forming equitable public policy requires an understanding of the way in which individual life events and policy choices interact to affect distributional outcomes, including those aspects that can reasonably be described by the term "cumulative advantage."

In particular, this understanding is crucial for making decisions about the structure and role of public pensions (Social Security in the United States), and especially for proposed changes which would move such systems closer to private-sector models. While the viewpoints and findings of the authors of papers in this volume differ considerably, each sheds light on the complexity of the processes at work, the diversity of influences on late-life well-being, the importance of improving methodology for estimation in this area, and the policy challenges posed by efforts to protect the most-vulnerable among the present and future older population.

In this Conclusion, we discuss the problem of addressing old-age economic security in the future, in the light of the findings of the papers in the volume. The considerable success of past policy in improving the general economic and health circumstances of older persons cannot be ignored. The proportion of older persons in poverty has fallen from more than 35% in 1959 to just over 10% in 2000. Longevity has improved: the average male at age 65 is now expected to live an additional 16 years, and the average female is expected to live an additional 19 years. The rising tide of general economic improvement coupled with age-based universal income and health insurance programs appears to have indeed lifted all (or almost all) boats. However, some boats have been lifted higher than others. General improvement is coupled with high levels of inequality in income, wealth, pensions, and health.

It might be argued that there is no problem here that calls for policy intervention. Is there a role for policy to address inequality *per se*? And,

if so, how does policy to address inequality—which almost by its nature must offer differential costs and benefits to different groups—fit into the current mix. The answer to these questions will help to determine what the future of economic outcomes in later life will be. Carrying forward current policies is perhaps the least problematic politically, at least in the short term, but poses deep challenges for our society as our population ages. At some point we will face the difficult decision of either taxing ourselves more in order to finance current policies or adjusting policy to reduce the costs of benefits. While increasing taxes could certainly ease the problems, it is unclear whether Americans will be willing to pay the tax increases that will in all likelihood be necessary to maintain, let alone expand, the overall current level of generosity of Social Security and Medicare benefits, despite pressures for specific benefit improvements such as a Medicare prescription drug benefit. The problems of continuing to grow and even expand those programs as currently structured, and as younger persons struggle to find health insurance themselves are a political challenge. The projected cost of current benefit structures has led to calls from many political quarters for reform, but a key question is how to adequately protect the well-being of lower-income older people. Some “reform” proposals, such as those that would move from defined-benefit to defined-contribution program designs, might in fact disproportionately disadvantage such individuals.

So, how can public policy address the issues of later life inequality, maintaining control of costs, yet addressing the disparities? Can we modify policy to take into account the diversity of elder experiences, yet not sacrifice the universal aspects of social insurance? What do the insights of longitudinal research on economic and other aspects of well-being contribute to our understanding of the policy solutions?

SOCIAL POLICY FOR OLD AGE AND OTHER STAGES OF THE LIFECOURSE

In the United States at least, old-age policy and other aspects of social policy—in areas such as taxation, disability, and education—are typically debated as separate and unconnected topics, or as competing claims for resources. A broader view of old-age policy, informed by a life-course perspective and taking a long-term view of outcomes, would give greater recognition to the intimate connections between these domains.

This connection is highlighted, for example, by the chapters by Carr and by Farkas in this volume, which suggest that reducing disparities in educational preparation might be one of the best ways to reduce economic

disparities among the future elderly population. One source of these disparities is the reliance on property taxation for funding of education, a system that ensures that low-wealth communities will not be able to match the education provided to youth in higher-wealth communities, and often pits elderly property taxpayers against families with schoolchildren. A focus on the cumulative disadvantage perspective as a guide to future public policy would emphasize that the policies that are required to address the issue should begin when aging begins—at birth. While many gerontologists emphasize this same point, those in the field who focus on policy, including us, often fail to address what it means for aging policy research. The cumulative disadvantage perspective suggests that policy towards the young has deep and lasting implications for the old.

