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Essential Topics in Applied Linguistics and Multilingualism

Studies in Honor of David Singleton

Springer

Second Language Learning and Teaching

Series Editor

Mirosław Pawlak

About the Series

The series brings together volumes dealing with different aspects of learning and teaching second and foreign languages. The titles included are both monographs and edited collections focusing on a variety of topics ranging from the processes underlying second language acquisition, through various aspects of language learning in instructed and non-instructed settings, to different facets of the teaching process, including syllabus choice, materials design, classroom practices and evaluation. The publications reflect state-of-the-art developments in those areas, they adopt a wide range of theoretical perspectives and follow diverse research paradigms. The intended audience are all those who are interested in naturalistic and classroom second language acquisition, including researchers, methodologists, curriculum and materials designers, teachers and undergraduate and graduate students undertaking empirical investigations of how second languages are learnt and taught.

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Preface

This volume is intended as a tribute to Professor David Singleton, a truly exceptional person in many different ways. For one thing, even a cursory look at his long list of publications testifies to the astounding breadth of his research interests, including not only those best-known, such as crosslinguistic influence, the age factor, vocabulary, or multilingualism, but also those somewhat less-known, such as syllabus and materials design, the communicative approach, the teaching of Irish, or the cultural and linguistic experiences of immigrants. It is also clear that many of his books and papers have been extremely influential or even ground-breaking, sometimes paving the way for entirely new research avenues, excellent examples being his work on the interface between age and affect or on the role of affordances in second language acquisition. However, apart from so successfully advancing his own career, David Singleton has always been concerned with the careers of others, being extremely adept in seeking out real talents and offering opportunities for them to rise and shine in the field. This support has taken the form of supervising doctoral dissertations, inviting scholars to publish their work in his highly respected series on second language acquisition with Multilingual Matters, agreeing to serve on editorial boards of newly launched journals, and contributing papers to those journals or different edited collections, thus immensely enhancing their scholarly value. David Singleton is also a very good friend and colleague, someone with whom we have been working, meeting at conferences, co-authoring books and papers, trying to stay in touch and simply talking about a variety of topics on different occasions. That he performs superbly in all of those capacities and the great respect that he enjoys is evident in the fact that so many distinguished scholars from around the world have so willingly agreed to contribute to this edited collection.

The book has been divided into two parts in accordance with the two leading themes in the title, each containing contributions dealing with different facets of the main theme. Part I, entitled *Essential Topics in Applied Linguistics*, brings together eight papers on teaching and learning second language skills and sub-systems, and exploring the role of individual learner differences. First, Michael Sharwood Smith focuses on the role of affect in learning a second language, adopting as a point of reference the MOGUL framework. Anna B. Cieślicka, Roberto R. Heredia and Marc Olivares report the findings of a study which aimed to determine the effect of language dominance, salience and context on eye

movement during processing idiomatic language. The next three papers deal with the role of cognitive factors in language learning, with David Birdsong emphasizing the need to update the Critical Period Hypothesis, Carmen Muñoz exploring the relationship between aptitude and foreign language skills, and Agni Skrzypek investigating the role of phonological short-term memory in the occurrence of crosslinguistic transfer. Then, Mirosław Pawlak, Anna Mystkowska-Wiertelak and Jakub Bielak report the results of a study which examined the dynamic nature of second language learning motivation in the course of single lessons and sequences of such lessons, and Judit Navracsics, Gyula Sáry, Szilvia Bátyi and Csilla Varga tap into the attitudes to the Hungarian language and awareness of this language among different groups of learners. Finally, Joanna Nijakowska discusses the findings of a TEFL Dys Project which provides insights into the professional needs of language teachers who have to deal with dyslexia in their everyday work. Part II, *Essential Topics in Multilingualism*, includes nine papers which are also devoted to a variety of topics. It opens with a contribution by Larissa Aronin, who discusses the importance of affordances in language learning, teaching and use, focusing in particular on affordances offered by material culture. The next two papers deal with the nature of multilingualism, with Ulrike Jessner stressing the role of metalinguistic awareness in multilingual learning as well as pointing to the need to adopt a dynamic systems perspective in investigating this process, and Danuta Gabryś-Barker using written narratives to illuminate issues involved in thinking in many languages in learners who get to know those languages through formal instruction. Romana Kopečková and then Justyna Leśniewska and Ewa Witalisz report the findings of studies which examined crosslinguistic influence in young learners, the former in the case of phonology and the latter with respect to syntax, morphology and lexis. Muiris Ó Laoire, in turn, uses narratives to explore the facilitative effect of learning Irish on the acquisition of a third language, while Christina Lindqvist and Camilla Bardel investigate the influence of proficiency and typological factors on oral production in the third language. Finally, Vivian Cook makes a comparison between standard punctuation and punctuation in street signs, and Kees de Bot, in a paper that departs somewhat from the academic tone of the articles included in the collection, traces the changes in the views on the nature of the lexicon over time. We are convinced that, thanks to the themes covered, many new perspectives on many aspects of applied linguistics and multilingualism, and the excellent quality of the scholarship, the volume will be of interest to wide audiences, ranging from experts in the field to graduate and postgraduate students.

Mirosław Pawlak
Larissa Aronin

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Part I
Essential Topics in Applied Linguistics

Can you Learn to Love Grammar and so Make it Grow? On the Role of Affect in L2 Development

Michael Sharwood Smith

Abstract In the nineteen seventies, Burt and Dulay suggested that negative emotions might act as an input filter inhibiting grammatical development. This idea was reformulated by Krashen as the Affective Filter Hypothesis (AFH) (Krashen 1981, 1982). Educators, applied linguists and SLA researchers have all stressed the value of positive attitudes on learning success. Research on emotions and language learning has mostly focused on the lexicon, on individual styles of learning and rates of success (Dörnyei 2003; Dewaele 2005; Pavlenko 2005) rather than the acquisition of, specifically, syntax and phonology. These are areas which, unlike the lexicon, are generally held to become significantly more difficult with age (Singleton 1995 and 1999). However motivated older learners may be to develop their phonological and syntactic skills, the desired development is by no means guaranteed. How may this be explained in terms of the psycholinguistic mechanisms involved? The AFH was stated in very general terms and never really elaborated. Nevertheless, since the AFH was originally formulated, there has been a lot of research on affect in cognitive neuroscience (e.g. Damasio 1994, 1999; LeDoux 2002). To guide investigations into how affect variably influences grammatical, lexical, semantic and pragmatic growth, the AFH is in need of updating. The MOGUL framework, which takes account of recent research across a range of disciplines, will be used to elaborate it in finer detail in a first attempt to provide a better basis for empirical investigation (see also Sharwood Smith and Truscott 2013).

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1 Introduction

An (apparently anonymous) quotation was posted on Facebook recently which read: "If you are not willing to learn, no one can help you. If you are determined to learn, no one can stop you". The thrust of the present discussion will be to consider the possibility that in some cases, even great determination cannot help you acquire grammar and, on the more positive side, unwillingness need not slow down or otherwise impede development while there is continued exposure to the language. The basic issue is how our emotions might influence the largely sub-conscious processes that guide our language learning, but especially the way in which the L2 system develops. A well-known hypothesis advanced in the nineteen seventies will be used as a way of focusing the discussion on the effect of negative emotions on the growth of L2 grammar.

In the early days of second language acquisition (SLA) studies, Marina Burt and Heidi Dulay suggested that negative emotions, such as anxiety and lack of self-confidence, might act as an input filter inhibiting grammatical growth, that is development of L2 morphology and syntax. This they called the *affective filter* (Dulay and Burt 1977). This idea was later reformulated by Stephen Krashen as the *Affective Filter Hypothesis* (AFH) which he incorporated into a more general model of SLA (Krashen 1982, 1985). Many researchers and practitioners in various related fields having to do with second language learning have all stressed the value of positive attitudes on learning success and the inhibiting effects of negative attitudes. The AFH focused on the inhibiting effects which most people would surely accept as holding for any kind of learning in general although this particular hypothesis was inhibition of a very specific type. As the field of SLA continued to establish itself as a separate area of research in the nineteen eighties, the initial focus of many researchers into L2 development was on the more purely linguistic aspects of the acquisition of morphology and syntax. Where emotional aspects of language learning did attract attention, interest was focused more on individual variation in learning success overall, and on lexical and pragmatic issues rather than on basic morphological and syntactic development.

This chapter will not attempt to provide a full review of all the many and various studies that have appeared to date in the applied linguistic, general psychological and educational literature on emotion, attitudes and motivation (e.g. Maslow 1943; Alderfer 1972; Gardner and Lambert 1972; Dörnyei and Otto 1998; Oxford and Shearin 1994; Oxford 1996; Van Lier 1996; Dörnyei 2001; Dewaele and Pavlenko 2002; Dörnyei 2003; Dewaele 2005, 2010). Instead, it will focus on the on-line psycholinguistic mechanisms involved whereby affect influences or fails to influence the shape and course of acquisition an attempt will be made to bring further conceptual clarity into this very specific aspect of an otherwise vast subject.

2 Emotions and Language Learning

The AFH has always remained tied specifically to linguistic development, and development particularly in a second language learning context. An Internet search through the language acquisition and language teaching literature bears testimony to the popularity of the concept of an affective filter. The filter metaphor seems to have been seized upon by many authors as a convenient term for discussing emotionally inhibiting factors in language learning. At the same time, even though the AFH was very much about grammatical growth, the discussion has not, as already suggested, led to much refinement of the hypothesis in precise psycho-linguistic terms apart from the factoring out of component aspects, such as low self-esteem or negative attitudes to language learning, all themselves very general in nature and familiar from similar discussions about other kinds of learning. In other words, if the AFH has been used as a handy term for emotional problems inhibiting language learning in general, it has also seen little elaboration by researchers interested in just those areas where the hypothesis was supposed to be relevant. This may be attributed in part to the state of research into emotion at the time generally although more recently there have been interesting developments, particularly in neuroscience that may be used to refine the conceptual basis of the AFH being asked (LeDoux 1996; Lane and Nadel 2000; LeDoux 2002).

Interest in the role of emotions in learning success did give rise to Gardner and Lambert's pioneering research on motivation in language learning (Gardner and Lambert 1972). This introduced the well-known distinction between *integrative* and *instrumental motivation* and this in turn sparked a large and continuing flow of publications on various emotional issues affecting learners and users of an L2 (see, for example, Dewaele and Pavlenko 2002; Dörnyei 2003; Dewaele 2005; Pavlenko 2005). There has been one notable line of discussion in the research literature bearing on issues affecting the growth of morphosyntax; this was sparked off by John Schumann whose pioneering work on Alberto led him to propose that learners' L2 will remain in pidginized form where they perceive themselves as being socially and psychologically distant from the host society in which they are acquiring their L2. Subsequently, Schumann became interested in the neurological underpinning of this process and has published extensively on the subject (Schumann 1975, 1990; Jacobs and Schumann 1992; Pulvermüller and Schumann 1994; Schumann 1997). Schumann (1997: xv) states: "I believe that emotion underlies most, if not all cognition" and argues that "variable success in second language acquisition (SLA) is emotionally driven".

To sum up so far, with the passage of time, SLA and applied linguistics have seen a growing body of research on emotions and language learning although this has mostly focused on emotional issues relating to the lexicon, sociocultural issues and on individual styles of learning and rates of success rather than the acquisition of grammar, or more specifically, (morpho) syntax and phonology. This seems to have created a disconnect in research between grammatical development and questions of affect. Since Krashen's initial proposals, and with the exception of Schumann's

work, there also seems to have been little attempt to integrate affect within a broader psycholinguistic account except in very general terms. The conclusion must be that new developments in a range of disciplines including psycholinguistics and neurolinguistics should be taken into account to reconnect affect studies with grammatical acquisition research. This would allow an updating, and a more precise elaboration of what the AFH might entail in psycholinguistic terms. How precisely could affect influence the processing of grammatical input? Investigations can profit from a more refined and rigorous framework. Only then can our understanding of how emotions influence emerging grammars be substantially improved.

3 The Affective Filter Hypothesis

The *affective filter* was a term coined by Marina Burt and Heidi Dulay in (1977) to indicate reduced sensitivity to language input caused by particular emotional states such as anxiety as experienced by many second language learners. Whereas the language acquisition mechanisms were hypothesized to be identical in both young children and older learners (contra Selinker 1972), the negative impact of affective factors in second language acquisition was one clear way of differentiating the two acquisition scenarios. The basic idea was that young children typically approach language acquisition with a 'low' affective filter. In other words, they feel no inhibition, they have a positive attitude and are highly motivated. The slower progress overall of older learners and the difficulties they encounter in achieving a full mastery of an L2 may be attributed, following Burt and Dulay (1977), to the inhibiting effects of a 'high' affective filter. All the necessary information may be present in the input and the same subconscious mechanisms that allowed them to perfectly acquire their mother tongue are intact but emotions get in the way and obscure the signals in the input and make them correspondingly harder to read by the internal organiser responsible for creating new grammars. The metaphor of a filter is a useful one for expressing the basic idea although it does not bear too much scrutiny if one wants to explain more precisely how it might work.

When Burt and Dulay collaborated with Stephen Krashen to produce the first book-length exposition of a second language acquisition theory, albeit an embryonic one, the affective filter was reformulated as the Affective Filter Hypothesis (Dulay et al. 1982). It took its place along with other hypotheses to form the core of the proposed model which was later developed by Krashen in numerous publications (Krashen 1981, 1982, 1985). The usual listing of the five hypotheses is as follows with the AFH in fifth position:

1. The Acquisition-Learning Hypothesis.
2. The Monitor Hypothesis.
3. The Natural Order Hypothesis.
4. The Input Hypothesis.
5. The Affective Filter Hypothesis.

For the purposes of the model, the basic idea was clear enough and in the seventies and eighties there was perhaps not enough accessible relevant research on how affect works, especially in grammar learning, to justify further elaboration.[1]

4 Differentiating Different Aspects of L2

The notion 'language' is notoriously vague and some differentiation is almost always required for any sensible discussion. (Morpho) syntax and phonology, the former aspect the initial focus of SLA research, are areas which, unlike the lexicon, are generally held to become significantly more difficult with age and beginning in adolescence (Selinker 1972; Singleton 1995, 1999). Indeed, the more strictly phonetic aspects (the pronunciation) of foreign speech are notoriously difficult for the older learner and seem to depend a great deal on the individual talent, or lack of talent of the learner at imitating non-native speech (but see also Hopp and Schmid 2013). The lexical repertoire of a language (vocabulary) may continue to expand through life but, however motivated an older learners may be to develop their phonetic, phonological and syntactic skills, the desired development appears not to be guaranteed and, as Selinker observed years ago, the vast majority of people fossilise at some point, a phenomenon which he characterised as an inevitable outcome of post-critical period language learning. However, at around the same time, Burt and Dulay, and later Krashen, were contending that this outcome was not inevitable at all and that obstacles to ultimate native-like attainment should be attributed to factors other than the basic, inborn ability to acquire language. Other explanations were possible which went counter to the fossilisation argument. One of the factors that might play a role in inhibiting L2 development was any external limitation imposed on the provision of comprehensible natural language input to the learner. Another one, an internal factor, lay at the heart of the AFH. This factor seemed to relate specifically to the growth of grammar and, by implication, not the expansion of the L2 mental lexicon *per se*. At the same time, it has to be said that this still left open the possibility that the role of lexical growth on grammatical growth might play an indirect but important part in the explanation proffered by the AFH. This issue will be returned to later on in this discussion.

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[1] This of course does hold so obviously for those who regard the acquisition of grammar as driven by exactly the same mechanisms as any other kind of learning but the affective mechanisms that facilitate or inhibit learning in general is still an area that needs a great deal more research.

5 Affect and Valence

In recent psychological and neuroscientific research, there has been a growing appreciation of the important role emotions and the underlying appraisal system play in almost every aspect of our existence (see contributions to Lane et al. 2000). Initially, those interested in neurological accounts adopted the term *affective neuroscience* but this academic demarcation, while justified at the time in establishing a serious field of research, is increasingly seen as misleading; most people now seem to prefer to regard affective processes as an integral part of cognition, and hence belonging to *cognitive* (neuro)science. Affect and cognition are still seen as separate but their respective mental neural processes are very much intertwined (Damasio 2000). The reason why this is so is because, as we seek to deal with the familiar and unfamiliar, we are constantly involved in evaluation. Either we are called upon to evaluate (appraise) something novel or we are following the dictates of earlier appraisals and of those values that are set in advance, i.e. are inborn. This last type of evaluation is something that has evolved over time and represents what is important for the survival of the organism as a whole allowing us to respond instinctively to certain kinds of threat and to be drawn, again instinctively, towards things that will yield some benefit. Evaluation (appraisal) is regarded as the necessary condition for emotions and, as such, could be regarded as most basic element in the affective system as a whole (Lewis 1996).

Evaluation by the organism is often referred to as *valence*. Valence may be positive or negative. These two settings of valence can be attributed to various emotions like anger (negative valence) and happiness (positive valence). This suggests that valence is the most basic way in which the organism 'appraises' something and that all emotions, whatever else distinguished them, have either one or the other type of valence. Valence is at work everywhere, not just in relation to emotional experience. It is hard to imagine any type of cognition without valence playing some role. The discussion in this chapter is, of course, concerned with the way valence works with respect to various aspects of language input. This is no easy matter. If it is true, as some have claimed, that at certain points in grammatical development, for example, the learner become especially sensitive to certain linguistic features in the input to which that same learner has previously been insensitive,[2] this would suggest that those features have acquired a different valence setting. How this might work is at the moment a mystery so the idea of morphosyntactic structures suddenly acquiring positive valence, and therefore attractiveness to whatever the acquisitional mechanisms might be, has to be regarded as extremely speculative at this point. Nevertheless, it is still an interesting speculation, in the light of Izard's claim about the attention-guiding function of affect and its evolutionary benefit, that "a particular emotion sensitizes an

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[2] In Krashen's terms this would be 'i + 1', the next grammatical morpheme to be acquired according to the Input Hypothesis (Krashen 1985).

organism to particular features of its environment" (Izard 1979: 163, cited in Öhman et al. 2000: 298–299).

One interesting aspect of current work on the neuroscience of affect is the idea that emotions do not have to be at the level of awareness. This goes against a common view that emotions are by their very nature conscious. So affect, like cognition in general, can be either subconscious or conscious (see Öhman et al. 2000). One clear example of subconscious affect is reflected in the organism's instinctive response to threat. Although the matter is not completely resolved, many researchers now accept in broad terms what William James thought, when considering whether someone running from a bear is doing so because they feel frightened or whether it is the other way round; he decided that that latter interpretation was true (James 1884, 1894). They are frightened because they are running way, i.e. the experience of fear follows, rather than precedes instinctive flight.[3] The body reacts in various ways as though it is frightened prior to that emotion reaching awareness. To some extent the terminology used by different researchers can be confusing. Damasio, for example, prefers to distinguish *emotions* on the one hand and, on the other, *feelings*, i.e. *feelings of* emotions where only feelings are conscious.

In research on language and emotion, then, when participants of an experiment are asked about their emotional response to given samples of language, be they lexical, grammatical or having to do with speech sounds, they are giving feedback about their *feelings* (in Damasio's terms). Research into their *emotions*, again in the Damasio sense, has to be more circumspect, for example tapping into their physiological responses and not relying on self report. It opens up the possibility that self-reports concerning feelings about language or some selected linguistic elements will not be the whole picture and that there may be subconscious forces at work promoting or inhibiting the use or growth of a new language in the individual about which the individual is only partially aware or not aware at all.

The reality of subconscious processing of emotion comes home in an intriguing study by Wu and Thierry in which they examined the unconscious effects of affective valence on lexical access during second language processing. Fluent Chinese-English bilinguals were asked to make meaning-relatedness judgment on pairs of items presented one after the other in rapid sequence. This involved different combinations of English words. What the participants did not know is that some of the English word pairs hid a sound repetition if translated into Chinese. The ERP[4] analysis showed that that participants making judgements on the relatedness between two English words were affected by concealed sound form repetitions in the Chinese translations (even though they never saw them). For example the Chinese equivalents of the English words might have both contained 'Cheng' as illustrated in the following item pairs: Honesty—'*Cheng* Shi';

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[3] This idea is commonly referred to as the James-Lange Theory.

[4] Event Related Potential: the participants' brain electrical activity was monitored as they performed the tasks.

Programme—'*Cheng* Xu' (Wu and Thierry 2012: 6486). The automatic co-acti-
vation of the native language came as no surprise as it was shown before (Thierry
and Wu 2007; Wu and Thierry 2012). This is a phenomenon that is now accepted
if not by all, certainly by many researchers. However, this phonological priming
effect was only found when the English words had positive or neutral affective
valence; interestingly, no such effect was found for English words with *negative*
affective valence (like 'violence' of 'failure'). The authors interpreted this unex-
pected lack of Chinese translation equivalent activation as showing that affective
processing "interacts with language access in a preventative manner, automati-
cally repressing the full realization of semantic integration when the targeted
meaning is potentially distressing" (Wu and Thierry 2012: 6489).[5]

The qualitative distinction between subconscious affect and conscious affect
(emotion in the 'feeling' sense) also raising an interesting comparison with a much
better known distinction in SLA research, namely between *subconscious cognition*
and *(conscious) metacognition*, or in this case *metalinguistic cognition*, a dis-
tinction that many also believe to be a qualitative one. We may then ask whether
there are interactions between subconscious affect and subconscious linguistic
knowledge, also whether conscious affect and subconscious linguistic knowledge
also interact. Asking such questions is of course very different from deciding how
one could set about investigating such interactions. Perhaps the main point that
surfaces from all this is that all speculations about affect promising or otherwise
will remain vague without some explanatory frameworks to guide them and put
them into some clear more manageable perspective. The rest of this chapter will,
therefore, continue the discussion using such a guiding framework, in this case, it
will be the Modular Use and Growth or Language (MOGUL) framework (Truscott
and Sharwood Smith 2004; Sharwood and Truscott 2013).