As we have shown in the case of retirement income policies, the school funding example illustrates how processes of cumulative advantage are not simply the inevitable result of inherent individual differences or a largely private-market economic system. Other social policies, such as those determining disability coverage, can moderate—or not moderate—processes of cumulative disadvantage at midlife. Educationally disadvantaged individuals experience the onset of disability at earlier ages than others, for a variety of individual or human-capital reasons. However, the economic consequences of these events depend on the structure of public and private disability-insurance systems. Members of minorities at midlife experience a higher rate of chronic illnesses requiring medical treatment at different rates for a host of individual reasons—but the presence or absence of a universal health insurance system can moderate the impact of these differences on out-of-pocket costs or access to treatment.

In late life, private-sector as well as social-insurance policies shape the process of cumulative advantage. Employers may choose to offer or not to offer private pensions for a variety of firm-specific reasons, but these decisions (at least in the United States) also respond to incentives built into the tax code, and the structure of the plans is federally regulated. Women may move into and out of the workforce in different ways than men for individual reasons, but the impact of these actions on receipt of private pension income is affected by federally regulated rules governing vesting requirements. Widowhood is an individual risk, but its impact is shaped by Social Security survivorship rules. Low-income workers may receive lower Social Security pensions because their pre-retirement contributions to the system were lower, but the formula relating contributions to benefits at different income levels is a policy choice (and the extent of redistribution in the existing system would be difficult to sustain under a privatized system). In a host of ways, public policy choices moderate the relationship between lifecourse events and later-life economic outcomes.

THE CRUCIAL ROLE OF MIDLIFE

The critical role of midlife in setting the stage for disparities in late life is apparent in several of the papers in the volume. As Farkas, Carr, Johnson, and others in this volume note, midlife disparities are in turn shaped by differences in earlier advantages, particularly in terms of education. Midlife disparities involve not only income but access to future pension income and access to health insurance, which, as Carr notes, provide a protective buffer to the events of later life. In one sense, midlife disparities are the result of the effects of market outcomes built on personal efforts, preferences, and decisions; yet it is not simply the market and personal choices that lead to these disparities. For example, although universal health insurance by itself does not eliminate the increased burden of health disparities at midlife experienced by less-advantaged subgroups, its absence can certainly exacerbate the impact of these disparities. In the United States, a result of dependence on an employer-based health insurance system, sustained in large measure by a public policy of tax deductibility for that group insurance is that those who are unemployed or in low wage jobs have limited access to health insurance. A growing body of research documents that lack of insurance, in ways both simple and subtle, leads to poorer access to effective health care, which can result in health outcomes that are worse for these individuals. These factors are not unrelated to the high level of economic and health inequality seen among the United States elderly, even if it is often difficult to determine the causal relationship between health coverage and outcomes.

Poor health and lack of health insurance at midlife set the stage for disparities in late life. For example, hypertension or depression, especially if untreated or undertreated because of poor access to health care, can lead to greater problems with cardiovascular disease and function in later life. Health problems impair the ability to earn and, especially in the absence of health insurance, impair the ability to save, as unexpected health expenses prevent savings. Nearly half of all bankruptcy filings mention medical bills or problems as a proximate reason (Kleinke, 2001).

Dependence on tax deductibility as an incentive for individual or employer purchase of health insurance also contributes to disparities in coverage. The nature of tax deduction is that it provides the largest benefit to those with the highest marginal incomes. The typical high-income person in the U.S. receives a benefit of \$2,357 from this policy, while lower income people receive benefits of just \$71 (Shiels & Hogan, 1999). Policy, as well as the market, provides the well-off in mid-life with the ability to purchase the best and most comprehensive insurance, while leaving lower income persons with more limited choice of coverage or no coverage at all.

Individual and corporate tax advantages, of course, play a huge role in much of the pension and retirement saving system as well (and now the funding of college education, too), providing larger public subsidies to those who need them the least. As papers in this volume show, despite some improvements in pension vesting rules in the United States, and increased gender equity in pension coverage, pensions are still much more available to those in better-off economic groups in both mid- and late-life.

These problems are likely to be exacerbated by the trend in pension policy away from defined benefit and toward defined contribution plans. The combination of tax deduction and employer matching provides powerful forces for developing inequality in pension income. Many are now seeing defined contribution as the wave of the future in health insurance as well (Christenson, 2002). The optional nature of typical defined-contribution plans adds an additional element that tends to disadvantage low-income and less-educated workers, who may not have the discretionary income to contribute current income toward future protection or who may utilize them less effectively in other respects. For example, lower-income workers are least likely to diversify and to hold growth equities. As economists discovered at the beginning of this decade, saving is an "acquired and self-generating habit" (Wise, 1992, p.26), which low-income workers growing up in low savings households may be less likely to develop.

PROCESSES LEADING TO LATE-LIFE INEQUALITY AND MODERATING FACTORS

As the above discussion suggests, health-related life events are important determinants of late-life economic outcomes, but their effects can be moderated by a number of factors, many of which are the result of policy choices. These moderating factors can be illustrated by the following conceptual framework (Figure 12.1), which combines the cumulative advantage/cumulative disadvantage perspective with perspectives from disablement theory that characterize the process by which biological changes in individuals, such as particular chronic diseases, ultimately lead (or do not lead) to role performance differences, such as discontinuation of employment (Verbrugge & Jette, 1994; Johnson & Wolinsky, 1993). Research informed by the cumulative advantage perspective has typically focused on issues of financial well-being, while research in the disablement tradition has typically focused on health status differences. Since health status and financial well-being are so intimately interrelated, however, there is considerable potential for integrating aspects of the two perspectives.

An important compatibility between the two perspectives is that both treat individual-level outcomes as the result of interactions between

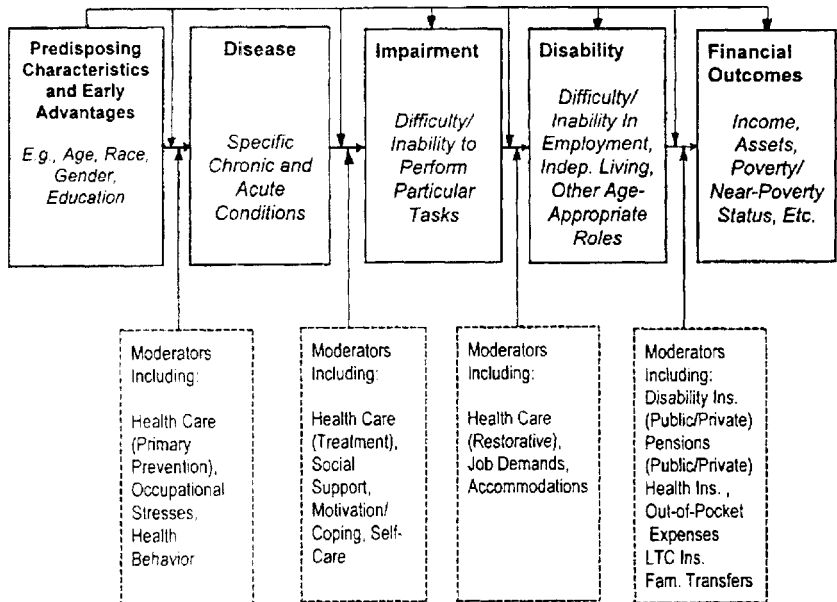


FIGURE 12.1 Conceptual Framework: Health Inequality, Disablement, and Cumulative Advantage Over the Life Course

life-course events on the one hand and socioeconomic settings, constraints and institutions on the other. Cumulative advantage theorists, for example, would note that intermittent labor force participation patterns by women juggling family and career may or may not cause financial privation in late life, depending on the structure of vesting rules in private pension systems. Disablement theorists would note that an accident leading to the need to use a wheelchair may or may not lead to work disability, depending on whether the individual's occupation is manual or professional and the extent to which the employer is willing to make accommodations. In either case, the impact of individual-level life-course events on more distal outcomes is seen as being moderated by resources and demands of the social and institutional environment.

The disablement process has been conceptualized somewhat differently by various researchers, but each of the major accounts has in common the notion that proximal changes in bodily functioning ultimately lead to more distal changes in role performance, health perceptions, or other outcomes, in a process which is moderated by social and environmental demands and resources. Drawing from the disablement tradition, we conceptualize health difficulties and their impact in terms of a process that proceeds from physiological dysfunction to performance limitation to disability. We extend this

conceptualization by integrating into the model the impact of health problems at these various levels on financial well-being (which is, of course, also shaped by the social and demographic characteristics in the leftmost block of the model and by other variables). Social characteristics assumed to represent predisposing characteristics or risk factors include age; demographic characteristics such as race and gender; and "human capital" and initial-advantage characteristics established relatively early in the life course, such as years of education. Much of the process of occupational selection also occurs prior in the life course to the onset of the majority of midlife and later-life health problems and to this extent can be considered as part of this set of variables. These characteristics are conceptualized as influencing the risk of dysfunction or disadvantage with respect to each of the subsequent blocks of variables, and also as potential moderators (or buffers) for the effects of disease on impairment, impairment on disability, and disability on financial disadvantage.