6 Modular Use and Growth or Language

To date SLA research has largely been guided by frameworks that cover only
particular aspects of second language acquisition, for example a theoretical lin-
guistic framework like the Minimalist Program. This has allowed researchers to
generate and investigate precise and very specific hypotheses about the linguistic
properties of both learner and attriter grammars. It has nothing to say, and does not
claim to have anything to say about other important aspects of second language
growth such as, for instance, the psycholinguistic mechanisms that deal with
language on-line and especially those mechanisms whereby the on-line processing
of language on given occasions leads to stable changes in the learner's mental

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[5] Thanks are due to Guillaume Thierry for helpful suggestions in interpreting these's results.

grammars and mental lexicons.[6] To investigate this, you need to appeal to a number of psycholinguistic theories to fill the gaps left open by linguistic theory. Despite variations in terminology uses, such psycholinguistic theories may be more of less roughly compatible with the selected linguistic theory but no single framework may exist that integrates them into one explanatory framework. MOGUL is just such a framework. It cannot be called a theory and it is not best described as a theoretical 'model' since it permits, within certain constraints, alternative theories to be applied to one or other aspect of language use and language development. At the same time, this framework is buttressed by experimental findings and concomitant theoretical claims from different research fields. Its intended function is, therefore, to provide a basis for relating various hypotheses about different aspects of language use and language development to wider and deeper coherent explanations, ones that are supported by research findings in several disciplines and not just the explanations within the field of research in which the hypothesis has been framed. This overarching framework allows more precise theoretical anchoring of crucial notions that come up but are not elaborated in the discussion sections of published articles in SLA such as the robustness of data, frequency, activation, working memory, executive control, explicit and implicit knowledge, etc. It is not the only broad-based approach available but it is the one that will be used here (see Sharwood Smith et al. 2013, for a discussion of three alternative approaches).

Space precludes a full account of the MOGUL framework. An initial account was provided in Truscott and Sharwood Smith (2004) and there have been various publications since then (e.g. Truscott and Sharwood Smith 2011; Truscott 2013). Very much more extended accounts may be found in Sharwood Smith and Truscott (2013) and Truscott (forthcoming). Briefly, the framework has the following characteristics which may be stated in the form of assumptions, all of which are familiar from the literature (in cognitive science as well as linguistics *per se*). Firstly, it assumes, briefly, that:

(a) The mind is modular in nature. It consists of semi-autonomous systems, each with its unique processing and storage principles.
(b) These systems are linked in various ways by 'interfaces' that match items with items in adjacent systems to form chains or networks of representations.
(c) Grammatical (phonological and syntactic) knowledge has a special status separate from conceptual knowledge.

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[6] Pienemann's Processability theory incorporates processing concerns into accounts of language development by explaining stages of acquisition as being governed by the relative processability of linguistic constructions. This theory therefore proposes principles that explain differences between one observed developmental stage and the next. This is different from explaining what the precise mechanisms are that are in operation during the on-line processing of L2 at stage 's' that affect a change into stage 's + 1' (Pienemann 1998). Similarly VanPatten's Input Processing theory outlines numerous principles that might explain how the learner's attention is guided to specific aspects of the input. It is not meant to be about L2 parsing or how L2 parsing relates to changes in the learner grammar (VanPattten 2004).

(d) Semantic and pragmatic/discourse knowledge are types of conceptual knowledge.
(e) There is a qualitative distinction between linguistic knowledge that is necessarily subconscious and the kind of knowledge about language that may be made available to conscious awareness.
(f) All cognitive development is driven by on-line processing without the need to postulate special learning mechanisms.

From d and c (above), it may be inferred that 'linguistic knowledge' or 'language' involves more than one mental system and this may be significant with respect to the question of affect. To be more specific, following Jackendoff, there is a domain-specific area within which, respectively, the phonological and syntactic systems are equal partners. This area, unique to humans, is governed by principles usually subsumed under the name Universal Grammar (UG), the nature of which is the subject of much ongoing research projects by no means not all of which share the same theoretical assumptions.

Semantic and pragmatic knowledge, although part of the general notion of 'language', are part of the conceptual system and this is not itself specifically linguistic in nature. In some sense, too, the conceptual system as such can be regarded as not specific to humans although it will be structured in ways that make it radically different from the conceptual system of any other species. It does imply that 'linguistic meaning', whether semantic or pragmatic is not qualitatively different from the meaning to be associated with a visual image or an (non-linguistic) sound.

The way the 'language-specific' (phonology and syntax) areas and the 'language-related' or 'extralinguistic' areas (semantics, etc.) link together is best exemplified by characterising what a lexical entry is. The lexical entry for a word, in these terms, is a chain of structures across different mental systems (see b above). Jackendoff also describes it as "a small-scale three-way interface rule" which shows how chunks of, respectively, phonological, syntactic and conceptual structure "line up" (Jackendoff 2002: 131). Each of these three types of structure are assembled and processed[7] within their own modules according to their own unique principles and therefore cannot be merged together to form one unit. In this case, two of the chunks are located and activated *within* that area specific to language (directly UG-controlled, as it were) and the third one (conceptual structure) is produced *outside it*. Conceptual structures that are related to structures within the language-specific area and are given their special shape through interaction with phonological and syntactic structures share space with other types of conceptual structures, i.e. those that are not directly related to language. For instance, the meanings associated with/kæt/('cat') are encoded in conceptual structure alongside the meanings associated with the sound of a doorbell.

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[7] Jackendoff's architecture can be seen in two ways, statically as a linguistic-theoretical construct, or in psycholinguistic terms, as a processing system. MOGUL opts for the second way. Chains are constructed incrementally and in parallel until the best available match is found.

The distinction referred to above, namely the one between a) the knowledge residing in the two special *linguistic* systems, on the one hand, and b) *conceptual* knowledge (the conceptual system encoded in conceptual structure), on the other, is important for language acquisition theory in another sense. Both phonological and syntactic structures are inaccessible to conscious awareness: the language user can never be aware of the contents of their respective memory stores. By way of contrast, though, conceptual knowledge is in principle available to conscious awareness although access is not direct. That is to say, much of what resides in the conceptual memory store and its connections within and outside the conceptual system remains beyond awareness in any sense but we can, in terms of the MOGUL framework, have indirect access to the contents of the store, when raised into working memory, by using our perceptual systems. It is the perceptual system where conscious experience is created (Sharwood Smith 2004; Truscott in preparation).

This categorisation of two types of knowledge with regard to the possibility of conscious access may be treated as an elaboration, and integration of Krashen's acquisition/learning distinction.[8] It means in practice that the conscious awareness of, inspection and manipulation of syntax and phonology is founded on *conceptual* knowledge alone; this is a type of metalinguistic knowledge that is encoded according to the principles of the conceptual system and is not readable or convertible by either the phonology or the syntax modules, each of which has its one unique and untranslatable code.

7 Affect and Valence in Mogul

The above-mentioned distinction between (purely) linguistic and extralinguistic, i.e. metalinguistic knowledge has some interesting implications for the discussion of affect. It means that, firstly, saying that you, say, really dislike a word or a particular construction in a language (L1 or L2) or indeed dislike the language as a whole, you are referring not only to your conscious feelings (as opposed to your subconscious emotions), but you are also referring to the contents of an essentially *extralinguistic* knowledge source. All metalinguistic knowledge is conceptual in character so that, if you are talking about a specific taboo word for example, you are not talking about the complete structural chain associated with its lexical entry (phonological chunk + syntactic chunk + conceptual chunk); you are talking about only the last chunk, i.e. the metalinguistic concept of a 'word' which we may experience as a single unit. Of course, the whole chain will be automatically activated. Nevertheless, two members of that structural chain, the phonological and the syntactic 'chunk', however strongly activated, will never become current objects of your awareness. Again, where you will surely have subconscious

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[8] Not always, however, with exactly the same implications (Sharwood Smith 2004).

phonological and syntactic knowledge of an L1 or an L2, you may also have a companion extralinguistic (i.e. metalinguistic) grammar, encoded in conceptual structure, for reflecting consciously on its possible make-up. The big question, as originally posed (and answered in his own way) by Krashen, is whether there can be any interaction between the two types of knowledge.

One thing needs to be added to this characterisation of what language knowledge is 'extralinguistic'.[9] This does not only include conceptual knowledge if language but also aspects related to speech sounds. In MOGUL the sound of a word is processed in the auditory system and is not qualitatively different from extralinguistic sound like the sound of a door creaking or a dog barking. The phonological properties of a word are quite distinct from its phonetic/auditory properties and are processed by a separate system. Features of the auditory system, including phonetic ones may also be represented in consciousness.[10] The same goes for orthography which is processed by the visual system, which is again accessible to conscious awareness and very much open to affective marking (valence).

Secondly, this MOGUL-based interpretation gives rise to interesting questions about the source of the inhibiting effect captured by Wu and Thierry (2012) in their experiment on crosslinguistic priming. Where precisely is the emotional valence attached? Fig. 1 shows the two possibilities. Can affect be a) interfaced with the meaning, that is, the conceptual structure of the word and/or its associated auditory (and visual) representations but with neither of the two linguistic systems, or b) can it be interfaced with *all* the structural components of the word chain, that is to say, including the phonological and syntactic components (as indicated by the dotted lines in Fig. 1).

If the second (affective interface) possibility is considered seriously, this would mean that all 'purely linguistic' structure (in MOGUL terms) would admit of valence. This, in turn, would suggest that negative or positive valence would have a direct impact on all aspects of language, that is also on phonological and syntactic acquisition and attrition (growth). If the former possibility is the correct interpretation, then affect would never directly impact on phonological or syntactic structure and these two linguistic systems would never directly trigger any part of the affective system. There would be 'no interface'[11] between the affect system and the purely linguistic system. In the current version of MOGUL, the linguistic systems operate without any consideration of what language the structures they are currently handling; the 'no affective interface' option would suggest that the

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[9] In Sharwood Smith & Truscott (2013) the word 'extramodular' is used with the same meaning signifying 'outside the language module'.

[10] Here, MOGUL appears to differ somewhat from Jackendoff's proposals for whom some basic phonological features may feature in awareness and give rise to the voice in the head (Jackendoff 1987: 291, 2002: 274).

[11] Here I refer to interfaces, not as they appear in the MOGUL framework, but as discussed in Sharwood Smith (1981) and in much more elaborated form as Krashen's (strong/no) 'interface hypothesis' (Krashen 1985). In MOGUL, interfaces have a more precise technical meaning.
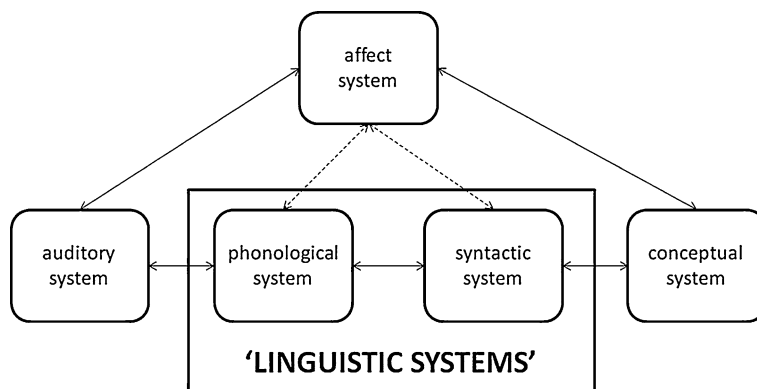
Fig. 1 Affective interface options

linguistic systems are also free of any values. So, for example, if the L2 phonological input to syntax happens to be French but ordered in a way that only fits L1 English syntactic principles as in 'J'aime elle' or 'J'aime la' ('I love her') where the object pronoun coming after the verb as in English should actually *precede* the verb, then there will be no negative valence at this particular point in processing. There may be a delay in syntactic processing but nothing more at that stage. Negative valence, if triggered, will be triggered outside at the auditory or conceptual stage (or both). The implication is also that, if the first interpretation is the correct one, we can only love, or hate the sound of a word or of some longer utterance, or their meanings. As far as abstract phonological and syntactic properties of single words or utterances are concerned, we can only have emotions and feelings about our (metalinguistic) understanding of what we think its abstract phonological or syntactic properties might be, not about those properties themselves. It may be significant that Wu and Thierry (2012) in their study identified the inhibition effect of L1 negatively valenced translation equivalents as a lack of the N400 effect. This, as they point out, is known to reflect lexical–*semantic* integration. In other words, the inhibition is operating extralinguistically on what in MOGUL (and Jackendoff) would be the conceptual system. At the same time, it has to be said that syntax was not tested in this study and research is needed of this subtle type to work out if affect operates at the syntactic and phonological stages of processing.

   If affect (valence) is excluded from the two core linguistic systems, then the growth of phonological and syntactic structure will also be free from the direct influence of either positive or negative emotions. Intense motivation to acquire an L2 grammar, for example, might lead, if the learner is so inclined, to a sophisticated metalinguistic knowledge of that grammar but it can never impact directly on subconscious grammatical growth. The evolutionary advantage of this would be that grammatical growth is, *ceteris paribus*, especially with sufficient exposure to the language, would be guaranteed *despite* negative emotional experiences with it.

Two follow-up questions are then prompted. Firstly, are there *indirect ways* in which negatively valence conceptual and/or auditory structure that is associated with words and constructions might inhibit L1 or L2 grammatical growth? Secondly, since much has been made in the SLA literature of the problems of L2 acquirers developing an L2 up to native levels, how could the AFH be recast as set of working hypotheses in terms of the MOGUL framework? Here, then, is a tentative first attempt. It zeroes in on the status of affect with regard to the purely linguistic systems (phonology and syntax in MOGUL) as opposed to those that have been called here extralinguistic such as the conceptual and the auditory systems. It asks the question, where exactly is the affective filter located?

- *The 'No Affective Interface' Hypothesis* (*NAFH*):

The core linguistic system (phonology and syntax) is immune from direct affective influence.[12] The affective filter effect does not take place within the areas responsible for phonological and syntactic processing. Positive or negative valence can only associate directly with auditory, visual and conceptual structures that are language-related, i.e. only extralinguistically. This implies a different location for affective processing:

(a) facilitation and inhibition may occur directly influencing phonetic, semantic, pragmatic and discourse-related performance and growth;
(b) facilitation and inhibition may occur directly influencing the contextual and situational factors relating to attitudes towards the language and culture.

- *The 'Affective Interface' Hypothesis* (*AFH updated*):

The core linguistic system (phonology and syntax) is *directly open to* affective influence. The affective filter effect *does* take place within the areas responsible for phonological and syntactic processing. Positive or negative valence can also associate directly with both phonological and syntactic structures. With respect specifically to these core linguistic areas, this then implies that:

(a) inhibition of performance and growth can occur irrespective of positive attitudes related to contextual, situational and cultural factor;
(b) facilitation of, specifically, phonological and syntactic performance and growth can occur, irrespective of negative attitudes related to other aspects of the L2, e.g. contextual, situational and cultural factors.

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[12] More technically stated, "no interface exists between affective structures (AfS) and either phonological structures PS or syntactic structures (SS)".

8 Implications for the Acquisition of Grammar

Assuming the AFH is correct, even though you love the target culture and have the warmest feeling for native speakers of that target language, if you have negative feelings about acquiring grammar you should experience delays in phonological and syntactic acquisition. However, if you *dislike* the target culture and its people but simply like learning languages irrespective of who speaks them, your L2 grammatical development should benefit from this positive affect. If the NAFH is correct, then unwillingess to learn or anxiety associated with L2 grammar (syntax and phonology) will not affect grammatical development as long as normal conditions for acquiring an L2 are maintained.

These are all empirical questions of course and require not only a further working out of the precise implications raised by each hypothesis in terms of the framework itself but also the necessary empirical research to be carried out, in some cases with psycholinguistic techniques such as brain imaging, ERPs and measuring skin conductance. The different predictions that may be derived from these hypotheses obviously have to distinguish different underlying causes for observed delays in acquisition. Using this particular theoretical framework to describe possible processing routes for affect prompts the kind of questions just asked, questions that might otherwise not have been asked.

If the NAFH position is well supported by empirical evidence, this would suggest that the original AFH was stated in terms that might wrongly portray the filter as having access to the language acquisition system, i.e. what they called the 'organiser' (Dulay et al. 1982: 46). Assuming repeated exposure to the L2, the sensitivity to grammatical evidence in the linguistic input is in fact *not* influenced by affect directly. If, on the other hand, the second position (AFH) is well supported, this would imply that the psycholinguistic implication of the original AFH was basically correct: negative affect does cause syntactically-based inhibition thereby making learners immediately less sensitive to any linguistic (phonological or syntactic) evidence that can cause their current grammar to move on to the next stage. In Krashen's terms, the organiser itself becomes less efficient and $i + 1$ is rendered obscure.

Other hypotheses about L2 acquisition may each contribute something to the issue of affective influence. For instance, with regard to the age factor, if it turns out that the linguistic system used in L1 acquisition happens to be totally absent or defective in older L2 learners in accordance with the Fundamental Difference Hypothesis for L2 acquisition,[13] then all older learners will be forced to rely more on extralinguistic resources such as explicit, metalinguistic knowledge. Since a) neither the NOFH nor the updated AFH exclude conceptual knowledge from affective influence and since b) metalinguistic knowledge is, by hypothesis,

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[13] This states that older L2 acquirers no longer have access to domain-specific mechanisms constrained by Universal Grammar and must rely on general problem-solving skills (Bley-Vroman 1990).

encoded in conceptual structure, then older learners will be very much more affectively influenced in their learning and use of all aspects of the L2 than their younger counterparts. Other hypotheses may of course suggest different outcomes. Finally, since hypotheses are there to be tested, appropriate research methods would have to be able to tap all these aspect of language ability independently.[14]

9 Conclusion

To conclude, more broadly based theoretical frameworks that derive their principles from more than one discipline enable us to revisit interesting questions raised in the literature and recast them in more precise terms and stimulate new, more specific questions such as 'what does the AFH exactly mean?'. This does not necessarily make the job of the researcher any easier and it also requires a commitment to one or other basic positions on the nature of language in the mind. Nevertheless, it can help to move forward our understanding of issues already discussed at length but with no clear outcome. The original AFH provides just one example of an interesting question that was raised years ago but never really elaborated on for lack of an appropriate framework for doing so.

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[14] As John Truscott (personal communication) has reminded me, one challenge to be faced is how to account, psycholinguistically, for responses in grammaticality judgment tests. If any effect of metalinguistic knowledge can be ruled out, how should we explain the processing of sentences that are judged ungrammatical? An intuitive rejection of an ungrammatical sentence implies negative valence. As with the P600 event-related potential, where is the most plausible location for this valence (within whatever theoretical framework has been selected to guide investigation)?

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It's All in the Eyes: How Language Dominance, Salience, and Context Affect Eye Movements During Idiomatic Language Processing

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Abstract This paper reports an eye movement study and the effects of salience, context, and language dominance on the processing of idiomatic expressions by Spanish–English bilinguals. Salient meanings of figurative expressions are those which are processed first and accessed automatically from the mental lexicon, regardless of contextual bias (Giora 2003). The research conducted so far with second language (L2) learners and bilingual participants has shown that the literal meaning of L2 idioms might be more salient than the figurative one in the course of their processing by non-native language users (e.g. Kecskes 2000; Liontas 2002; Cieślicka 2006; Cieślicka and Heredia 2011). In addition, research findings suggest that the degree of language dominance, or which language is more readily accessible due to usage (Heredia 1997; Heredia and Altarriba 2001; Altarriba and Basnight-Brown 2007), might be a factor in bilingual processing. To investigate whether the degree of literal and figurative activation in bilingual idiom processing may be modulated by language dominance (i.e. dominant vs. nondominant), we recorded eye movements of Spanish–English bilinguals, dominant either in Spanish or in English, while they were reading ambiguous (literally plausible, such as 'kick the bucket') English idioms. Each idiom was used either in its figurative or literal meaning and embedded in a sentence with neutral preceding context, in which case its figurative ('Within seconds she realized she was *in deep water*, and that she would very soon come to regret her words') or literal ('Within seconds she realized she was *in deep water*, and that she would very soon have to swim back towards the shore') meaning became clear due to the subsequent disambiguating information, or the preceding supportive context clearly biasing one of the meanings (e.g. figurative biased: 'Since both of us were equally guilty of causing

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the overspend, we both knew we were *in deep water*, and very likely to lose our jobs'). As predicted, the results indicated that the effects of salience and context on eye movement patterns are modulated by language dominance.

1 Introduction

Eye tracking methodology has been extensively employed to investigate how the language processing system copes with lexical ambiguity resolution by recording eye movements of participants engaged in reading lexically ambiguous material, such as figurative phrases having two plausible (literal and idiomatic) interpretations (e.g. 'kick the bucket' = 'die', or 'strike the pail with one's foot'). The rationale behind applying the eyetracking paradigm to studying lexical ambiguity is that the number of fixations and fixation time on the word reflects the ease or difficulty of processing that word (Cutler 1983).