For present purposes, of particular relevance is the fact that many of these moderating factors, which can buffer the economic impact of health-related events, are likely to be either strongly affected by education (especially for those in the left-hand or more distal blocks of variables) or are closely related to social policy choices (particularly for those on the right-hand side of the model, more proximal to financial outcomes). Spelling out the causal sequences leading to economic outcomes, as this model does, can help provide a framework for understanding the pervasive effects of educational attainment on later outcomes, particularly with respect to health-related aspects of the process that become more central as age increases.

Education operates pervasively at multiple levels of the process. For example, those with less formal education are at higher risk of specific conditions such as diabetes, hypertension, obstructive pulmonary disease, cardiac disease, and other conditions. They may be less able to reduce the impact of these conditions or slow their progression by seeking out and accessing appropriate health care or by self-care/behavioral change strategies. This may in turn increase the impact of their conditions on functional impairment (e.g., the ability to perform specific tasks such as lifting, climbing stairs, or walking specified distances). These impairments can then increase the risk of disability with respect to employment (difficulty or inability to work at a job) or with respect to performance of other roles and multi-task activities. A given level of impairment may be less likely to be disabling for a college-educated individual whose occupation draws heavily on knowledge and cognitive skills, and whose value to the employer is such that accommodations to his or her impairments are provided, than for an individual with less than high school education. Finally, the financial impact of disablement on income may be buffered

for a better-educated individual by actions such as purchase of private disability insurance.

While individual advantages, such as educational attainment, can buffer the impact of health changes on economic outcomes, this relationship is also shaped by public policy choices and the structure of societal institutions. Most obviously, access to health insurance is critical in moderating these impacts, particularly for those individuals who experience disability and serious health problems before the normal retirement age. While individuals over age 65 have access to at least a basic level of health insurance through the Medicare program, coverage for workers who withdraw from the labor force for health reasons "prematurely" is more uncertain, particularly if such individuals do not meet the criteria for Social Security disability pensions. Similarly, the adequacy of disability income programs is a critical public policy choice shaping late-life outcomes.

ADEQUACY AND EQUITY IN RETIREMENT INCOME: PROSPECTS FOR THE FUTURE

Taken together, the analyses in this volume suggest that the wide gulf between the economic fortunes of the prosperous and the penurious elderly in the United States is not simply the result of some sort of natural or inevitable process, but reflects specific retirement income system policy choices. While the Social Security program is modestly redistributive in that benefit formulas provide a higher percentage of replacement for lower pre-retirement incomes than for higher ones, it is less so than systems that countries include relatively high minimum benefits, flat-rate benefits, and/or a larger role for means-tested benefits.

The fact that late-life inequality results from interaction between life course events and social policies, rather than being an inevitable result of cumulative advantage processes, is demonstrated by the wide variability across countries in late-life equality reported by Disney and Whitehouse in their chapter. For example, their Figure 4.9 shows that pensioner inequality in the U.S. exceeds by a substantial margin the level in any of the comparison countries with the exception of Greece. The moderately redistributive structure of the Social Security system in the U.S. is outbalanced by the stronger unequalizing influence of existing private retirement income systems. In this context, it should be noted that proposed changes toward a partially-privatized, less redistributive Social Security system in the U.S. could make the U.S. even more of an outlier in the world in terms of old-age inequality.

The substantial role of employer-sponsored pension benefits is one factor that contributes significantly to old-age income inequality, as the papers

on pension wealth suggest. The important role of this system and the skewed distribution of its benefits, like the pattern of Social Security benefits, have been shaped by public policy choices. Employer-sponsored plans in the United States began to be established on a widespread basis during World War II when they served as a means of bypassing wartime wage controls to recruit scarce workers. Their growth in the postwar period was fostered by preferential tax treatment which generates large tax advantages or "tax expenditures" because taxation can be deferred for decades on compensation paid in the form of pension benefits. Since a dollar of tax deduction is worth more to an individual in a high income tax bracket than to one in a low bracket, the distribution of the tax benefits is skewed more toward upper-income levels than is the distribution of the benefits themselves.

Publicly financed health care, both for the elderly and at midlife, is a critical buffering variable between health changes and late-life economic consequences. However, quite different stakes in improvements in publicly funded health care programs are held by those at different levels of economic well-being. Far from being a relatively homogeneous "class" of its own with distinct policy interests, older people are highly divergent in their degree of vulnerability to health-related contingencies. Vulnerabilities tend to be "clustered;" poor health, functional limitations, lack of insurance coverage, low income, and low assets all tend to occur within the same subgroups. In this setting, improvements in publicly funded health care are likely to moderate inequality among present and future cohorts of elderly, while moves to privatized or "defined-contribution" approaches to health care financing may exacerbate it.

Finally, as each of the papers illustrates in its own way, it continues to be important to understand the diversity of circumstances, needs and interests that exists among the older population. Along with maintaining support for universal social insurance programs for older people that help to buffer inequality by maintaining a floor under economic well-being and health access, it is important to improve the social safety net for older individuals with special needs such as those for long-term care. As the elderly population grows and the problems of financing old-age benefits become increasingly politically contentious, better understanding of the diversity of circumstances and needs among older people becomes increasingly important.

Much remains to be learned about the way in which life events and social policies interact to shape this varied pattern of outcomes. Such research can play an important role in exploding myths of aging; monitoring evolving patterns of economic well-being in later life; demonstrating the links between policies and programs in retirement income, health care, and other arenas; and clarifying some of the probable impacts of

alternative policy choices. As we consider the development of widely acceptable solutions to these problems, it is important to think in long-term, life-course terms; to understand the complex ways in which individual life-course events interact with societal institutions and policies; to avoid dealing with old-age policy and other social policies in separate "silos;" to appreciate the key role of midlife and recognize that interventions aimed at reducing late-life disparities should begin much earlier than age 65; and to craft social-protection policies that seek common ground between generations rather than pitting age-group interests against one another.

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Stephen Crystal, Ph.D., is Research Professor and Chair of the Division on Aging at Rutgers University's Institute for Health, Health Care Policy, and Aging Research. He also serves as Associate Director for Health Services Research at the Institute; Director, AIDS Research Group; Associate Director for Research of the Institute's Center for State Health Policy; and Professor of Public Health at the UMDNJ School of Public Health. He previously served as Chief of the Division of Health Care Sciences at the University of California, San Diego, School of Medicine and as Visiting Professor of Health Care Policy at Harvard Medical School. Dr. Crystal is a gerontologist and health services researcher whose research focuses on health policy and care for the elderly and persons with chronic health conditions. He is author of more than 100 books, research articles and technical reports in these areas. In a continuing line of work that began with his book *America's Old Age Crisis: Public Policy and The Two Worlds of Aging* (Basic Books, 1981) and has continued to the present, he has explored in numerous publications the impacts of lifecourse events and public policies on later-life economic outcomes, and the role of cumulative advantage processes in shaping the distribution of resources in old age. His awards include the Abt Associates Public Policy Research Award and (with Dennis Shea) the John Kendrick Prize of the International Association for Research in Income and Wealth, for outstanding contribution to *The Review of Income and Wealth*. He has also published extensively on health care and health financing for older people. He is a Fellow of the Gerontological Society of America and has served as Chair of the Society's Public Policy Committee.

Dennis Shea, Ph.D., is a Professor of Health Policy and Administration in the College of Health and Human Development at the Pennsylvania State University and faculty affiliate of the Center for Health Care and Policy Research, Social Science Research Institute, and Gerontology Center. Dr. Shea's primary areas of research are in the impact of health policy, insurance, income, and other economic and financial factors on health services cost and use of older persons, particularly in the areas of physician services, mental health, and prescription drugs. Dr. Shea is a graduate of the College of William and Mary, Cambridge University, and Rutgers University.