Given the scarcity of eye movement studies in bilingual language processing, the goal of the present study was to record eye movements of bilinguals reading ambiguous idiomatic expressions. Briefly, idiomatic expressions have been traditionally defined as multi word phrases whose interpretation cannot be derived solely from a compositional analysis of the individual words of the phrase (Swinney and Cutler 1979). Because of their potentially ambiguous nature (i.e. literal vs. figurative senses), idioms can provide a window onto language processing by revealing mechanisms underlying lexical ambiguity resolution in bilinguals.

Previous eyetracking research in idiomatic processing has been mainly conducted with monolingual language users and has mostly focused on the role of context, salience, or different idiom characteristics in the course of on-line idiomatic processing. For example, Titone and Connine (1999) examined the effect of context on eye movement patters in processing idioms varying along the dimension of *compositionality* (Gibbs et al. 1989; Nunberg et al. 1994). While in decomposable idioms, there is a transparent relationship between the idiom's words and components of the idiom's meaning (e.g. 'pop the question', where the noun 'question' quite clearly refers to a 'marriage proposal' and the verb 'pop' to the act of uttering it), figurative meanings of nondecomposable idioms cannot be compositionally derived from the words that comprise the string, as in 'kick the bucket' or 'chew the fat' (Gibbs and Nayak 1989; Gibbs et al. 1989). To determine whether decomposable and nondecomposable idioms are processed differently, Titone and Connine (1999) used sentence contexts biasing either figurative ('She finally *kicked the bucket* after being ill for months') or literal meanings of idiomatic phrases ('She finally *kicked the bucket*, forgetting to move it from the path') and manipulated the position of the idiom in the sentence in such a way that the biasing context either preceded the idiom (e.g. 'Forgetting to move it from the path, she finally *kicked the bucket*'), or followed it ('She finally *kicked the bucket*, forgetting to move it from the path'). The results showed no differences in processing times for decomposable

idioms, regardless of whether context preceded or followed them, and a slower reading time for nondecomposable idioms when the context preceded than when it followed the idiom. Titone and Connine concluded that compositionality significantly affects how idioms are understood. More specifically, since nondecomposable idioms have non-overlapping idiomatic and literal meanings, readers take longer to integrate the meaning compatible with the preceding context as they have to select between two different, active meanings of the phrase. In contrast, individual words of decomposable idioms directly contribute to the idiom's figurative interpretation, and so the two meanings closely overlap without slowing down the processing time, regardless of contextual bias or position in the sentence.

Another aspect of idiom processing investigated with the eyetracking methodology has been the effect of *salience*. Briefly, the *Graded Salience Hypothesis* (Giora 2002, 2003) suggests that salient meanings of figurative expressions are processed and accessed first. The salient meaning of a word or an expression is defined as its "lexicalized meaning, i.e. the meaning retrievable from the mental lexicon rather than from the context" (Giora 1999: 919). According to Giora, such salient meanings are independent of context and they are always processed initially, via direct access in the mental lexicon, immediately upon encounter of the language stimulus. In relation to idioms, the Graded Salience Hypothesis predicts that in the course of processing familiar idioms, whose highly conventionalized figurative meanings are more salient than their literal meanings, figurative meanings will be accessed faster than literal meanings. In contrast, in processing less familiar idioms their literal meaning will be more salient, since for these idioms the figurative meaning is not yet well established in the mental lexicon.

To test the effect of salience on idiomatic processing, Cieślicka et al. (2008) recorded eye movements of native speakers of English presented with idiomatic expressions which were ambiguous with regard to their interpretation; that is, these idioms could be understood both literally or figuratively (e.g. 'a piece of cake'). These conventionalized phrases were used either figuratively (e.g. 'It's not a *piece of cake* for smaller newspapers to maintain a comprehensive Web site featuring fresh news and features') or literally (e.g. 'It's not *a piece of cake*, it's an apple tart, and I'd also appreciate it if you'd bring me the cappuccino I ordered ten minutes ago'). It was assumed, in line with Giora's model, that figurative meanings of those highly conventionalized and familiar expressions are well-established in the native speakers' lexical repertoire and hence are more salient than their alternative, literal interpretations. In addition, a context manipulation was introduced, such that the context preceding the idiomatic expression was either supportive and clearly biased its meaning as figurative (e.g. 'With foolproof instructions from "Homemaker" magazine, home decorating is *a piece of cake*, so that even beginners can produce amazing results') or literal (e.g. 'On Sunday, I went to my uncle's birthday party, but I only ate one *piece of cake* because it was vanilla with chocolate icing and it filled me up') or it was neutral, so that the meaning was disambiguated by the context following the idiomatic phrase

(e.g. 'It's not *a piece of cake*, it's an apple tart, and I'd also appreciate it if you'd bring me the cappuccino I ordered ten minutes ago').

The number and length of fixations on the idiomatic expressions were hypothesized to be a direct function of their salience in such a way that salient, highly conventionalized figurative meanings of the idiomatic phrases were predicted to elicit fewer and shorter fixations than the less salient literal readings of the phrases. Overall, the results indicated a dynamic interaction of both context and salience in affecting the eye reading data. Idiomatic phrases preceded by the supportive context elicited significantly fewer and shorter fixations than those preceded by the neutral context, but nonsalient (literal) meanings were not found any more difficult to process and integrate than salient figurative meanings, contrary to what might be expected based on the graded salience view.

While there is very limited eye tracking research addressing idiom processing in native speakers, eye tracking studies in idiomatic language processing by non-native language users are virtually nonexistent. Those few studies that have been reported so far have mainly focused on whether idiomatic, formulaic language differs from non-formulaic language. More specifically, it has been demonstrated experimental paradigms, using other that idiomatic expressions are understood more efficiently than novel non-formulaic sequences, suggesting that they are stored and processed as single memorized chunks in the mental lexicon and retrieved holistically (Altenberg 1998; Schmitt and Carter 2004; Spöttl and McCarthy 2004; Jiang and Nekrasowa 2007; Conklin and Schmitt 2008). In an eye tracking study investigating this question, Underwood et al. (2004) compared fixation count and fixation durations for native and non-native speakers of English presented with idiomatic expressions and novel non-formulaic sequences. The critical region was the last word of the idiomatic phrase (e.g. 'honesty is the best policy') or its control non-formulaic sentence containing the same lexical item ('it seems that his policy of…'). If idioms are stored as whole phrases and retrieved as a single unit from the mental lexicon then fewer and shorter fixations should be expected on the last idiom word than in cases when the same word is part of a novel, non-formulaic sequence needing to be assembled through the compositional analysis. While this prediction was supported by the native-speaker data, which showed a clear processing advantage for formulaic over non-formulaic phrases, the non-native speaker results were mixed and failed to demonstrate any differences in the duration of fixations on the target words, regardless of whether the words were part of the idiom or a non-formulaic phrase.

In a similar study, Siyanova-Chanturia et al. (2011) presented idioms used figuratively ('at the end of the *day*'—finally), literally ('at the end of the *day*'—in the evening), and novel, non-formulaic phrases ('at the end of the *war*') to native and non-native speakers of English and recorded the number and length of fixations on the whole phrase as well as on the last word of the idiom (e.g. 'day') and its control word in a novel phrase (e.g. 'war'). While native speakers showed a processing advantage for idioms over novel phrases, regardless of whether the idioms were used figuratively or literally, non-native speaker data showed no differences in processing times between idioms and novel phrases, as well as faster processing of

literally than figuratively used idioms, suggesting that literal meaning of idioms might be more salient than figurative ones in non-native processing.

Overall, the limited eye tracking research in the on-line processing of idiomatic expressions has demonstrated that context and salience significantly affect how idioms are understood by native speakers. The few eye movement studies conducted so far with non-native participants have additionally implied that idioms might be processed differently by native and non-native speakers and that literal meanings might be more salient than figurative meanings in non-native idiomatic language processing. This is supported by research with other behavioral paradigms that showed the role of language status (native vs. non-native) in on-line figurative language processing (see e.g. Cieślicka 2006, 2007, 2008, 2010, 2012; Cieślicka et al. 2009; Cieślicka and Heredia 2011).

The present study further explores the role of context and salience in the course of processing English idiomatic expressions by Spanish–English bilinguals varying with regard to their language dominance. Language dominance has been so far largely overlooked in the bilingual idiom processing literature; yet, it might be a crucial factor likely to affect how figurative language is processed. For example, Matlock and Heredia (2002) examined the comprehension of phrasal verbs by monolingual English speakers and Spanish–English bilinguals classified as early or late. Briefly, early bilinguals are individuals learning two languages after three years old, whereas late bilinguals are those individuals who learned their second/foreign language (L2) after already having learned their native language (L1) (Heredia et al. 2007). Participants were asked to determine if a paraphrase of either a literal or figurative interpretation accurately represented the preceding phrasal verb. Early bilinguals were faster in identifying the figurative than the literal interpretation of the phrasal verbs. In contrast, late bilinguals were generally slower and revealed no differences between the literal and figurative readings of the phrasal verbs. Matlock and Heredia (2002) have therefore suggested that idiom processing by late bilinguals would involve: (1) processing the idiomatic expression literally, (2) translating idiom into L1, and (3) identifying idiomatic expression in L1 and accessing its figurative meaning. However, highly proficient L2 speakers or early bilinguals, like monolingual speakers, would have immediate access to the figurative expression.

While proficiency in L2 does not ensure dominance in that language, it is nevertheless a necessary prerequisite, with a bilingual becoming dominant in the language in which he or she is more proficient. For example, Altarriba and Basnight-Brown (2007) and Heredia (1997) have shown that Spanish–English bilinguals who use their L2 more frequently are actually faster in their L2 (see also Heredia and Altarriba 2001), and that their L2 *becomes their actual L1*. So it is possible that the bilingual's L1 can fall in strength while the L2 can become the dominant language (see Heredia and Altarriba 2001; Heredia 2008; Heredia and Brown 2013; see also Schoonbaert et al. 2009). Thus, throughout a bilingual's life, the balance of dominance between languages may shift (Hernández and Kohnert 1999; Meisel 2007). Level of L2 proficiency, in addition to age of L2 acquisition and language exposure, has been identified as one of the variables determining

language representations in the bilingual brain (Vaid and Hall 1991, 2002; Abutalebi et al. 2001, 2005; Perani et al. 2003; Indefrey 2006; Perani and Abutalebi 2005; Stowe and Sabourn 2005; Abutalebi and Green 2007).

In regards to figurative language processing, research conducted so far with late bilinguals has shown that literal meanings of L2 idioms might enjoy a particular prominence in the course of their processing by nonnative language users (e.g. Kecskes 2000; Liontas 2002; Abel 2003; Cieślicka 2006; Cieślicka and Heredia 2011). For example, Cieślicka (2006) employed a cross-modal lexical priming paradigm to explore the on-line processing of English idioms by speakers of Polish who were highly fluent in their L2, English, but dominant in their native language. The study demonstrated prevalence of literal over figurative meaning activation. Faster processing for literally than figuratively used idioms by non-native speakers has also been reported in a recent eyetracking study (Siyanova-Chanturia et al. 2011)

In light of these findings regarding the differential salience status of literal and figurative meanings of L2 idioms in the course of their processing by late bilinguals, the current study looked at whether the activation of literal and figurative meanings of idioms varies as a function of language dominance. Given that figurative meanings of idioms are more salient for dominant language than their literal meanings (Giora 2002, 2003) they should be activated faster when the idiom is meant figuratively than when it is meant literally. On the other hand, if literal meanings enjoy a special salience status in the course of their processing by speakers of a non-dominant language, then bilinguals for whom English is a non-dominant language should process idioms used literally faster than when these idioms are intended figuratively. The logic behind employing the eye-tracking methodology to address questions concerning literal and figurative activation in the course of idiom processing is that the total number of fixations made on critical regions and the durations of these fixations provide an overall indication of differences in the reading dynamics depending on whether an idiomatic expression is used literally or figuratively. If literally used idioms elicit a smaller number and shorter fixations than idioms used figuratively, then it can be deduced that literal meanings of those idioms are more salient (i.e. more readily available) than their figurative meanings.

2 The Present Study

To explore the availability of figurative and literal meanings of idioms, we employed ambiguous idiomatic expressions that were used both figuratively (e.g. 'Ever since one member of our research team resigned and I was asked to take over her responsibilities, I've been *up to my eyes* in work') and literally ('I enjoy the swimming lessons, even though most of the time I'm *up to my eyes* in water'). In addition, following Cieślicka et al. (2008) experiment, a context manipulation was included, such that the context was either supportive or clearly biased the meaning

of the upcoming idiom, as in the two examples above, or it was neutral. In the neutral context condition, part of the sentence following the idiom constituted the disambiguating region, as it biased either the idiom's figurative meaning (e.g. 'I was starting to feel uncomfortable, as I was *up to my eyes* in overdue reports and my boss had just asked me to take over responsibilities of the absent colleague') or its literal meaning (e.g. 'I was starting to feel uncomfortable, as I was *up to my eyes* in unpleasantly cold, muddy water and a long distance from the safety of the shore').

The eye measures recorded were total reading time (the sum of all fixation durations made within a region of interest), fixation count (the number of all fixations made within a region of interest), and regressions (fixations going back to the idiom region). Eye movements were recorded for both the idiom region and the post-idiom region which was the disambiguating part of the sentence when the idiom was preceded by the neutral context. For example, for the sentence 'I was starting to feel uncomfortable, as I was *up to my eyes* in overdue reports and my boss had just asked me to take over responsibilities of the absent colleague', the idiom region was 'up to my eyes' and the post idiom region was 'in overdue reports and my boss had just asked me to take over responsibilities of the absent colleague'.

Overall, context and salience manipulation resulted in the four following conditions: (1) Neutral preceding context, figurative meaning; (2) Neutral preceding context, literal meaning; (3) Supportive preceding context, figurative meaning; (4) Supportive preceding context, literal meaning (see Table 1 for a summary of the four experimental conditions).

2.1 Hypotheses and Predictions

If, as suggested by the previous research, the figurative meaning of the idiom is more salient for the dominant language than its literal meaning, then figurative meaning should be more readily available and activated by default for participants dominant in English. Therefore, when the idiom is embedded in the neutral preceding context but intended literally (Condition 2), we might expect more regressions (re-reading of the target idiom region) and more fixations/longer total

Table 1 Sample stimuli: idiomatic expressions used in each of the four experimental conditions

Neutral preceding context	
1. Figurative meaning	'Within seconds she realized she was *in deep water*, and that she would very soon come to regret her words'
2. Literal meaning	'Within seconds she realized she was *in deep water*, and that she would very soon have to swim back towards the shore'
Supportive preceding context	
3. Figurative meaning	'Since both of us were equally guilty of causing the overspend, we both knew we were *in deep water*, and very likely to lose our jobs'
4. Literal meaning	'Extremely useful for rehabilitation from injury are water workouts, especially running *in deep water* and back floating'

reading time for the post-idiom region than when the idiom is intended in its salient figurative sense (Condition 1). This is expected because in Condition 2 the language processing mechanism will have to cope with incompatible information where the rest of the sentence biasing the literal reading of the idiom fails to match the activated salient (figurative reading).

On the other hand, for bilinguals who are not dominant in English, the literal meaning might be more salient than figurative meaning. If this is indeed the case, then the language processing mechanism is likely to activate this salient literal meaning by default in idioms preceded by the neutral context. Therefore, in contrast to predictions for the dominant language, more regressions to the idiom region and more fixations/longer total reading time for the disambiguating post-idiom region are expected for Condition 1, where the idiom is used figuratively, than for Condition 2, when it is used literally. This is so because in the neutral preceding context the salient (literal) meaning of an English idiom is activated first, so when the rest of the sentence biases its figurative (less salient) reading a conflict arises which incurs an extra processing cost. In addition, in line with the previous research reporting the role of context in idiom processing (e.g. Liontas 2002; Cieślicka et al. 2008), idioms preceded by the supportive context (Conditions 3 and 4) should elicit fewer fixations and shorter total reading time than idioms preceded by the neutral context (Conditions 1 and 2).

Overall, these predictions can be summarized as the following research questions: (1) Will there be a significant effect of context for both figuratively and literally used idioms?; (2) Will the fixation, regression, and total reading time data differ depending on usage: whether idioms are used figuratively or literally?, and (3) Will language dominance affect which meaning (figurative or literal) will be more salient and hence processed faster?

2.2 Method

2.2.1 Participants

The participants were Spanish–English bilinguals dominant in either English or Spanish. A total of 62 fluent bilinguals participated in the study. All participants were undergraduates studying at Texas A&M International University. There were 46 English-dominant bilingual participants and 16 Spanish-dominant bilingual participants. Participants completed a language background questionnaire. Dunn and Fox Tree's (2009) *Bilingual Dominance Scale* was used to determine language dominance.

As revealed by the language questionnaire (see Table 2 for summary), 29 participants reported English as their L1 and 34 participants reported Spanish as their L1. Most of the participants claimed to have learned Spanish and English simultaneously before the age of six. Only 4 participants reported less than 6 years of schooling in English, suggesting that the majority of students have had their

Table 2 Language background questionnaire

Variable	English	Spanish	Other
L1	N = 29	N = 34	
L2	N = 34	N = 29	
Age of acquisition	0–5; N = 46	0–5; N = 57	
	6–10; N = 10	6–10; N = 2	
	11–15; N = 6	11–15; N = 2	
	16–20; N = 1	16–20; N = 1	
Years of schooling in language	0–5; N = 4	0–5; N = 37	
	6–10; N = 14	6–10; N = 9	
	11–15; N = 25	11–15; N = 10	
	16–23; N = 19	16–20; N = 5	
	20–25; N = 2		
Place of residence where language is spoken	N = 43	N = 37	
Language more comfortable speaking	N = 46	N = 27	Spanglish; N = 12 Neither; N = 1
Language more comfortable reading	N = 48	N = 5	Both; N = 14

education in English speaking institutions. A comparable number of participants reported residing in an English-speaking region (N = 43) and in a Spanish-speaking region (N = 37), as might be expected given the fact that TAMIU is located in a city bordering Mexico.

2.2.2 Materials

Following the typology of idioms developed by Alexander (1991), a broad range of idiomatic stimuli were used in the experiment. There were 32 different idioms in total. These included phrases (e.g. 'in deep water', 'cup of tea'), semi-clauses and full clauses (e.g. 'sweep under the carpet', 'get off the ground'), phrasal compounds (e.g. 'night owl', 'red tape'), Verb (+ Determiner) + Noun combinations (e.g. 'draw the line', 'burn bridges'), and phrasal verb idioms (e.g. 'rip off', 'put down').

The stimuli were matched on a number of characteristics, such as idiom familiarity, word frequency, idiom compositionality (the degree to which the meaning of the idiom can be seen as a sum of the meanings of its component parts), transparency (the degree to which figurative meaning of the idiom can be deduced from its literal interpretation), and idiom predictability (the degree to which, given the first word or the first few words of the idiom, its idiomatic interpretation becomes immediately accessible). All of those characteristics have been shown to crucially affect the speed of idiom recognition (e.g. Titone and Connine 1994; Heredia and Cieślicka 2008). Titone and Connine's (1994)

published norms from English monolinguals which were first normed with Spanish–English/English–Spanish bilinguals from the Psychology subject pool at Texas A&M International University (see Heredia and Cieślicka 2008).

Each idiom was used either in its figurative or literal meaning. In addition, when used both figuratively and literally, each idiom was either embedded in a sentence with the neutral preceding context or rich supportive context clearly biasing one of the meanings (see Table 1). Each idiom was thus used in four different conditions, for the total number of 128 idiomatic sentences. The sentences were normed in a pretest, in which 20 native speakers of English were asked to read each of them and decide if the idioms were meant literally or figuratively, as well as to evaluate whether the context in which they were embedded was indeed neutral or literal/figurative-biased. Care was taken to ensure that the neutral context preceding an idiom used figuratively and literally was identical.

Four lists were created, in which each idiom only occurred in one of the four conditions, so that the participants were not presented with the same idiom twice. Each list contained 32 idiomatic sentences and 68 filler sentences, presented in a randomized order for each participant. Also included in the lists were YES/NO comprehension questions referring to the sentence that preceded it. The questions were randomly presented to ensure that participants comprehended the sentences they were instructed to read.

2.2.3 Apparatus and Procedure

The data were acquired using the Eye-Link 1000 tower mounted system, with a sampling rate of 1 kHz. Eye movements were recorded from the right eye only. Based on Latin Square counterbalancing, participants were assigned to one of four lists. At the beginning of the session, the participants were asked to complete the Language Background Questionnaire. They were next directed to the Eye-Link computer, seated approximately 60 cm from the monitor and had their head supported by a chin rest to minimize head movements. The participants were instructed to read the sentences displayed on the computer screen and to answer YES/NO questions pertaining to the sentences by pressing the designated buttons on a Microsoft game controller device. Following the calibration procedure, the experimental session started, which included 12 practice trials to ensure that participants became familiar with the experimental procedure. At the beginning of each trial, participants focused on a fixation point that appeared against a white background towards the left of the screen. Once they fixated on the black dot, they were asked to press a button on a Microsoft game controller device in order to trigger sentence presentation. When they finished reading the sentence and were ready for the next trial, they had to press the same button again to trigger the display of the fixation point and the new sentence.

After the end of the experiment, all participants rated their familiarity with the idiomatic expressions used in the study. They were presented with each idiom accompanied by a 5-point Likert scale, ranging from 1—totally unfamiliar to

5—completely familiar. Only the idioms with the rating above 4.0 were included in the data analysis for a given participant. The data pertaining to idioms that were not known (overall 2 %) were removed.

2.3 Results

Data were first inspected for accuracy of the responses provided by the participants to the YES/NO comprehension questions. All participants met the criterion of 90% accuracy. The data were analyzed in terms of the total reading time and fixation count for the idiom region and the post-idiom region, as well as in terms of regressions to the idiom region. The design conformed to mixed factorial with language dominance (English- vs. Spanish-dominant) as a between-subject factor, and idiom usage (figurative vs. literal) and context (neutral vs. supportive) as within-subject factors, and subjects and items as random variables.

2.3.1 Total Reading Time

Mixed linear analysis of the total reading time on the idiom region revealed a significant main effect of language (i.e., Spanish vs. English), $F(1, 52) = 4.68$; $p < 0.05$; a significant main effect of context, $F(1, 52) = 7.02$; $p < 0.01$ and a significant interaction between language dominance and idiom usage, $F(1, 52) = 3.49$; $p < 0.1$ (see Table 3 and Fig. 1). No other effects were significant. As can be seen in Table 3, the total reading time for the idiom region was significantly shorter for English-dominant (549 ms for figuratively and 529 ms for literally used idioms) than for Spanish-dominant bilinguals (627 ms for figuratively and 624 ms for literally used idioms) in the neutral context condition. This suggests that bilinguals are indeed faster in recognizing idiomatic expressions in the dominant than the nondominant language. In addition, the total reading time for the idiom region was significantly shorter when idioms were preceded by the supportive than neutral context for both English- and Spanish-dominant participants, suggesting that context plays a crucial role in idiomatic language processing, regardless of language dominance.

Results for the post-idiom region showed a significant main effect of language dominance, $F(1, 52) = 8.42$; $p < 0.05$, a significant main effect of context, $F(1, 52) = 2.61$; $p < 0.05$, and a significant main effect of idiom usage, $F(1, 52) = 9.69$; $p < 0.001$ (see Table 3 and Fig. 1). It should be noted that total reading times on the post-idiom region were calculated as averages per character, since the region varied in length for each sentence. Overall, total reading time for the post-idiom region was significantly shorter for English- than Spanish-dominant bilinguals in all conditions. In addition, for English-dominant bilinguals there was a trend towards significance for the post-idiom region to have shorter total reading times when idioms were embedded in the supportive context and used in their figurative meaning (49 ms)

Table 3 Mean total reading time for the idiom region and post-idiom region, averaged per character, for English-dominant and Spanish-dominant bilinguals. Standard errors are provided in parentheses

Language dominance	Area of interest	Total reading time			
		Context			
		Supportive		Neutral	
		Usage		Usage	
		Figurative	Literal	Figurative	Literal
English	Idiom region	495 (146)	510 (135)	549 (134)	529 (146)
	Post-idiom region	45 (2.53)	49(2.56)	50 (2.20)	50 (1.95)
Spanish	Idiom region	492 (83)	616 (172)	627 (248)	624 (145)
	Post-idiom region	56 (5.27)	62 (7.55)	66 (6.28)	64 (7.33)

than in their literal meaning (49 ms), suggesting that figurative meaning was more salient for English-dominant readers. On the other hand, Spanish-dominant bilinguals had shorter reading times on the post-idiom region when idioms were preceded by the neutral context and used literally (64 ms) than figuratively (66 ms), suggesting that literal meanings might be more salient and readily available when processing idioms in non-dominant language. However, this effect was not consistent for Spanish-dominant bilinguals, as in the supportive preceding context the reverse was found, with shorter reading times for the post-idiom region when idioms were used figuratively (56 ms) than literally (62 ms).

2.3.2 Fixation Count

No significant main effects or interactions were found in the fixation count data for the idiom region. However, when run for the post-idiom region, mixed linear analysis on the fixation data revealed a significant main effect of context, $F(1, 150) = 32.05$; $p < 0.0001$, a marginally significant two-way interaction between context and language, $F(1, 150) = 2.87$; $p = 0.6$, as well as a marginally significant three-way interaction between language, context, and usage, $F(1, 1, 515) = 3.16$; $p = 0.7$ (see Table 4 and Fig. 2 for summary).

As shown in Table 4, regardless of language dominance, there were significantly fewer fixations on the post-idiom region when the idioms were preceded by the supportive than neutral context. This effect held true for idioms used both literally and figuratively, suggesting a powerful role of context in figurative language processing and confirming the results obtained for the total reading time measure. Multiple comparisons using the Least Significant Difference (LSD) revealed that English dominant bilinguals fixated significantly less on the post-idiom region in the neutral preceding context when the idiom was used figuratively (0.33) than Spanish bilinguals (0.42), suggesting that the figurative meaning was more easily retrievable and more salient for the bilinguals dominant in English.

Total reading time on the idiom region for
English-dominant bilinguals

Total reading time on the idiom region for
Spanish-dominant bilinguals

Total reading time on the post-idiom region for
English-dominant bilinguals (averaged per
character)

Total reading time on the post-idiom region for
Spanish-dominant bilinguals (averaged per
character)
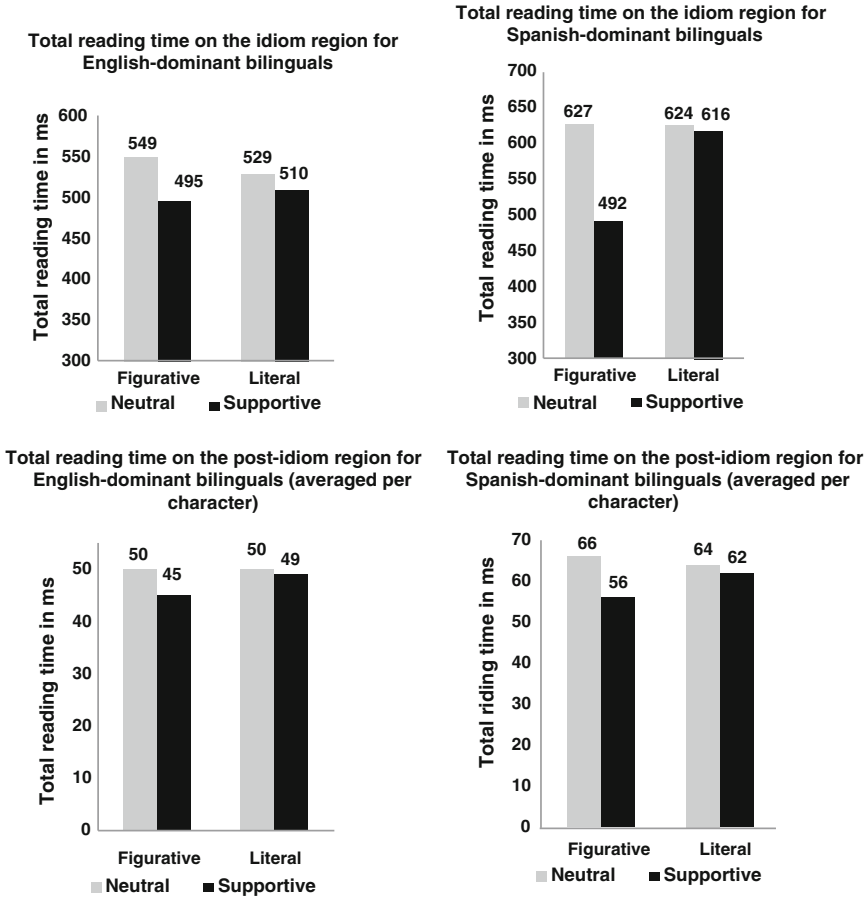
Fig. 1 Mean total reading time for the idiom region (*top panel*) and post-idiom region (*bottom panel*) for English-dominant and Spanish-dominant bilinguals

2.3.3 Regressions

Regression data analysis showed a significant main effect of context, $F(1, 398) = 8.1$; $p < 0.01$ and a significant interaction between context and usage, $F(1, 398) = 8.1$; $p < 0.05$. Mean number of regressions to the idiom region for idioms used in the four conditions is summarized in Table 5 (see also Fig. 3).

Both Spanish- and English-dominant bilinguals had significantly fewer regressions when the idioms were used in the supportive than in the neutral context, but only when they were meant figuratively. In addition, Spanish-dominant bilinguals showed significantly fewer regressions to the idiom region in the neutral preceding context when the idiom was used literally (1.12) than

Table 4 Mean fixation count for the idiom region and post-idiom region, averaged per character, for English-dominant and Spanish-dominant bilinguals. Standard errors are provided in parentheses

Language dominance	Area of interest	Fixation count				
		Context				
		Supportive		Neutral		
		Usage		Usage		
		Figurative	Literal	Figurative	Literal	
English	Idiom region	3.7 (0.18)	3.7 (0.16)	4.5 (0.24)	4.6 (0.20)	
	Post-idiom region	0.19 (0.02)	0.23 (0.02)	0.33 (0.02)	0.34 (0.02)	
Spanish	Idiom region	4.2 (0.35)	4.2 (0.34)	4.9 (0.60)	5 (0.54)	
	Post-idiom region	0.22 (0.03)	0.28 (0.03)	0.42 (0.03)	0.35 (0.03)	

figuratively (1.47), suggesting that the literal meaning of the English idioms was easier to process and thus more salient for the bilinguals who were less proficient in English.

3 Discussion and Conclusions

In this study, we looked at the effects of context, salience, and language dominance on the on-line processing of English idiomatic expressions by Spanish-dominant and English-dominant bilinguals. To determine how these factors influence idiomatic processing, we measured eye movements of bilingual participants while they read idioms used in their literal or figurative meaning and preceded either by the rich supportive context clearly biasing their meaning or by a neutral context. The eye measures recorded were the number of fixations and total reading for both the idiom and post-idiom regions, as well as regressions (i.e. regressive fixations from the post-idiom to the idiom region). Our research questions asked whether there would be a significant effect of context for both figuratively and literally used idioms, whether eye measures would differ depending on whether the idioms are used figuratively or literally, and whether language dominance would affect which meaning (figurative or literal) is more salient and hence processed faster.

Overall, all the three factors (context, salience, and language dominance) were found to significantly affect idiom processing and our predictions were mostly supported. Context was significant in all the reading measures and strongly affected idiom processing regardless of language dominance. More specifically, total reading time for the idiom region was significantly shorter when the idioms were embedded in the supportive than in neutral context. This effect was obtained for idioms used figuratively and for both Spanish- and English-dominant participants. Similarly, fixation count data for the post-idiom region showed that there were significantly fewer fixations for the sentences where the idioms were
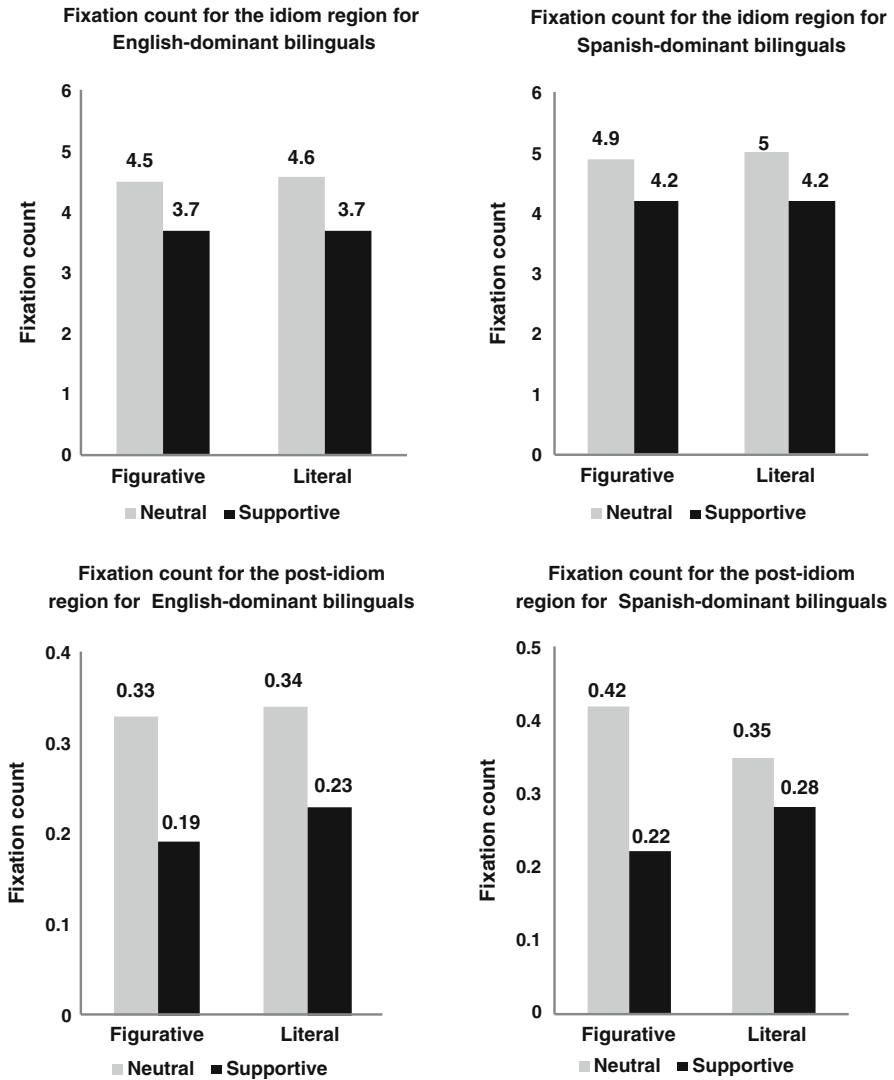
Fig. 2 Mean fixation count on the idiom region and post-idiom region for English-dominant and Spanish-dominant bilinguals

preceded by the supportive than by neutral context. This effect held true regardless of idiom usage, suggesting that a rich supportive context biasing the less frequent, literal reading of the idiomatic expression can successfully speed up its comprehension, even if the meaning is less salient. Finally, context effects were also revealed in the regression data, as fewer regressions were made to the idiom region in the supportive than in the neutral context, for both Spanish- and English-dominant participants.

Table 5 Mean number of regressions to the idiom region for English-dominant and Spanish-dominant bilinguals. Standard error is provided in parentheses

Language dominance	Area of interest	Regressions			
		Context			
		Supportive		Neutral	
		Usage		Usage	
		Figurative	Literal	Figurative	Literal
English	Idiom region	1.10 (0.06)	1.14 (0.06)	1.37 (0.06)	1.26 (0.05)
Spanish	Idiom region	1.06 (0.14)	1.18 (0.10)	1.47 (0.11)	1.12 (0.10)
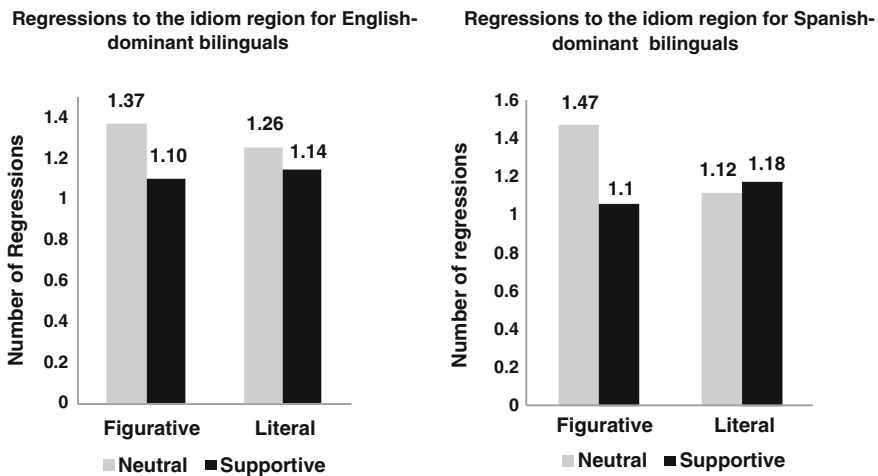
Fig. 3 Mean number of regressions to the idiom region for English-dominant and Spanish-dominant bilinguals

Language dominance clearly plays a significant role in figurative language processing, as suggested by Matlock and Heredia (2002). Total reading time for the idiom region and post-idiom region was significantly shorter for English- than for Spanish-dominant bilinguals. This suggests that English stimuli were easier to process as a function of participants' dominance in that language. Moreover, language dominance dynamically interacted with salience and context, affecting the speed of processing of the idiomatic expressions used literally and figuratively. In line with the previous literature suggesting that less proficient bilinguals might process literal meanings of L2 idioms faster than figurative meanings (Kecskes 2000; Liontas 2002; Abel 2003; Cieślicka 2006; Cieślicka and Heredia 2011), we expected to find fewer fixations and shorter readings times for literally than for figuratively used idioms in Spanish-dominant bilinguals. Conversely, English-dominant bilinguals were expected to produce data compatible with those reported for English monolingual speakers in the previous literature and show preference

for figuratively over literally used idioms, as figurative meanings are well established in their mental lexicons (Giora 1999, 2002, 2003).

Overall, we found evidence of literal salience preference for Spanish-dominant vs. English-dominant bilinguals; however, the effect was not consistent across all conditions. Similarly, the results for English-dominant bilinguals are partially compatible with the Graded Salience Hypothesis, showing that the figurative meanings of idioms were at times more easily available than literal ones, but again this effect did not hold true for all conditions and was only present in the total reading time and fixation data recorded for the post-idiom region. For example, as predicted, total reading time for the post-idiom region was shorter for English-dominant bilinguals when the idioms were used figuratively rather than literally, which implies that the figurative meanings were more salient and thus easier to process. On the other hand, for Spanish-dominant bilinguals total reading time for the post-idiom region was shorter when the idioms were used literally rather than figuratively and preceded by the neutral context. This implies that for those bilinguals it was the literal meaning of an idiomatic expression that got activated by default when no biasing context was present. When the following disambiguating context was consistent with the activated literal reading, it took shorter to process. In case when the following context biased the figurative reading of the idiom, the language processing mechanism had to suppress the literal meaning activated earlier and to resolve the inconsistency by reinterpreting the idiom figuratively. However, the results for Spanish–English bilinguals were inconsistent in the supportive context, where the reverse was found to be true, namely shorter reading times for the post-idiom region when the idioms were used figuratively rather than literally.

Differences in figurative and literal processing as a function of language dominance were also found in the fixation count data for the post-idiom region. Here, fewer fixations were recorded for figuratively used idioms in English-dominant than Spanish-dominant bilinguals, which would again imply that the figurative meanings of English idioms are more readily available (i.e. more salient) for bilinguals dominant in that language. Finally, the regression data also showed a dissociation between the salience status for the figurative and literal idiom readings as a function of language dominance. While there was no difference between regressions for figuratively and literally used idioms in English-dominant bilinguals, Spanish-dominant bilinguals had significantly fewer regressions when the idiom was used literally rather than figuratively.

The current data are broadly compatible with the limited bilingual figurative eye-processing literature. Similar to Siyanova-Chanturia et al. (2011), we found a difference in idiom processing as a function of the language status. As argued before, Siyanova-Chanturia et al. (2011) looked at the differences between idiom processing in native and non-native speakers of English. The study showed a processing advantage for idioms over novel phrases only for native speakers, suggesting that those expressions are retrieved holistically from the mental lexicon for L1 language users. For non-native speakers, there were no differences in processing times between idioms and novel phrases, which would imply that less

proficient L2 users have to process those expressions in a fashion similar to processing novel non-formulaic sequences, through the compositional analysis of each word. While we did not specifically compare idiom processing to non-idiomatic phrases, our study also showed faster and more efficient retrieval of idioms for more proficient speakers (English-dominant bilinguals) than less proficient ones (Spanish-dominant bilinguals).

Similar to Siyanova-Chanturia et al.'s (2011) results, which showed faster processing of literally than figuratively used idioms in non-native speakers, our data also revealed that the literal meanings of the idiomatic phrases were activated faster in less proficient, Spanish-dominant participants, further confirming the findings reported in the previous literature concerning literal salience preference for late bilinguals and L2 users (e.g. Kecskes 2000; Liontas 2002; Abel 2003; Cieślicka 2006; Cieślicka and Heredia 2011). As mentioned earlier, our eye movement data for the idiom region for English-dominant bilinguals showed no differences in the number and duration of fixations for idioms used either figuratively or literally. These results are also consistent with Siyanova-Chanturia et al.'s (2011) study where processing times for idioms did not differ significantly, regardless of whether idioms were meant figuratively or literally.

The data pertaining to the role of context obtained in the current study further extend the findings of Cieślicka et al. (2008), where native speakers of English had significantly fewer and shorter fixations on the idioms preceded by the supportive rather than the neutral context. The current study also showed a robust effect of context, regardless of whether the idioms were used literally or figuratively and regardless of language dominance. The present findings are inconsistent with the eye tracking study conducted by Titone and Connine (1999) who found no differences in decomposable idiom processing, regardless of whether the context preceded or followed them and a slower processing times for nondecomposable idioms preceded by the supportive than by the neutral context. However, we did not look at the dimension of compositionality and our idioms were all matched along this characteristic, and therefore it is difficult to make a direct comparison.

Overall, the eye tracking study reported here confirms the findings from previous research conducted with different behavioral paradigms that have demonstrated the complexity of figurative language processing in bilingual participants. It seems that many different factors affect on-line comprehension of idiomatic phrases in bilingual language users and that additional eye tracking research is needed to fully capture the intricacies of bilingual figurative processing.

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The Critical Period Hypothesis for Second Language Acquisition: Tailoring the Coat of Many Colors

David Birdsong

Abstract The present contribution represents an extension of David Singleton's (2005) *IRAL* chapter, "The Critical Period Hypothesis: A coat of many colours". I suggest that the CPH in its application to L2 acquisition could benefit from methodological and theoretical tailoring with respect to: the shape of the function that relates age of acquisition to proficiency, the use of nativelikeness for falsification of the CPH, and the framing of predictors of L2 attainment.

1 Introduction

David Singleton's (2005) study, "The Critical Period Hypothesis: A coat of many colors", is the second most-cited article ever to appear in *International Review of Applied Linguistics in Language Teaching*. At its core, the piece is a critique of the Critical Period Hypothesis (CPH) as it has been applied in the context of second language acquisition (L2A). Singleton argues that, as an account of constraints on L2A attainment, the CPH is underspecified in the literature. Crystallizing the sometimes vague and decidedly diverse positions advanced by researchers in the CPH tradition, Singleton (2005: 280) writes: "For some reason, the language acquiring capacity, or some aspect or aspects thereof, is operative only for a maturational period which ends some time between perinatality and puberty".

With respect to the notion of 'period', Singleton notes that various researchers have pegged the end of the CP for phonetics/phonology at ages ranging from one year to puberty. As for the affected language learning capacities, Singleton's review of the literature reveals that CP researchers have put forth accounts of deficits in: general language learning ability, non-innate linguistic features, innate

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linguistic features, specific subparts of innate features, and implicitly acquired linguistic features. As concerns the underlying sources of CP effects, Singleton's survey tallies six accounts of a neurobiological nature, four in terms of cognitive development, and four relating to affect and motivation.

Singleton (2005: 280) characterizes with trademark pithiness his notion of 'the manifoldness' of the CPH:

> My conclusion from this exploration is that the CPH cannot plausibly be regarded as a scientific hypothesis either in the strict Popperian sense of something which can be falsified (see, e.g. Popper 1959) or indeed in the rather looser logical positivist sense of something that can be clearly confirmed or supported (see, e.g. Ayer 1959). As it stands it is like the mythical hydra, whose multiplicity of heads and capacity to produce new heads rendered it impossible to deal with.

From Singleton's perspectives on the CPH/L2A, "a coat of many colors" is indeed an apt metaphor.

The present contribution piggybacks on Singleton's work, taking complementary perspectives on mainstream research conducted in service of the CPH/L2A. Adding a fitting metaphor to Singleton's original title, I attempt to show that the coat of many colors might warrant some methodological and theoretical tailoring to accommodate the facts and phenomena associated with age and attainment in L2A.

2 What Critical Periods Look Like

To make a case for a CP in the L2 context, it does not suffice to demonstrate that age of onset of L2 learning (often referred to as *age of acquisition* or *AoA*) and ultimate L2 attainment are related. To qualify as a period, the geometry of the function relating AoA to performance (usually characterized in terms of linguistic proficiency or processing ability) should contain a slope that is bounded at some points along the function.

Many studies have found AoA effects over the full span of AoA's, suggesting unbounded functions (Birdsong 2005). Conversely, non-linearities or inflections in the AoA-attainment function have been interpreted as suggestive of a period, in the sense that changes in slope would mean that AoA-related effects are bounded (Hakuta et al. 2003; Stevens 2004). The logic here is that a significant slope change would be consistent with a qualitative change in sensitivity of the learning mechanism. To suggest that maturational effects are at play, the changes in slope should line up with recognized developmental milestones that are uncontroversially maturational in nature.

In this context, Birdsong and Molis (2001) reanalyzed the L2 proficiency data from Johnson and Newport's (1989) study of Korean and Chinese learners of L2 English. Using a piecewise linear regression model, the reanalysis placed the breakpoint in Johnson and Newport's AoA-proficiency slope at 18 years, i.e. at an AoA beyond puberty. Similarly, Vanhove (2013) applied piecewise regression

analyses to DeKeyser et al.'s (2010) data from Russian immigrants learning L2 English in North America and L2 Hebrew in Israel. Vanhove's reanalysis of DeKeyser et al.'s Hebrew grammaticality judgment results revealed that including an inflection point in the AoA-attainment function did not result in a better fit than a simple linear regression model. In other words, AoA effects were best modeled as a straight-line function, across the full range of AoA. The reanalysis of the English grammaticality judgment results revealed that a model with a breakpoint at around AoA = 16 was a marginal improvement over a simple linear model. However, like the Hebrew data, the slope of the function after AoA = 16 did not flatten, i.e. a decline in performance continued throughout adult AoA.

Vanhove's study suggests that piecewise regression models, which have been used only infrequently in L2 attainment studies, are appropriate for determining whether the timing and geometry of the AoA-attainment function conform to assumptions of what a CP should look like.[1] Made-to-measure analytical methods may be required to suitably fit the coat to the function.

3 Nativelikeness and the CPH/L2A

Long (1990) stipulates that the way to falsify the CPH in the L2A context would be to find a single late learner who is indistinguishable from an adult monolingual native. The operational logic goes something like this: the absence of observed nativelikeness is due to maturational factors, and nativelikeness can disconfirm the CPH/L2A.

On a complementary view of non-nativelikeness, many researchers point out that non-monolingual-likeness in both the L1 and the L2 is a defining characteristic of bilingualism (early and late) (for a review, see Ortega 2009: 26–27). For example, VOT values of the L1 may extend toward those of the L2, just as VOT values of the L2 may extend toward those of the L1 (see e.g. Fowler et al. 2008). Among bilinguals, effects of maturation (in the sense of biologically determined declines in learning ability) cannot straightforwardly explain the fact that syntax, lexicon, and phonology of the *L1* are altered in bilingualism, and have features reflecting contact with and use of the L2 (see e.g. Cook 2003). Non-monolingual-nativelikeness in the

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[1] Granena and Long (2013) applied multiple linear regression analyses to the relationship of Chinese natives' AoA to their attainment in L2 Spanish morphosyntax, phonology, and lexis and collocation. For each of these three linguistic domains, including breakpoints in the model revealed a small (5 %) but statistically significant increase in variance accounted for, as compared to the variance accounted for in a model with no breakpoints. According to the authors, the fact that the improvement was so small "could mean that the less complex (i.e. more parsimonious) model with no breakpoints is already a good enough fit to the data or, alternatively, that a larger sample size is needed to compensate for the loss of degrees of freedom and to minimize the risk of overfitting" (2013: 326–327).

L1 of bilinguals cannot be due to maturationally induced impairment of a presumed language learning mechanism, inasmuch as the L1 has been fully acquired, before the end of maturation.

Arguably, the fact that the L1 can be influenced by the L2 in adulthood is evidence for maturationally conditioned representational *plasticity*. In other words, non-monolingual nativelikeness in the L1 is suggestive of a capacity to learn language in adulthood. For example, 'speaking with an accent in the native language' is common among immigrants returning to their homeland for visits, as are noticeable changes of accent among individuals who move across dialect boundaries within a single country. Such permeability of the L1 would not be possible if the neural systems underlying phonetic perception and production were not plastic. To fully clothe the big-picture facts about late L2 and late L1 learning, the CPH/L2A coat might benefit from some broadening through the shoulders.

4 Scrutiny Across the Board

According to Long (1990) and Hyltenstam and colleagues (e.g. Hyltenstam and Abrahamsson 2003; Abrahamsson and Hyltenstam 2009), there are two key elements of the linkage of nativelikeness to the CPH/L2A. One is the requirement that the nativelikeness in the L2 must be observed 'across the board', that is, with respect to all L2 linguistic features and processes, for it to be sufficient to falsify the CPH. The other is that the evidence for (non)-nativelikeness (be it, presumably, behavioral or brain-based) should be uncovered from close scientific scrutiny, lest some evidence be overlooked. Thus, on this view, an individual who appears nativelike to the casual observer or on coarse or too-easy performance measures is insufficient evidence for rejecting the CPH. In sum, falsification of the CPH/L2A would require 'scrutinized nativelikeness' (Abrahamsson and Hyltenstam 2009) on a comprehensive set of linguistic measures.

There is a sensible rationale for psycholinguists to look beyond what is noticed by the untrained ear. With sensitive measures, our understanding of linguistic behaviors—especially inter-group and inter-individual differences—is enhanced. In the L2 context, as in scientific inquiry generally, the precision of information available from granular observation is valuable and welcome. From this perspective, there is no argument with scrutiny. The concern is with the application of evidence for non-nativelikeness—be it obtained by scrutiny or by any other methodological orientation—to theory. Monolingual-bilingual differences are inevitable, and more differences are sure to emerge from challenging tasks and fine-grained analyses than from simple tasks and coarse analyses. But it is not clear that non-monolingual-like behaviors and brain functions are decisive for CPH/L2A theory. Given what is known about reciprocal L1-L2 influences in bilinguals' behaviors, evidence for non-nativelikeness—be it detected on the street or under microscopic examination, be it present in outer patches or inner pockets, in bolts of cloth or in buttonholes—does not compel, uniquely, a maturational explanation.

And so it is with across the board nativelikeness. Since bilinguals are not like monolinguals in either of their languages, it is hard to argue that comprehensive nativelikeness, scrutinized or not, should be held up as the gold standard for falsifying the CPH/L2A.

   If the idea is to look around for non-nativelikeness in bilingualism, then non-nativelikeness will eventually be found. If the follow-on idea is to stipulate that across-the-board nativelikeness is what is required to disconfirm the CPH, then the CPH is invulnerable to falsification. This being the case, the coat would need some letting out in the chest to accommodate the Kevlar vest underneath.

5 Framing the Issues

A study by DeKeyser (2000), entitled "The robustness of critical period effects in second language acquisition", investigates the roles of factors such as AoA, language learning aptitude, and years of schooling in predicting L2 English grammaticality judgment (GJ) accuracy by 57 Hungarian immigrants to the US. A look at each of these factors in turn is revealing.

- *AoA*. For all participants, AoA was predictive ($r = -0.63$, $p < 0.001$). On the other hand, breakout correlations with groups divided by early arrivals (AoA < 16; n = 15; $r = -0.26$ ns), and late arrivals (AoA 17–40; n = 42; $r = -0.04$ ns), revealed no significant declines at either pre- maturational or post-maturational AoA epochs. Thus, definitional evidence for a critical period, in the form of pre-maturational declines in proficiency, is not found. DeKeyser acknowledges this failure to replicate the pre-maturational AoA effects observed by Johnson and Newport (1989) (the items used in DeKeyser's grammaticality judgment task were a slightly modified subset of those used by Johnson and Newport). DeKeyser considers this discrepancy "hard to interpret" (2000: 513), and goes on to develop an explanation based on putative artifacts of sampling (2000: 514).
- *Aptitude*. DeKeyser administered to all participants a Hungarian-language adaptation of Carroll and Sapon's (Carroll and Sapon 1959) *Modern Language Aptitude Test*. The average aptitude score of all participants was a low 4.7 out of a possible 20. DeKeyser divided the 57 participants into a high aptitude group (n = 15) whose aptitude scores were 6 or higher, and an average- or low-aptitude group consisting of 42 participants. To clarify, the 15- and 42-participant breakouts for high aptitude and average/low aptitude, respectively, were not the same participants as the groups of 15 early arrivals and 42 late arrivals. Across all 57 participants, aptitude was not predictive of GJ scores ($r = 0.13$ ns). The reported correlation of aptitude with GJ scores for early arrivals was not significant either ($r = 0.07$ ns). However, for late arrivals, a significant positive correlation of aptitude and GJ scores was observed ($r = 0.33$, $p < 0.05$). DeKeyser had predicted that adult learners would not

score within the range of early AoA participants unless they had high language learning aptitude. The combination of: a significant positive correlation of aptitude and performance among late arrivals, a non-significant correlation of aptitude and performance for early learners, the performance near ceiling of early learners, and an examination of 5 (of 6) higher-aptitude late learners whose GJ scores were within the range of early learners, leads DeKeyser to the following generalization: "Whereas the younger acquirers in the present study all reached a native or near-native level regardless of aptitude, only the adults with above average aptitude eventually became near native" (2000: 515). "Aptitude plays a role for adult learners" (2000: 515) in the sense that, on L2 proficiency measures, high aptitude trumps, or compensates for, high AoA. Thus, the basting that sews together the AoA variable and proficiency is the interaction of AoA and an additional learner variable, language learning aptitude: aptitude conditions performance among late learners, but not among early learners. This is a notable finding, to the extent that its interpretation allows for rationalization of high GJ scores among late learners. However, what is also notable, and what the DeKeyser study does not adequately investigate in its data, is a clear-cut set of relationships involving the education variable.

- *Years of schooling.* With the data provided in Appendix A of the DeKeyser chapter, I conducted correlations of years of schooling with performance on the grammaticality judgment task. I found that, over all AoA (n = 57), years of schooling significantly correlate with grammatical proficiency ($r = 0.45$, $p < 0.001$). Education also predicts GJ scores among late learners (n = 42; $r = 0.51$, $p < 0.01$) as well as among early arrivals (n = 15; $r = 0.78$, $p < 0.001$).[2] With learners separated into aptitude groups, my analysis reveals that education is again predictive of proficiency. For the 15 high aptitude participants, years of schooling correlate significantly with GJ scores ($r = 0.564$, $p < 0.05$). Likewise, for the 42 low- to average-aptitude participants, education predicts proficiency ($r = 0.43$, $p < 0.01$). Meanwhile, education and aptitude are not correlated over all AoA ($r = 0.03$ ns), nor among early arrivals ($r = 0.006$ ns), nor among late arrivals ($r = 0.08$ ns), suggesting the independent contributions of education and aptitude. To summarize, years of schooling predict GJ results across all relevant correlations. Importantly, unlike AoA and unlike aptitude, the 'education effect' is systematic: significant correlations are not restricted to certain AoA spans or certain aptitude levels.

The DeKeyser (2000) narrative is about finding a connection between AoA and L2 proficiency that is consistent with the CPH/L2A. But by framing the study around the 'robustness of critical period effects', the most robustly predictive factor in proficiency—education—is neglected (see Hakuta et al. 2003 on the role of education in L2 proficiency over AoA).

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[2] DeKeyser (2000: 515) erroneously reports that the correlation of years of schooling and GJ scores is $r = 0.006$ ns, for early arrivals, and $r = 0.08$ ns, for late arrivals. In fact, these reported coefficients reflect correlations of years of schooling with *aptitude*; see discussion to follow.

Researchers in SLA have an interest in knowing what factors account for L2 proficiency in a sampled population. This interest is not limited to explanations of high-aptitude late learners' proficiency as a function of assumptions of the CPH/ L2A. A more fundamental concern is accounting for L2 proficiency globally, over all AoA and over all aptitudes. Perhaps the coat's palette might include a few neutral tones alongside the many bespoke hues.

6 Conclusion

The CPH coat of many colors, pointedly so named by David Singleton, has a history going back to Penfield and Roberts (1959) and Lenneberg (1967). Over the ensuing years the garment has graced the torso of many a modish scholar. The present contribution has suggested that a gusset here, a gather there, might mean the difference between a well-worn coat and one that is worn well.

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The Association Between Aptitude Components and Language Skills in Young Learners

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Abstract Studies of language aptitude in young learners are scarce. However, it may be claimed that in the current revitalization of language aptitude age-related concerns have played a significant role. It has been argued that language aptitude, in particular analytical abilities, is associated to high attainment in late learners, thereby providing an explanation for those cases of successful late learners that challenge the critical period hypothesis (DeKeyser 2000). However, recent research has found that language aptitude also seems to have an explanatory role for young starters (Abrahamsson and Hyltenstam 2008; Grañena 2012). In that respect, Muñoz and Singleton (2011) have suggested that a research question needing further elucidation is whether a high level of language learning aptitude is a prerequisite for high levels of proficiency in late learners only. Accordingly, this chapter presents a study that examines whether language learning aptitude, as measured by the *Elementary Modern Language Aptitude Test*, is significantly associated with proficiency in a group of Spanish-Catalan bilingual learners of English. Participants are 48 primary school children in fifth and sixth grades (ages 10–11 and 11–12). Specifically, the study compares the strength of the association between aptitude scores with speaking skills and with listening, reading and writing skills, as well as the relationship between the different aptitude components and those skills. The results show significant correlations with all language dimensions, although the predictive value of the aptitude test seems weaker for speaking. The results also highlight the role played by grammatical sensitivity in relation to writing outcomes.

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1 Introduction

Research on young learners' language learning aptitude is very scant, although both the current upsurge of interest in research on aptitude in general (see Skehan 2012) and the increasing numbers of foreign and second language learners in the world are triggering more investigations in this area. Language aptitude has been defined and conceptualized in different ways since studies began. Carroll (1973) views aptitude as referring to the rate of progress that an individual will make in learning a foreign language (FL). Carroll and Sapon (1959) designed the most widely-used language aptitude test to date, the *Modern Language Aptitude Test* (MLAT). Although shortcomings of the MLAT have been made evident (for a review see Sawyer and Ranta 2001), other aptitude tests have been designed (such as CANAL-FT by Grigorenko, Stenberg and Erham 2000), and other models of language aptitude have been proposed (e.g. Robinson 2002; Sternberg 2002; see Skehan 2012, for a recent review), the extensive use of the MLAT in research has produced interesting findings and motivated the development of an elementary form for young learners, the *Elementary Modern Language Aptitude Test* (MLAT-E).

The present study aims to contribute to filling the gap existing in research on young learners by exploring the association between language learning aptitude, as measured by the MLAT-E, and young learners' FL outcomes. In doing so, the study focuses on the role that may be played by young learners' aptitude in learning different types of skills, and the association between the different aptitude components and those skills.

2 Aptitude Research

The MLAT was constructed from a model derived from factor analyses of a large number of individual characteristics believed to contribute to second language (L2) learning in an audiolingual methodology context (see Suárez 2010). The resulting battery consists of five subtests relatively uncorrelated and with consistent validity (Carroll and Sapon 1959). These are: (1) Number Learning, aimed at measuring rote memory, but which was also found to be a measure of a type of auditory alertness that plays a role in auditory comprehension of a FL; (2) Phonetic Script, aimed at measuring sound-symbol association ability, i.e. the ability to learn correspondences between speech sounds and spelling, and memory for speech sounds; (3) Spelling Clues, aimed at measuring vocabulary knowledge and sound-symbol association ability; (4) Words in Sentences, intended to measure grammatical sensitivity; and (5) Paired Associates, intended to measure associative rote memory. Although the MLAT has been criticized for its atheoretical approach (Dörnyei 2005), research has found it to be a good predictor of success in FL learning and correlations of between .30 and .55 have been found between MLAT scores and achievement tests (Skehan 2012).

Two issues concerning the MLAT (and aptitude tests based broadly on it) are briefly reviewed here: the strength of the association between the test and different learning conditions, and the validity and usefulness of the test to investigate young learners' aptitude. First, early research conducted in form-oriented classrooms suggested that aptitude is more strongly related to class marks than to communicative skills (Gardner et al. 1976). Several studies also found that the Words in Sentences component (e.g. Gardner and Lambert 1972; Bialystok and Fröhlich 1978; Ehrman and Oxford 1995; Hummel 2009) had the strongest predictive value, though this relation was not equally strong with all test scores. For example, in the study by Bialystok and Fröhlich (1978) Words in Sentences was not so strongly related to the listening test, which was the one that required the least explicit grammatical knowledge of the FL. These findings are connected to Krashen's (1981) criticism that aptitude is only predictive of learning outcomes in explicit learning settings. However, results from different studies have since challenged this claim. De Graaf (1997) provided evidence that aptitude, as measured by the Words in Sentences subtest of the MLAT and a lexical inferencing task, correlated with outcomes in both students who had been given explicit grammar instruction (n = 27) and students who had not been taught grammar explicitly (n = 27). Robinson (1997) found, in a group of 104 learners, that language aptitude measures—the Words in Sentences and the Paired-Associates subtests—were predictive of outcomes in both explicit and implicit learning situations. He also found that the Words in Sentences subtest correlated most strongly with learning in the implicit condition of his study. A study by Ranta (2002), with 150 learners, found a significant association between language analytical ability measured by a test of grammatical sensitivity in the learners' L1 and above average performance on the L2 measures in a communicative classroom. In a study comparing the effects of aptitude on outcomes from three different instructional methods (deductive, inductive and structured input) with 60 students in their second year, Erlam (2005) found that deductive instruction leveled out the effect that individual differences in aptitude may have on L2 outcomes; that in the inductive group learners with great analytical ability as measured by the Words in Sentences subtest of MLAT benefited most from this approach, in line with results in Robinson (1997) and with Skehan's (1989) suggestion that more talented students are more able to cope with 'less structured' material; and that students in the structured input group who had greater working memory capacity and those with greater analytical abilities also benefited from this type of instruction. The recent study by Grañena (2012) also showed that aptitude was a good predictor of both implicit and explicit learning, although she used the LLAMA aptitude test (Meara 2005), only partly based on the MLAT. Participants in her study were 120 L1 Chinese-L2 Spanish bilinguals, 50 early and 50 late L2 learners and 20 NS controls. She sought to find evidence of two types of aptitude, one for implicit learning and one for explicit learning and found, as predicted, distinct associations with measures that were assumed to require automatic use of L2 knowledge and measures that allow for controlled use of L2 knowledge, respectively.

A different conclusion was drawn from the study by Sáfár and Kormos (2008), who used the *Hungarian Language Aptitude Test* (HUNLAT; Otto 2002) based on the MLAT (and incorporating a language analysis subtest). In their study of 54 students of English (aged 15–16) in an intensive English-Hungarian programme, Sáfár and Kormos found that, for students who were instructed with communicative methods and a focus-on-form, the correlation between scores in the HUNLAT and proficiency scores were only moderate (0.36, $p < 0.05$), and that a working memory test appeared to have a higher predictive power than the traditional aptitude test. Interestingly, they also found that the aptitude test scores at the end of the academic year were higher than at the beginning, which indicated that language learning exerted an important influence on these learners' language aptitude as measured by the HUNLAT. Specifically, the Hidden Words subtest showed a significant increase, which, according to the authors, indicates that it does not measure an underlying cognitive ability but rather a skill that can be trained. As can be seen from this brief review, the jury is still out on the relationship between language aptitude testing and learning experience.

In relation to learners' age, it has been argued that language aptitude, and in particular analytic abilities as measured by the Words in Sentences subtest, is associated with high attainment in late learners, thereby providing an explanation for those cases of successful late learners that challenge the critical period hypothesis (DeKeyser 2000). However, recent research has found that language aptitude also seems to have an explanatory role for young starters, that is, those learners that began learning the L2 in childhood (Abrahamsson and Hyltenstam 2008). In that respect, Muñoz and Singleton (2011: 26) suggested that a research area in need of further elucidation is whether a high level of language learning aptitude is a prerequisite for high levels of proficiency in late learners only. The study by Grañena (2012) mentioned above provides evidence for the lack of significant differences in the effects of cognitive aptitudes on language attainment among early and late L2 learners. Grañena found that the two types of aptitude identified in the study played a role in early L2 learners' attainment, regardless of type of outcome measure, but general intelligence did not. In contrast, the role of aptitude in late L2 learners' attainment could only be observed in certain outcome measures, and intelligence was observed to moderate late learners' attainment on measures of controlled use of knowledge.

Furthermore, the claim that high aptitude is only a prerequisite for late learners would seem to deny the role played by aptitude when learning a language in childhood, whose effects should persist later in life, given the relative stability of aptitude (Skehan 1998). The existing research findings indicate that aptitude plays a role in the acquisition of a language in adolescence and also in childhood, and it has been suggested that the role played by the different aptitude components may be moderated by learners' age. For example, the study by Harley and Hart (1997) investigated the relationship between aptitude components and L2 outcomes of early (n = 36) and late (n = 29) immersion learners when both groups were in 11th grade (aged 17). Their prediction was that in late immersion beginning in adolescence (grade 7) a positive relationship would hold between L2 outcomes and

an analytical dimension of language aptitude, whereas in early immersion beginning in grade 1 there would be a positive relationship between L2 outcomes and memory abilities. Harley and Hart used the PLAB-IV Language Analysis subtest to measure inductive language learning ability rather than the Words in Sentences subtest in the MLAT because it has been suggested that formal training may have a moderating effect on grammatical sensitivity measured by the MLAT subtest (Carroll 1990). To assess memory abilities, Harley and Hart used two tests, a measure of memory for text and the MLAT Words Pairs subtest, used as a test of associative memory. Findings from correlational and regression analyses provided support for their hypothesis in that early immersion students' L2 outcomes were more closely associated with memory ability, and late immersion outcomes with analytical language ability. However, as Harley and Hart point out, this association may be an artifact of the instructional programs involved, with initial instruction in early immersion oriented toward incidental learning and holistic processing of meaning in context, and in late immersion involving a heavier initial focus on form. Another interesting finding was that early immersion students did not show higher aptitude scores than late immersion students. This ran counter to the researchers' hypothesis that early immersion students would have higher aptitude scores owing to the greater opportunity in early immersion to develop language learning strategies in childhood. However, the possibility could not be ruled out that the late immersion students were a more select group of higher aptitude learners, since there was no pretest to ascertain initial comparability of the two groups. All in all, the findings from this study are compatible with the general observation that young children rely more on memory than on analysis, adopting a holistic, memory-oriented approach to language processing and learning, whereas older learners may rely more on an analytic mode supported by their superior analytic abilities (Muñoz 2007).

The study by Sparks et al. (2009) with 54 students followed from 1st through 10th grades showed that the MLAT was the strongest predictor of oral and written L2 proficiency, as measured by reading comprehension, writing, and listening/speaking tests. The combination of cognitive (early L1 skills, L1 academic aptitude, L2 aptitude) and noncognitive (motivation, anxiety) variables explained as much as 66 % of the variance in total L2 proficiency, but the MLAT accounted for most of the variance (56 %). The MLAT was administered at the beginning of ninth grade (14-year-old), whereas the L2 measures were administered at the end of the students' second-year L2 course, when their mean age was 16 years, 4 months. As Sparks and his associates observe, the strength of the correlation between the MLAT and the total L2 proficiency measure (0.75) was higher than in previous studies (e.g. Skehan 2002), which was probably due to the inclusion of L2 word decoding and L2 spelling tests as measures of L2 proficiency. These were highly correlated with two of the MLAT tests, Phonetic Script and Spelling Clues, both of which tap phonological/orthographic (sound-symbol) processing. But even if these two measures were removed, the results still showed that the MLAT alone explained as much as 44 % of the variance. Similarly, when examining the individual L2 proficiency measures, the MLAT explained the largest percentage of the

variance on reading comprehension, writing, and listening/speaking. However, the authors do not report the correlations with the individual MLAT subtests.

Participants in the study by Erlam (2005) described above were also 14 years old. Only the Words in Sentences subtest of the MLAT was used in that study and correlations of this measure of analytical ability with students' grammatical gains were significant in the inductive group (where learners were not provided with rule explanations but were engaged in activities that encouraged them to take an active role in hypothesis testing), and in the structured input group (which provided no output practice). Correlations were not significant with results from the deductive group, as seen above.

Kiss and Nikolov (2005) adapted and validated the HUNLAT to test Hungarian young learners. Their test included three tests closely based on the MLAT subtests: Hidden Sounds, intended to measure phonetic coding ability, departs from the corresponding MLAT subtest in including some nonsense syllables; Words in Sentences, intended to measure grammatical sensitivity; and Vocabulary Learning, intended to measure rote learning ability. A fourth subtest, Language Analysis, designed to measure inductive learning ability, was based on the PLAB. The participants were 398 sixth graders (aged 12), who had been learning English for approximately 3 years, but with important differences in terms of teaching intensity and quality. The results revealed that the Vocabulary Learning subtest was the easiest, which, according to the authors, was in line with the suggestion by Harley and Hart (1997) that children rely on memory to a larger extent than older learners. At the other extreme, the most difficult task was Words in Sentences. The aptitude scores and the proficiency scores were significantly and highly correlated, and language aptitude explained about 22 % of the variation in English language performance, a contribution much higher than that of motivation. Another interesting finding of the study was that the time spent learning English did not correlate significantly with the scores achieved in the aptitude test, which is interpreted by Kiss and Nikolov to mean that language aptitude does not improve with practice and exposure.

Kormos and Trebits (2012) used the HUNLAT in a study with 44 adolescents (15–18 years) in a Hungarian-English bilingual programme. The study aimed at investigating how different components of language aptitude are related to learners' performance on oral and written narrative tasks, and how individual differences in language aptitude manifest themselves in tasks which make different conceptualization demands on the learners. They found that grammatical sensitivity (and deductive ability) was the component of aptitude that seemed to be most strongly related to the accuracy and complexity of production in the simpler task but not in the more complex task. Kormos and Trebits argue that grammatical sensitivity is a cognitive ability that aids the conscious and explicit acquisition of complex syntactic knowledge (Robinson 2005), and this ability might also help learners with high aptitude to consciously employ their explicit knowledge when they have sufficient attentional capacities that they can devote to linguistic encoding.

Whereas the studies above used the MLAT test or adaptations of it with adolescents, few have used the MLAT-E to measure language aptitude in children. The MLAT-E is a simplified version of the MLAT that was adapted to children

aged from 8 to 12 (Carroll and Sapon 1967), while the MLAT was aimed at measuring the language aptitude of post-adolescents and adults. Like the MLAT, it consists of four parts: Hidden Words, Matching Words, Finding Rhymes, and Number Learning. Hidden Words corresponds to Spelling Clues of the MLAT, and it aims at measuring knowledge of vocabulary, as well as sound-symbol association ability. Matching Words corresponds to Words in Sentences in the MLAT, and measures grammatical sensitivity. Finding Rhymes, a sub-test that was not in the MLAT, attempts to measure the ability to hear speech sounds by asking the test taker to select words that rhyme. Finally, Number Learning, as in the MLAT, aims at measuring the memory component (rote memory) by asking the examinee to learn the names of numbers in an artificial language.

A Spanish version of the MLAT-E was recently developed (Stansfield and Reed 2005), which facilitated research with Spanish-L1 children. Suárez (2010) set out to validate the MLAT-E in Spanish with Spanish-Catalan bilingual learners of English, and translated and adapted the MLAT-ES into Catalan to elaborate the Catalan version (MLAT-EC). She administered both tests to 629 participants aged from 8.3 to 14.9 together with a series of language tests. Results showed an increase in the means between grades 3 (8/9 years) and 4 (9/10 years), which was always higher than the increase between grades 4 and 6, as well as a plateau between grades 6 and 7. With respect to the relation between proficiency and aptitude, Suárez found that the correlations were from low to moderate, all of them statistically significant except in grade 3. As for the different aptitude components, the strength of their association with tests scores varied with grade. For example, the Number Learning component correlated with tests scores, but correlations were higher in grades 4 and 5, lower in grade 6 and non-significant in grade 7, suggesting that memory may play a smaller role with older children than with younger ones. The Matching Words component presented significant correlations with the test scores from grade 4 to grade 7 (with the exception of vocabulary), and so did the Rhyming Words component. The Hidden Words subtest presented fewer significant correlations than the other subtests. In a later study, Suárez (2012) sought to identify aptitude profiles in these young learners by means of cluster analysis. She found that the main learner profiles, analytically oriented and memory oriented, were similar to those identified in adult learners (Skehan 1986). She also found that sound-symbol association abilities were especially relevant in the lower grades, and that analytical abilities were more relevant in high achievers than memory abilities.

Using the MLAT-ES as well, Rosa and Muñoz (2013) explored the impact of language aptitude and of attitudes to the FL in 48 Spanish-Catalan bilingual learners of English in grade 5. The results indicate that language aptitude was strongly associated with pupils' outcomes in listening, writing and reading, and that this association was stronger than that between language attitudes and language outcomes. Specifically, a regression analysis showed that the two independent variables together accounted for 61 % of the variance of proficiency, but that the unique contribution of aptitude was 0.50.

Language aptitude in young learners has also been extensively investigated by Milton and Alexiou (2006); Alexiou (2005). Their work focuses on aptitude in

learners from 5 to 9 years old, taking as a model both Carroll and Sapon's MLAT-E and Esser and Kossling's (1986) cognitive tests of aptitude. Their test aims at measuring short-term rote memory, semantic integration, the capacity to retain sign pairs, considered to be equivalent to the capacity to retain FL, and the learners' classification and inductive ability. The results suggest that analytic abilities improve after about the age of six while memory does not. The latter result contrasts with findings that show a regular increase in working memory in subjects between 6 and 19 years old (Siegel 1994), so more research in young learners' language aptitude is clearly needed.

The present study aims to go some way towards filling this empirical gap by examining the relationship between young learners' language aptitude and their FL outcomes. It builds on the previous study by Rosa and Muñoz (2013) in which the association of the participants' listening, reading and writing skills with their language aptitude was investigated, by incorporating data about their speaking skills. As seen above, the MLAT has been considered by some to be a better predictor of academic than of communicative skills. In order to examine this issue, the first research question of the current study is as follows: To what extent is aptitude as measured by means of the MLAT-E associated with L2 speaking outcomes in young learners? How does this relationship compare with that shown with listening skills in the first place, and then reading and writing skills by the same learners?

As seen above, previous research with adult learners has shown that the MLAT measure of analytical abilities and grammatical sensitivity has stronger correlations with language outcomes than other subtests, but that the relation may be stronger with language tests that require explicit grammatical knowledge (e.g. Bialystok and Fröhlich 1978). The study by Harley and Hart (1997) indicated that analytical abilities and memory have been associated with older and younger learners, respectively. In order to deepen our knowledge of aptitude in young learners, and specifically the association of different abilities with L2 achievement, the second research question of this study is worded in the following way: Which aptitude component/s will show a stronger association with young learners' FL outcomes? And do the associations differ for the four different language dimensions?

3 Method

3.1 Participants

The participants were 48 Spanish-Catalan bilingual pupils from two parallel classes in a primary school, 26 boys and 22 girls, the same as in the previous study (Rosa and Muñoz 2013). They had been learning English since grade 1 and had had the same amount of instruction (a year average of 150 min per week distributed into three sessions), and the same English language teachers all through primary education. Data were collected at two times, once when they were in 5th

grade (10–11 years old) and once when they were in 6th grade (11–12 years old). In 5th grade they were administered language tests to measure their reading, writing and listening skills as well as the language learning aptitude test. In 6th grade, they were administered the speaking test reported in this study.

3.2 Instruments

The listening test comprised 20 items and pupils listened twice to two oral texts recorded on a CD. The reading test comprised 20 items; students had to answer questions or circle the correct option about two written texts. Both the listening and the reading tests were extracted from the course book used by these pupils in the English class. To gauge their writing skills, participants were asked to write a timed composition about themselves without any help. They had twenty minutes to finish the task.

Writing was operationalised as the result of different measures of complexity, accuracy and fluency (CAF). For complexity, lexical and syntactic complexity was considered. The measure for lexical complexity was the Guiraud's index (types/$\sqrt{}$tokens) and the measure for syntactic complexity was the number of words per clause. To measure accuracy, the number of errors per 30 words was calculated to correct for differences in the length of their compositions (30 words was the minimum length observed). The total number of words was used to measure fluency (excluding words in Spanish or Catalan and proper names).

The speaking test was a component of the *Young Learners English* or *Movers* test, which is specifically designed for schoolchildren aged between 7 and 12. It is a face-to-face test in 4 parts that takes between 5 and 7 min. In the first part, pupils are asked to describe four differences in two pictures. In the second part, pupils are asked to describe a set of pictures that tell a story. In the third part, pupils are asked to say which picture is different in four sets of four pictures. The fourth part measures pupils' understanding of and responding to personal questions.

The MLAT-ES was used to measure the pupils' language learning aptitude, because although Catalan is the language of instruction at the school, they were Spanish dominant (the families' L1 is Spanish rather than Catalan, and Spanish is the dominant language in the area where the school is located). Reliability, using Cronbach's alpha, was estimated on the population involved in the testing and it was 0.797.

4 Results

Descriptive statistics for these learners' scores on the speaking test and the language aptitude test are indicated in Table 1: mean scores, standard deviations in parentheses, range and maximum possible scores.

Table 1 Descriptive statistics. Speaking test and language aptitude test scores

	Mean score (SD)	Range	Max. possible score
Speaking scores N = 46	69.13 (21.27)	20–100	100
MLAT-E N = 48	86.52 (23.51)	35–121	123
Hidden Words	20.23 (7.22)	3–30	30
Matching Words	16.75 (8.34)	1–29	30
Finding Rhymes	30.29 (7.21)	10–38	38
Number Learning	19.25 (6.96)	3–25	25

Table 2 Correlations of speaking and language aptitude test (total and components)

	T. MLAT-E	Hidden words	Matching words	Finding rhymes	Number learning
Speaking scores	0.356*	0.163	0.259	0.323*	0.397**
N = 46	0.015	0.280	0.082	0.029	0.006

*$p < 0.05$
**$p < 0.01$

Bivariate correlations using Pearson's product moment were calculated. An alpha level of .05 was set as the decision level for all correlations. Table 2 shows the correlation coefficients obtained for the 46 pupils who took the language and the aptitude tests. The analyses revealed that the speaking test scores and the aptitude test global scores were significantly, although modestly, related (0.356, $p < 0.05$) as were the speaking test scores and the scores on Finding Rhymes (ability to hear speech sounds) (0.323, $p < 0.05$). The association was stronger between the speaking test scores and the rote memory subtest (0.397, $p < 0.01$).

In order to compare the relative strength of the association between the language aptitude scores and the four language dimensions, Table 3 displays the correlations obtained for listening, reading and writing (see Rosa and Muñoz (2013)) as well as for speaking. For writing, the four CAF dimensions analyzed are each presented with their respective correlations; the negative direction of the correlation for accuracy was expected. The corresponding descriptive statistics appear in the Appendix.

To begin with, Table 3 shows that language aptitude as measured by the MLAT seems to be less strongly related to speaking scores than to scores in the other dimensions, whereas the correlation between the aptitude scores and the writing scores is the highest. Specifically, as seen above, speaking scores correlated significantly with only two of the subtests that measured ability to hear speech sounds, and rote memory. Listening scores strongly correlated with the four subtests and more strongly with the ability to hear speech sounds. Reading scores correlated significantly with three of the subtests, those measuring grammatical sensitivity, ability to hear speech sounds, and rote memory. As for the CAF measures of the written task, it is to be noted that all the correlations with the four

Table 3 Correlations between the measures of the four language dimensions and the aptitude test (total and components)

	T.MLAT-E	Hidden words	Matching words	Finding rhymes	Number learning
Speaking scores	0.356*	0.163	0.259	0.323*	0.397**
N = 46	0.015	0.280	0.082	0.029	0.006
Listening scores	0.666**	0.512**	0.483**	0.609**	0.507**
N = 48	0.000	0.000	0.001	0.000	0.000
Reading scores	0.551**	0.176	0.525**	0.507**	0.531**
N = 47	0.000	0.236	0.000	0.000	0.000
Total writing scores	0.748**	0.460**	0.706**	0.573**	0.610**
N = 48	0.000	0.001	0.000	0.000	0.000
W. Lex. Complexity	0.531**	0.357*	0.549**	0.410**	0.341*
N = 48	0.000	0.013	0.000	0.004	0.018
W. Syn. Complexity	0.556**	0.349*	0.554**	0.356*	0.483**
			0.000	0.013	0.001
N = 48	0.000	0.015			
W. Accuracy	−0.703**	−0.327*	−0.629**	−0.635**	−0.624**
N = 48	0.000	0.023	0.000	0.000	0.000
W. Fluency	0.613**	0.444**	0.535**	0.439**	0.513**
N = 48	0.000	0.002	0.000	0.002	0.000

*$p < 0.05$
**$p < 0.01$

aptitude components were significant as well. The fluency measure correlated significantly with all the subtests, and similar patterns were found with the measures of lexical and syntactic complexity. Accuracy was the CAF measure with the strongest correlations with the measure of grammatical sensitivity, the ability to hear speech sounds, and rote memory, as well as with the global score for aptitude, and the correlations were negative, as expected. When merging all the measures into one single score for Writing, correlations were even stronger, particularly that with grammatical sensitivity.

As regards the second research question in this study, concerned with the relative strength of the associations of the aptitude components, Number Learning appears as the component most strongly associated with the outcomes in the different language dimensions, and Hidden Words as the least strongly associated. Specifically, the memory component correlates strongly with the four language dimensions and most strongly with writing scores (accuracy); it is also the component that holds the strongest association with speaking scores. The Hidden Words subtest measuring sound-symbol associations and vocabulary shows a high correlation with listening scores, and also with writing (and particularly fluency, as measured by number of words), but not with speaking or reading outcomes. The Matching Words subtest, the measure of grammatical sensitivity, shows the highest correlation with writing, but also with reading and listening, though not

with speaking. The Finding Rhymes component measuring the ability to hear speech sounds correlates with the four language components, and the strongest correlation is with listening, as well as with writing accuracy. In sum, though differences are not large, the measure of rote memory from the MLAT appears to have the strongest association with all the language dimensions in these young learners, the ability to hear speech sounds also presents strong association with all the dimensions, analytical abilities seem to be particularly associated with writing and writing accuracy, and finally the measure of vocabulary and ability to make sound symbol associations shows significant correlations with listening and writing (especially fluency as measured by number of words).

5 Discussion

The first question investigated in this study was whether young learners' language aptitude as measured by means of the elementary version of the MLAT would be positively associated with their L2 outcomes in a speaking test. Correlational analyses indicated a significant relationship, but only moderate. Indeed, in these learners aptitude seems less strongly associated to speaking than to reading, listening, and writing (accuracy, particularly), in order of increasing strength. First, the general results suggest that the MLAT-ES may have a higher predictive value of academic skills, such as accuracy in writing, than of communicative skills such as speaking, in line with Gardner et al.'s (1976) argument. However, the correlations with listening skills are very high in this study, which would weaken the claim. Specifically, listening scores showed the highest correlation with the ability to learn vocabulary (Hidden Words), but also very high correlations with the ability to hear speech sounds (Finding Rhymes), which could be expected, and with rote memory abilities, which could also help store lexical items and chunks.

On the other hand, Suárez (2010) found that the correlation between the MLAT (in the Spanish and Catalan versions) and listening skills was weaker than with other tests (dictation and cloze task) in both grades 5 and 6. Further research is clearly needed to examine this issue. Second, the finding that speaking scores and the grammatical sensitivity subtest failed to correlate significantly suggests that the latter component is not so important for speaking at beginner levels, and maybe this is the case as well with the ability to establish sound-symbol associations.

Neither was reading seen to correlate significantly with the ability to make sound-symbol connections in these beginner learners. As Harley and Hart (1997) point out, a skill as complex as reading, which draws on multiple cognitive resources, may also be strongly dependent on L1 literacy skills, which were not specifically measured in this study. Writing correlated strongly with the four aptitude components; accuracy in the written task was the measure that showed the strongest correlation with the grammatical sensitivity component, as could be expected; also as expected, fluency in the written task was the CAF measure that showed the highest correlation with the ability to learn vocabulary (Hidden Words).

All in all, these results suggest that the MLAT-ES components are good predictors of different aspects involved in language learning, though the strength of the associations with academic skills seems slightly higher than with speaking. Therefore, in answer to the first research question, the findings indicate that the predictive value of the aptitude test seemed weaker for speaking in these young learners in an instructed learning setting. Further comparative research should investigate whether similar results are found in a naturalistic setting, and hence the possible mediating role of learning context.

The second research question enquired about the relative strength of the association between each aptitude component and these young learners' language outcomes. It was found that differences are not large, although the measure of rote memory from the MLAT shows slightly stronger correlations than the other aptitude components and was also the component most strongly related to speaking. Harley and Hart (1997) suggested that the association with memory abilities in young starters may have been partly explained as an influence of the type of instruction characteristic of this age group. In the current study, the influence of the typical activities in the primary classroom, such as songs and games in which chunks tend to be memorized, cannot be totally discarded either.

Next, the ability to hear speech sounds (Rhyming Words) also showed moderate to high correlations with all the language measures, in line with the findings by Suárez (2012). The ability to detect rhymes is associated to the construct of phonological awareness, which has been causally related to reading ability (e.g. Stuart and Masterson 1992; Hulme et al. 2012). However, in this study this component appears more strongly associated with listening skills than with reading skills. The strong association of the ability to hear speech sounds with listening skills is in line with expectations.

In turn, the Matching Words component is not significantly correlated with speaking and the association with listening is weaker than with reading and writing skills, as found in the study by Bialystok and Fröhlich (1978). As these authors suggested, this may be explained by the fact that both speaking and listening require less explicit grammatical knowledge than reading and writing. Indeed, in these young learners' data, grammatical sensitivity appears closely associated with all the writing measures (and slightly more so with accuracy). Kormos and Trebits (2012), as indicated above, also found that grammatical sensitivity (and deductive ability) was the component of aptitude that seemed to be most strongly related to the accuracy and complexity of the participants' production in the less complex task. In the present study, the personal description in the written composition did not impose high cognitive demands on students either, so that grammatical sensitivity may also have helped these young learners to consciously employ their explicit knowledge in a task that allowed them sufficient attentional capacities.

Last, the Hidden Words component, measuring the ability to make sound-symbol associations and vocabulary, shows fewer and weaker correlations with the language components. Suárez (2010, 2012) also found this component only relevant in the lower grades. Sáfar and Kormos (2008) found a significant improvement in this subtest at the end of the academic year, which led them to argue that

this subtest yields a measure of phonological sensitivity that improves with language learning experience. In the current study, it may be that the instruction these primary school learners receive does not give them sufficient exposure and training in processing L2 sounds, in contrast to the participants in their study, who were adolescents following an intensive bilingual programme. Nevertheless, it is interesting to note that the association with vocabulary in the current study is clear in that the two higher correlations appear to be with listening scores and with the fluency measure (total number of words) in the written composition.

In summary, the study found that memory abilities held only slightly stronger associations with these young learners' language outcomes than other aptitude components and differences were not large enough to conclude that they play the most critical role in young learners, but rather that children rely on memory to a large extent, as also suggested by previous studies (Kiss and Nikolov 2005). In fact, the ability to hear speech sounds and grammatical sensitivity were also very relevant in these learners, as found by Suárez (2012). Another interesting finding was that grammatical sensitivity had a closer relationship with the scores from the written task, to which learners may have applied more explicit knowledge than to the other tasks, also in line with previous research (Bialystok and Fröhlich 1978). However, this component did not have such strong correlations with language outcomes as those shown in studies with older learners, which appears as an age-related effect. As suggested by Suárez (2012), high grammatical sensitivity may be a distinctive characteristic of high achievers among children, which is in line with the observation that the Words in Sentences subtest was the most difficult task for the 6th-graders in the study by Kiss and Nikolov (2005), and hence it may have the strongest discriminatory power. In sum, these findings suggest that though young children may rely more on memory generally, only those children who also have superior analytical abilities are high achievers.

Globally, the findings confirm that the MLAT-E is a good predictor of achievement at beginner levels of proficiency in a mainstream (not immersion) primary classroom, as in the study by Kiss and Nikolov (2005) with 6th-graders, and by Suárez (2010) in grades 4–7. It may well be that the MLAT is a better predictor at beginning stages of language learning than at more advanced stages, and for explicit instructed L2 learning than for incidental learning, as Robinson (2013) argues. It is interesting to note that in the present study participants had had at least six years' experience learning English and yet they were at beginner levels of proficiency, in contrast to most studies with older learners in which proficiency level and learning experience go more hand in hand. The slower learning rate of young learners and differences in intensity of teaching programs may partly explain the mixed findings concerning time spent in learning and changes in aptitude. Whereas Sáfár and Kormos (2008), with adolescents in an intensive course, found an effect of learning experience on aptitude, Kiss and Nikolov (2005), with sixth graders in typical classrooms, found no effect for time spent learning the language on learners' aptitude. On the other hand, the results in Suárez (2010) suggest that the observed changes in aptitude in primary school children may be more strongly related to cognitive development than to time spent

in learning. Further research is needed that explores the effects of proficiency, learning experience, and age, in order to unveil the role of each of these factors.

Finally, it has to be acknowledged that this study has a number of limitations, among them the fact that the speaking test, which was an external and standard test, may have been less related to the teaching/learning experience of these learners than the other language tests. This study also shares with most aptitude-related studies the limitation that aptitude was not measured at the beginning of the learning process (see Sáfár and Kormos 2008), a condition that is increasingly difficult to meet with the progressively younger age of learners at the beginning of FL instruction. Moreover, further research is needed with young learners that helps validate the MLAT-E as well as develop theory-based measures that can better predict the type of communicative skills that are practiced in the primary class-room. It should also be noted that the current aptitude agenda includes a great concern for working memory as a cognitive ability that may account for different aspects of L2 learning (Miyake and Friedman 1998; Swayer and Ranta 2001; Kormos and Sáfár 2008). The extension of this interest to young learners seems a promising area for research as well.

Appendix

	Mean score (SD)	Range
Listening scores N = 48	13.27 (3.81)	5–20*
Reading scores N = 47	13.96 (3.71)	2–20*
Writing lexical complexity N = 48	3.72 (0.79)	1.64–5.30
Writing syntactic complexity N = 48	4.93 (0.89)	3–7.12
Writing accuracy N = 48	5.35 (2.96)	0–17
Writing fluency N = 48	54.5 (22.42)	17–112

*maximum possible score = 20

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Cross-Linguistic Influence in L2 Writing: The Role of Short-Term Memory

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Abstract The present chapter explores the relationship between individual differences in phonological short-term memory (PTSM) efficiency and the amount of cross-linguistic influence evidenced in second language (L2) collocations produced in writing. Elementary and intermediate L2 learners "may not have sufficient available processing capacity to pay careful attention to how words are conventionally combined" (Bonk 2001: 116–117) and when not sure of the correct L2 form they may resort to avoidance or transfer from the first language (L1). The argument posited in the current paper is that lower levels of PSTM functioning eventuate in lower levels of L2 collocational knowledge, which results in learners' falling back on L1 collocational patterns simply because the relevant L2 resources are lacking. The article builds on the large body of research on L1/L2 language acquisition, specifically on the relationship between stage of learning and the role of cross-lexical interaction (see e.g. Singleton 1999, 2012; Skrzypek and Singleton 2013a) as well as that between PSTM and vocabulary learning in L1 and L2 (e.g. Gathercole et al. 1992). Even though the link between PSTM and vocabulary knowledge is believed to be strongest in the early stages of language acquisition (see e.g. Gathercole 2006a, b), PSTM has recently been shown to be implicated in the development of L2 collocational knowledge (more specifically, controlled production of L2 collocations) not only in beginners but also in pre-intermediate adult learners (Skrzypek and Singleton 2013b). The current study investigates whether similar patterns can be traced in relation to cross-linguistic influence in samples of writing of elementary and pre-intermediate L2 learners.

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1 Introduction

1.1 Sequencing in SLA and Short-Term Memory

The current paper draws on the notion that much of language learning involves the learning of sequences that commonly occur in the language an individual is attempting to acquire. Proponents of formula-based approaches maintain that the learning of fixed sequences is an essential aspect of the learning process, and that this process of sequence learning leads to the development of creative aspects of language (e.g. Nattinger and DeCarrico 1992: 114–116; Tomasello 2003: 305–307). According to this account, the fluent mastery of both native (L1) and second (L2) language involves the learning and analysing of memorized sequences of language (Ellis 1996, 2003). Language learning involves acquiring different types of sequences, for example sound sequences in syllables, syllable sequences in words, and word sequences in phrases. Learning discourse to a large degree involves learning sequences of co-occurring words, such as collocations, longer chunks of lexis and idioms. The idiom principle (Sinclair 1987, 1991), commonly referred to in the literature on the collocational dimension of the L2 mental lexicon, highlights the significance of such co-occurrences of words. It would seem that when one unit of language is completed (be it a word, a phrase or a clause) and grammatical rules are adhered to, a number of words should fit into the subsequent slot (as the so-called open choice principle stipulates), and yet restrictions other than grammaticality often emerge and further limit the number of options available in the neigbouring slot (the idiom principle). According to Sinclair, discourse is created on the basis of the interaction between the idiom principle and the open choice principle, but that it is the idiom principle that is the default mode of speech interpretation and production (Sinclair 1987: 320–324).

Sequence learning is closely tied to the notion of chunking. The term *chunking* was first introduced by George Miller (1956) in his review of short-term memory (STM), in which he argued that the span of STM remains more or less constant at the level of approximately 7 items, regardless of how much information is encoded as one chunk. The implication was that by coding simple items into more complex chunks we could substantially increase the amount of information our memory can hold. A model of language learning put forward by Ellis (2001) is based on the very same principle of chunking in that it posits that smaller chunks of language are available for re-coding into bigger chunks. According to this account, learning vocabulary involves sequencing at the level of syllable structures and phonotactic sequences. Learning discourse involves the sequencing of phrases and collocations, while learning grammar involves abstracting structural similarities from "previously experienced utterances which share structural and functional similarity" (Ellis 2001: 49).

1.2 Short-Term Memory and Language Learning at Different Proficiency Levels

Having highlighted the significance of sequence learning in L1 and L2 language learning, we shall now move on to the impact of variation in sequencing ability exhibited among language learners on their STM scores and their long-term language learning.

Individuals are known to differ in their ability to repeat verbal sequences, which results in individual variation in scores obtained in verbal memory tests. The current paper focuses on a component of working memory (WM) that has been identified as particularly relevant in the context of L2 lexical learning. The component in question—phonological short-term memory (phonological STM, also referred to as the phonological loop and verbal STM)—is believed to be responsible for the manipulation and retention of verbal material. Within the most widely researched WM model, the so-called multi-component WM model (Baddeley and Hitch 1974; Baddeley 2000, 2007), phonological STM is viewed as a subsidiary system along with two other subsidiary systems [the visuospatial sketchpad and the more recently incorporated episodic buffer (Baddeley 2000)] and one supervisory attentional system (the central executive). In this paper the term *phonological STM* is used to refer to the ability to store small amounts of verbal information in memory over a very brief interval.

Individual variation in the ability to store and repeat verbal sequences, reflected in phonological STM scores, has been linked to vocabulary acquisition and grammatical learning in first and second language learning. The evidence in this area draws on findings in laboratory and formal settings (e.g. Cheung 1996; Papagno and Vallar 1992; Service 1992; Service and Craik, 1993; Skrzypek 2010, 2013; Speciale et al. 2004), and these findings are applicable to a broad range of subjects, including normally developing children, children with language impairments, normal adults and adults with brain injuries (e.g. Baddeley et al. 1998; Gathercole and Baddeley 1990; Gupta 2003; Montgomery 1995).

Phonological STM performance has been shown to be closely linked to the rate of vocabulary learning and the level of vocabulary attainment in child L1 (Gathercole et al. 1992; Jarrold et al. 2004) and L2 learning (French 2004) as well as in adult L2 learning (Skrzypek 2009, but compare O'Brien et al. 2006, who failed to obtain this pattern of results, and Service and Craik, 1993, who detected a link between PSTM and L2 vocabulary in older but not in younger adults).

The involvement of phonological STM in vocabulary acquisition appears to decrease as the level of familiarity with L1 (Gathercole et al. 1992) and L2 (Skrzypek 2013) increases. In a longitudinal study by Skrzypek (2013) that employed the cross-lagged correlational paradigm, phonological STM was shown to be a causal determinant of subsequent knowledge of L2 vocabulary in adults at an early stage of L2 proficiency development (elementary), but not at a more advanced level (pre-intermediate). These results support the view that individual differences in phonological STM capacity have a particularly noticeable impact on

L2 vocabulary learning at relatively early stages of L2 proficiency. One possible explanation for this pattern is that as L2 proficiency increases the learner's phonological generalizations become increasingly robust. This knowledge of phonological generalizations can be a facilitating element in the learning of new words. While attempting to learn a new word the learner could, for example, access phonological representations of close neighbours of the word. While learning the adjective *unpleasant* the learner could access the adjective *pleasant* and the prefix *un* from long-term memory (LTM). When a phonological representation of a close neighbour of a new word is available, a reduced amount of burden is placed on limited-capacity phonological STM, rendering correlations between phonological STM scores and L2 vocabulary scores weaker.

In relation to the learning of sequences of co-occurring words in L2, the role of phonological short-term memory has recently been examined in relation in controlled productive knowledge of L2 collocations in adult Polish learners of English (Skrzypek and Singleton 2013b, preliminary results reported in Skrzypek 2009). In the Skrzypek and Singleton study, L2 collocations were conceptualized as two-word units in which the co-occurring item appeared within 3 words to the left or right of the node. Controlled productive general knowledge of L2 collocations, tapped by fill-in-the-blanks task scores, was measured twice with a 6-month interval in between. A significant link was detected between phonological STM measures and subsequent knowledge of L2 collocations at a relatively low level of L2 proficiency (elementary), and more interestingly also at a more advanced level (pre-intermediate). The results reported in Skrzypek (2013) and Skrzypek and Singleton (2013b) support the view that at initial stages of L2 learning phonological STM is mainly deployed for vocabulary learning, but at later stages—when vocabulary access is more automatic—phonological STM is redeployed for learning more complex sequential structures.

1.3 Cross-Linguistic Influence and L2 Proficiency

Adult L2 learners are equipped with a fully-developed L1 system, and have some degree of knowledge of abstract categories and an intuitive understanding of which word combinations are more acceptable than others in their L1. This knowledge of acceptable combinations in L1 may at times interfere with the production of correct collocations in L1, thus resulting in cross-linguistic influence.

The notion of cross-linguistic influence having its origins in ignorance goes back to Newmark's endeavours in the 1960s to put distance between the notion of language transfer and discredited behaviourism, with which it was widely associated (Newmark 1966; Newmark and Reibel 1968). Newmark and Reibel's 'Ignorance Hypothesis' gave the following non-behaviourist account of transfer:

> (…) a person knows how to speak one language (…) but in his early stages of learning the new one there are many things he has not yet learned to do (…) What can he do other than

use what he already knows to make up for what he does not know? To an observer (…) the learner will seem to be stubbornly substituting the native habits for target habits. But from the learner's point of view, all he is doing is the best he can: to fill in the gaps of training he refers for help to what he already knows (Newmark and Reibel 1968: 159ff).

This approach to the phenomenon of cross-linguistic influence also featured in the work of Corder (e.g. 1978, 1983) and Krashen (e.g. 1981, 1983), who both focused heavily on the strategic dimension of transfer—transfer as 'padding', 'borrowing', 'resource expansion' 'when new knowledge is lacking' (Krashen 1983: 148; cf. also Singleton 2012).

In the literature specifically focused on communication strategies one strategy-type that is ubiquitously mentioned is the deployment of knowledge of languages other than that in which communication is taking place. Thus, for example, 'conscious transfer'—covering 'literal translation' and 'language switch'—is one of Tarone's (1977) categories; Faerch et al. (1984) have a category labelled 'L1 based strategies', which includes 'code-switching', 'Anglicizing' (where the L2 is English; the more general term is *foreignizing*) and 'literal translation'; and Kellerman (1991: 150) sees resorting to another language as one of the 'two fundamental ways' in which the linguistic or code archistrategy operates. Communication strategies are, of course, widely seen as 'problem-solving devices that learners resort to in order to solve what they experience as problems in speech production and reception' (Faerch et al. 1984: 154), in other words as responses to gaps in linguistic knowledge, including temporary gaps.

More broadly, there is a longstanding discussion in the SLA literature on the general question of the relationship between proficiency and cross-linguistic influence (cf. e.g. Odlin 1989: 133ff.). An oft-cited study in this connection is that of Taylor (1975), who found that more advanced Hispanophone students of English were less likely than elementary-level students to produce errors which reflected L1 influence. Broadly similar results emerge from a number of other studies. Chen (1999), for example, in a study of evidence of cross-linguistic influence in the English written production of Chinese learners of English found that manifestations of L1 transfer appeared primarily at the early stages of learning and decreased as learners' L2 proficiency increased.

2 Methodology

2.1 Contextualization and Rationale

The context of the current study is a set of results obtained in 2008 in Ireland under the umbrella of a larger project, the Polish Diaspora Project in Ireland and France. This paper draws on Skrzypek (2009) and Skrzypek and Singleton (2013a, b), which presented analyses of some sets of the data collected in 2008. Additional

analyses that have not been reported earlier are included in the current paper. The articles listed above draw on results obtained from the same sample of L2 learners.

The current study is a follow-up to the Skrzypek and Singleton paper (2013a). In their paper Skrzypek and Singleton looked at the relationship between phonological STM and the operation of cross-linguistic factor evidenced in attempts to produce L2 collocations in a fill-in-the-blanks task (thus tapping controlled productive knowledge of L2 collocations). The pattern of results obtained indicates that at the elementary level of L2 proficiency there is a link between individual differences in phonological STM capacity and the operation of cross-linguistic influence evidenced in the number of cross-linguistic collocational errors (significant negative correlations detected). The data obtained at the pre-intermediate level of L2 proficiency do not support the existence of a relationship between phonological STM and cross-linguistic errors in the collocational domain. A week negative correlation was detected between a measure of phonological STM (serial nonword recognition) and cross-linguistic scores, but the correlation was non-significant. A week negative partial correlation was detected between serial nonword recall and cross-linguistic scores (with exposure to L2 partialled out), but it was also non-significant.

The current paper sets out to explore free productive knowledge of L2 collocations, that is the ability to use target collocations in free writing, in order to establish whether the pattern of results obtained by Skrzypek and Singleton (2013a) can be extended to a context in which collocations are produced freely without any specific prompts put in place to elicit them. The distinction between controlled and free productive knowledge of L2 collocations is important here, as some learners may provide a correct collocation when forced to do so in a fill-in-the-blanks test, and yet fail to use the very same collocation correctly in free composition when left to their own selection of words. The earlier results could have been affected to some extent by the test format used in Skrzypek and Singleton (2013a), and therefore the present data derive from a production task which could be argued to reflect the participants' productive collocational proficiency when no specific prompts are put in place.

2.2 Research Questions

The current paper explores two questions, set out and commented on in what follows.

(1) Is there a relationship between phonological STM scores and the number of cross-linguistic errors evidenced in attempts by L2 learners at the A2 level (elementary) to produce L2 collocations in writing?

It has been shown that lower levels of phonological STM capacity result in lower levels of L2 collocational knowledge in adult L2 learners (Skrzypek 2009).

Since lower levels of PSTM functioning eventuate in lower levels of L2 collocational knowledge, it is plausible to speculate that this may result in learners' falling back on L1 collocational patterns owing to lack of relevant L2 resources, as shown in the case of controlled productive knowledge of L2 collocations (Skrzypek and Singleton 2013a). If this is also the case in relation to free productive knowledge of L2 collocations, we would expect to observe negative correlations between phonological STM scores (reflecting individual variation in phonological STM capacity) and cross-linguistic scores (reflecting the numbers of errors that can be attributable to L1 influence in the end-of-course test).

(2) Is there a relationship between phonological STM scores and the number of cross-linguistic errors evidenced in attempts by L2 learners at the B1 level (pre-intermediate) to produce L2 collocations in writing?

At a pre-intermediate level of proficiency, individual variation in phonological STM capacity has also been linked to subsequent knowledge of L2 collocations in adult L2 learners (Skrzypek 2009; Skrzypek and Singleton 2013b). The prediction could, therefore, resemble that outlined above in relation to A2 learners; namely, lower levels of L2 collocational knowledge may result in a falling back on L1 collocational patterns. However, since research on cross-linguistic influence and L2 proficiency indicates that L2 learners at higher levels of proficiency are less likely to produce errors that reflect L1 influence (Taylor 1975), it is also plausible to entertain the view that pre-intermediate learners may rely less heavily on L1 structures and adopt other strategies to deal with L2 collocations, as shown in Skrzypek and Singleton (Skrzypek and Singleton 2013a) in relation to controlled productive knowledge of L2 collocations. It is plausible that when free productive knowledge of L2 collocations is examined correlations between phonological STM scores and cross-linguistic scores may also be non-significant.

2.3 Participants

The sample comprised 60 adult Polish learners of English resident in Ireland (age range 25–35), 30 of which were at the A2 level of proficiency and 30 at the B1 level. Proficiency levels were defined in accordance with the Common European Framework of Reference (CEFR; Council of Europe 2001) and were measured by the OUP Pen and Paper Placement Test (2001). The longitudinal data obtained in this study came from 24 males and 36 females (see Table 1 for more information about the participants).

The individuals who expressed a willingness to participate in our project were offered a six-month English language course at Trinity College Dublin (TCD) free of charge (see Skrzypek 2010 for a detailed description of the TCD course). None of our subjects attended any other English language course for the duration of this study. Since a certain level of dropout from the TCD course was anticipated owing to motivational factors or other unforeseen circumstances, we recruited over 100

Table 1 Background information about participants

Group	A2		B1	
	(n = 30)		(n = 30)	
Gender	13 males		11 males	
	17 females		19 females	
Age	M = 29.3		M = 30.4	
(years)	SD = 4.091		SD = 3.654	
Residence in	M = 17.16		M = 24	
Ireland (months)	SD = 7.61		SD = 11.76	
Context of first	Primary	26.67 %	Primary	26.67 %
exposure to English	Secondary	26.67 %	Secondary	23.33 %
	Vocational	0 %	Vocational	0 %
	Tertiary	16.67 %	Tertiary	26.67 %
	Other (e.g. private tuition)	30 %	Other (e.g. private tuition)	23.33 %
Education	Secondary	46.67 %	Secondary	10 %
	Vocational	10.0 %	Vocational	3.33 %
	Tertiary	43.33 %	Tertiary	86.67 %
Other foreign languages	Russian	50 %	Russian	43.33 %
	German	46.67 %	German	66.67 %
	French	13.33 %	French	13.33 %
	Italian	3.33 %	Italian	6.67 %
	Spanish	3.33 %	Dutch	3.33 %
Number of other foreign	One	83.33 %	One	76.67 %
languages per student	Two	16.67 %	Two	23.33 %

subjects. Approximately 40 % of the learners who signed up for the course had to be excluded from our analyses: a few individuals reported having hearing problems or dyslexia; some subjects dropped out before completing the course: while others failed to attend one of the testing sessions.

2.4 Operational Definitions and Research Instruments

As indicated earlier, the research reported here forms part of a larger study reported in Skrzypek (2009, 2010, 2013). The current paper draws on selected data from the above study—relative to the following variables in reference to each of the two proficiency groups (A2 and B1). Phonological STM capacity was tapped by two types of nonword tasks (serial nonword recall and by serial nonword recognition) before the commencement of the TCD English language course (Time 1), thus yielding two sets of scores at each proficiency level (see Table 2). The operation of cross-linguistic factors in collocational usage—conceptualized as the number of cross-linguistic errors in a written composition—was measured at Time 2 (after the end of the six-month-long TCD course). One potentially confounding variable was

Table 2 Main constructs and corresponding measures

Underlying construct	Corresponding test scores		Scoring method
	A2 (elementary)	B1 (pre-intermediate)	
PSTM capacity (measured with articulation)	Serial nonword recall scores at Time 1[a]	Serial nonword recall scores at Time 1	1 point for each correctly repeated list of nonwords (correct-in-position criterion)
PSTM capacity (measured without articulation)	Serial nonword recognition scores at Time 1	Serial nonword recognition scores at Time 1	1 point for each correctly recognised set of lists of nonwords (as the same or different)
Exposure to L2 outside the classroom	Exposure scores[c] to L2 between Time 1 and Time 2[b]	Exposure scores to L2 between Time 1 and Time 2	averaged number of hours per day
The operation of cross-linguistic factors in collocational usage in writing	Number of cross-linguistic errors in an A2 end-of-course writing task	Number of cross-linguistic errors in an B1 end-of-course collocation test	1 point for each instance of a cross-linguistic error
Collocational usage in writing	Number of correctly used collocations in an A2 end-of-course writing task	Number of correctly used collocations in an A2 end-of-course writing task	1 point for each instance of a correct collocation

[a] *Time 1* before the commencement of the TCD English language course

[b] *Time 2* after the end of the six-month-long TCD course

[c] *Exposure scores* the average number of hours per day recorded in students' journals between Time 1 and Time 2

controlled for in our analyses, that is the amount of exposure to L2 outside the classroom (between Time 1 and Time 2). A detailed description of the piloting of all the instruments can be found in Skrzypek (2010: 144–172) along with reliability coefficients obtained during the main experiment (ibid.: 213).

2.5 Exposure to L2 Outside the Classroom

The amount of exposure to L2 outside the classroom was identified as a potentially confounding variable at the design stage of our project. Our subjects were resident in Dublin throughout the duration of the TCD English language course and were therefore exposed to some amount of L2 outside the classroom. Since Poles were the most dominant migrant group in Ireland in the two years preceding 2008, we could not assume that the patterns of exposure to L2 would have been similar for all of our subjects. A considerable number of the Polish migrants that we had interviewed in 2006 and 2007, in the context of a larger project, reported that they could go about their daily routines interacting mainly in their L1. They pointed to the fact that a large number of services were available in Polish (Polish shops, Polish schools, Catholic church services in Polish, Polish legal advice, Polish film festivals, etc.). Some of them indeed reported socialising principally with other members of the Polish community in Ireland. Among the Poles we had interviewed prior to 2008, there were, however, also a number of individuals who reported interacting mainly through English and using Polish hardly at all on a daily basis (cf. Skrzypek et al. in press).

We addressed the variable of out-of-class exposure by taking account of it. Such exposure was defined as interaction in English via face-to-face communication, via the telephone or on the Internet, but as including also watching TV, listening to the radio and reading in English. Exposure was measured in terms of hours per day between Time 1 and Time 2. The subjects were asked to keep a diary for six weeks (one selected week of each month during the TCD English language course), in which they were requested to note the number of hours of exposure to L2 outside the classroom per day. Our subjects were instructed not to include any TCD language course-related activities (such as homework) in their estimations of exposure.

2.6 Probing Cross-Linguistic Influence in Respect of Collocational Use

At the end of the TCD language course the subjects were requested to write a composition outlining their plans for the future. The A2 and B1 students were asked to write a minimum of 200 and 350 words respectively. The total number of words was counted and partialled out from relevant analyses. The number of cross-linguistic errors in relation to collocational usage was calculated for each

individual along with the number of correct collocations. The framework adopted here for classifying collocations is the BBI typology (Benson et al. 1986) according to which collocations can be divided into two main types—grammatical and lexical. Grammatical collocations are those that consist of an open and a closed class word (e.g. adjective + preposition), while lexical collocations are composed of open class words (e.g. verb + noun). The present study takes account of both types.

2.7 PSTM Tasks: Serial Nonword Recall and Recognition

For the purpose of this study two operational definitions of phonological STM capacity were formulated—one involving articulation of lists of nonwords and the other involving passive recognition sets of nonword lists.

The two operational definitions of phonological STM adopted here are as follows:

1. Serial nonword recall performance—the ability to retain and repeat L1-based nonword lists of varying lengths immediately after the presentation of each list with the correct nonword order maintained at Time 1 and Time 2;
2. Serial nonword recognition performance—the ability to retain pairs of sets of L1-based nonword lists of varying lengths and to judge, immediately after the presentation of a given set, whether the nonwords within each set are presented in the same order at Time 1 and Time 2.

It should be pointed out that from a methodological perspective there are merits to using two PSTM measures instead of relying on one measure exclusively (Gathercole and Pickering 1999). One of the merits stems from the fact that, contrary to the earliest writings on the subject, phonological STM tasks do not provide a pure measure of the construct. Apart from memory functions phonological STM tasks are also known to tap other processes, such as e.g. speech-motor output processing (Gathercole 2006a: 528–531). One of the implications of this is that, for example, some individuals might obtain substantially lower serial nonword recall scores than their 'true' PSTM score as a result of some minor articulation problems. To ensure that the PSTM capacity of subjects with some (even minimal) output problems is not underestimated by using a recall measure only, the use of serial nonword recognition alongside Serial Nonword Recall has been strongly recommended (Gathercole et al. 1999: 66). In subjects who do not have any output problems, the two measures should be highly correlated (provided that nonwords of low wordlikeness are used; wordlikeness ratings reflect the degree to which novel syllable sequences resemble existing words).

The serial nonword recall task used in this study consisted of three sets of nonword lists, each made up of 15 lists of the same length. Set one, two and three contained 2-item, 3-item and 4-item lists respectively (see Skrzypek 2010:

288–289). Before the commencement of the task the subjects were involved in a 5-min trial session during which they were familiarized with the task procedure. No corrective feedback was provided during testing. The measure of performance on the serial nonword recall test was the number of correctly repeated lists across all list lengths tested. A repeated list had to contain no mistakes to be accepted as correct. The testing was discontinued if a subject failed to repeat eight out of 15 lists of a given length.

The serial nonword recognition task was comprised of 30 pairs of nonword lists with 10 pairs of nonword sequences associated with each of three list lengths, that is at 4-item, 5-item and 6-item lengths (see Skrzypek 2010: 290–291). The position of each nonword was controlled to ensure the nonwords occurred in a variety of positions within the pool of lists. In the case of each list length, five of the ten pairs of nonword sequences were identical and the remaining five shared exactly the same nonwords but two of the nonwords in question were transposed in the second sequence. The initial and final pseudowords never changed their position. The participants were instructed to listen to each set of lists and tick either "the same" or "different" (or "not sure") on a designated webpage. The subjects were told they would listen to each set only once. 1 point was allocated for a correctly recognised set of lists as either the same or different.

A detailed description of the process of creating and testing nonwords is provided in Skrzypek (2010, 2013) along the explanation why these nonwords were based on L1 (Polish) phonotactics.

3 Results and Discussion

Prior to our main analysis, graphic and numerical methods were employed in order to test the assumptions of parametric data. Each distribution was checked for outliers using histograms, boxplots and normality plots. Skewness and kurtosis values in each distribution were transformed to z-scores in order to confirm that they were statistically different from zero. Additionally, the Shapiro-Wilk normality test was calculated for each dataset. Before the calculation of correlations and *t*-test scores were undertaken additional assumptions were checked—the assumption of linearity (scatterplots) with respect to correlations and the assumption of homogeneity of variance (Levene's test) with respect to t-tests. All sets of data reported below were found to be normally distributed, with no outliers present (see Skrzypek 2010, for more information).

3.1 PSTM Characteristics of the Participants

The lowest score obtained on the serial nonword recall task was 6 lists at both proficiency levels. The highest scores were 25 and 30 lists in the A2 and B1 groups

Table 3 Serial nonword recall and recognition scores at Time 1

Measures	Relevant statistics	A2 (n = 30)	B1 (n = 30)
Serial nonword recall	k	45	45
	M	15.63	17.53
	Min /Max	6/25	6/30
	SD	4.944	6.257
	Shapiro-Wilk	$D(30) = 0.979, p > 0.05$	$D(30) = 0.978, p > .05$
	Skewness	$-0.087, ns$	$-0.038, ns$
	Kurtosis	$-0.644, ns$	$-0.584, ns$
	Half-split reliability	0.918	0.897
Serial nonword recognition	k	30	30
	M	16.43	18.07
	Min /Max	9/24	10 /25
	SD	3.839	3.912
	Shapiro-Wilk	$D(30) = 0.979, p > 0.05$	$D(30) = 0.975, p > 0.05$
	Skewness	$0.036, ns$	$-0.235, ns$
	Kurtosis	$-0.694, ns$	$-0.644, ns$
	Half-split reliability	0.831	0.704

respectively. Serial nonword recognition scores ranged from 9 to 24 in the A2 group and from 10 to 25 in the B1 group. The means of A2 and B1 Serial Nonword Recall scores were found to be not statistically different ($t(58) = -1.30, p > 0.05$), and a similar situation of non-significance was found for the difference between the means of the A2 and B1 Serial Nonword Recognition scores ($t(58)= -0.63, p > 0.05$). Serial Nonword Recall and Recognition scores were found to correlate at the 0.001 level in both proficiency groups ($r = 0.683$ and $r = 0.645$ in the A2 and B1 group respectively).

The split-half reliability coefficients for serial nonword recall at Time 1 (Spearman-Brown for unequal length) proved very high in the A2 and B1 groups, 0.918 and 0.897 respectively (see Table 3). The split-half reliability coefficients for serial nonword recognition at Time 1 (Spearman-Brown for equal length) turned out to be satisfactory (.831 and .704 for the A2 and B1 scores respectively), but not as good as the Serial Nonword Recall reliability coefficients. The reliability coefficients of the serial nonword recognition measure were found to be lower than we would ideally have wished for, despite our having adhered to guidelines that have been followed by other PSTM researchers using nonword tasks.

3.2 The Distribution of L2 Collocation, Exposure and Cross-Linguistic Scores

The number of cross-linguistic errors in both proficiency groups ranged from 0 to 8 (see Table 4). The mean scores in the A2 and B1 groups were 3.25 and 2.56 respectively. These results appear to indicate that on average A2 learners tend you

Table 4 Means and standard deviations of collocation, exposure and cross-linguistic scores

	Measures	Minimum	Maximum	Mean	Standard deviation
A2 (N = 24)	Collocations (2)	4	33	16.33	6.519
	Correct collocations (2)	2	23	10.33	5.708
	Incorrect collocations (2)	1	12	5.54	3.021
	Cross-linguistic errors in collocations (2)	0	8	3.25	2.152
	Number of words (2)	221	463	328.46	56.688
	Exposure to L2 (1–2)[a]	1	8	4.34	2.235
B1 (N = 25)	Collocations (2)	10	24	15.40	4.349
	Correct collocations (2)	4	16	9.60	3.686
	Incorrect collocations	1	13	5.84	3.158
	Cross-linguistic errors in collocations (2)	0	8	2.56	1.981
	Number of words (2)	285	509	370.64	49.842
	Exposure to L2 (1–2)[a]	2	9	5.4	2.204

Note the numbers after variables denote testing time, i.e. 1—Time 1, 2—Time 2, 1–2—between Time 1 and 2
[a] Hours of exposure to L2 (English) per day

produce a higher number of cross-linguistic errors than B1 learners. After each composition was truncated to the same length (220 words), the mean score in the A2 group remains higher than the mean score in the B1 group (3.05 and 2.12 respectively).

Exposure scores in the A2 and B1 groups ranged from 1 to 8 and 2 to 9 h per day respectively. The mean exposure score in the A2 group was 4.4 h/day, while the mean exposure score in the B1 group was 5.4 h/day. The B1 group appears to have had one hour more of exposure to L2 per day than the A2 group did, but the difference between the group means was statistically not-significant ($t(58) = -1.74$, $p > .05$).

The mean number of correct collocations produced in the A2 and B1 group is 10.33 and 9.60 respectively. Our data indicate that A2 learners tend to produce a higher proportion of grammatical collocations (96 %) than B1 learners (68 %). The usage of lexical collocations is rather limited in A2 learners in this particular sample (4 %). Sample collocations produced by A2 and B1 learners are presented in Table 5.

3.3 Simple Intercorrelations Among Principal Measures

In the A2 and B1 groups the serial nonword recall scores and the serial nonword recognition scores were highly correlated (both ps < .001) (see Table 6), which corresponds to the results obtained in our pilot study (Skrzypek 2010, Chap. 5) and in other studies (Gathercole and Pickering 1999; but compare Martin 2009).

Table 5 Examples of collocations produced by A2 and B1 learners in writing

	Collocations in A2 writing	Collocations in B1 writing
Correct grammatical collocations	*by car, on foot*	*in trouble, keen on*
Correct lexical collocations	*have dinner, work hard*	*keen photographer, work hard, small fortune*
Cross-linguistic errors in L2 collocations	*in TV (w telewizji), *stay for a night (zostać na noc), *listen music (sluchać muzyki), *today morning (dziś rano)*	*in TV (w telewizji), *on my bank account (na koncie bankowym), *in Internet (w internecie), pay for rent (zapłacić za czynsz)*
Incorrect L2 collocations [a]	*for this moment, *go to holiday, *on next year, *get first communion, *play on chess*	*make reaction, *at all the time, *waste money for*

[a] Errors in L2 collocations attributable to cross-linguistic influence and errors in L2 collocations not attributable to cross-linguistic influence

Table 6 Simple intercorrelations among principal measures in the A2 and B1 groups (Pearson product-moment correlation coefficients)

Groups	Variables		1	2	3	4	5
A2	1. Serial recall (1)	Pearson r	___				
		Sig.					
	2. Serial recognition (1)	Pearson r	.683***	___			
		Sig.	.000				
	3. Exposure to L2 (1–2)	Pearson r	.281	.294	___		
		Sig.	.133	.115			
	4. Cross-linguistic errors (2)	Pearson r	−.430*	−.390	−.057	___	
		Sig.	.032	.054	.763		
B1	1. Serial recall (1)	Pearson r	___				
		Sig.					
	2. Serial recognition (1)	Pearson r	.645***	___			
		Sig.	.000				
	3. Exposure to L2 (1–2)	Pearson r	.555**	.185	___		
		Sig.	.001	.328			
	4. Cross-linguistic errors (2)	Pearson r	−.146	.122	−.480**	___	
		Sig.	.485	.561	.007		

Note the numbers after variables denote testing time, i.e. 1—Time 1, 2—Time 2, 1–2—between Time 1 and 2

* $p < .05$ level, ** $p < .01$ level, *** $p < .001$ (2-tailed)

A correlation of this magnitude would normally be interpreted as an indication that selected phonological STM measures tap the same construct. However, it should be pointed out that the data obtained from this particular sample of subjects (reported in e.g. Skrzypek 2009; Skrzypek and Singleton 2013b) revealed some

potential problems with using a recall-based measure to tap phonological STM in adults. The issue of construct validity of recognition-based measures of phonological STM has already been highlighted in Skrzypek (2013) and will therefore will not be touched upon in the current paper.

The first research question addressed in this paper relates to the posited relationship between individual differences in PSTM capacity and cross-linguistic influence at the A2 level of proficiency. The data from written L2 compositions in the A2 group indicate that there is a relationship between phonological STM tapped by serial nonword recall and cross-linguistic errors ($r = -0.430$, $p < 0.05$). This correlation remains significant when the number of words is partialled out ($r(21) = -0.483$, $p < 0.05$). This finding is in line with the results obtained in Skrzypek and Singleton (2013a) in relation to phonological STM and cross-linguistic errors in an end-of-course L2 collocation test at the A2 level of proficiency. This implies that as phonological STM capacity decreases, the number of cross-linguistic errors increases. The correlation between phonological STM tapped by serial nonword recognition is also negative, but it should be noted that the correlation is marginally non-significant ($r = -0.390$, $p = 0.054$).

The second research question addressed in this paper examines the relationship between PSTM capacity and the number of cross-linguistic errors at a higher level of L2 proficiency (i.e. B1). The picture obtained in the B1 group is different from that obtained in the A2 group. The data from written L2 compositions in the B1 group do not support the existence of a relationship between PSTM and cross-linguistic errors. Serial nonword recall does not correlate with cross-linguistic errors ($r = -0.146$, $p > 0.05$) and neither does serial nonword recognition ($r = 0.122$, $p > 0.05$). It could be concluded, therefore, that lower phonological STM capacity has a very limited impact, if any at all, on the extent to which B1 learners fall back on their knowledge of L1 collocations when dealing with L2 collocational challenges.

As for phonological STM and exposure to L2 outside the classroom, the existence of a significant relationship between these variables is a complicating factor. In the A2 group the correlations between phonological STM measures and exposure to L2 are non-significant (ps < 0.05). However, in the B1 group the correlation between serial nonword recall and exposure to L2 is significant at the .01 level. This indicates that the B1 students with higher serial nonword recall scores reported receiving a significantly higher amount of exposure to L2 outside the classroom as compared to the B1 students with lower serial nonword recall scores ($t(28) = -2.87$, $p < 0.01$). This complication could not have been prevented from arising, as our experimental design did not allow us to control the amount of L2 our subjects were exposed to outside the classroom between Time 1 and 2. Factors such exposure can be most accurately controlled in a laboratory setting. In order to disentangle the impact of exposure and PSTM capacity on the operation of cross-linguistic influence, a laboratory-type study would have to be carried out.

4 Conclusion

The results obtained in the current study indicate that at the elementary (A2) level of L2 proficiency there is a link between individual differences in PSTM capacity and the operation of cross-linguistic influence evidenced in attempts to produce L2 collocations in writing. The data suggest that the lower the phonological STM capacity (as measured by L1-based serial nonword recall), the higher the number of errors that can be attributed to cross-linguistic influence. Since PSTM capacity appears to have an impact not only on the efficiency with which syllables are chunked into words but also the efficiency with which words are chunked into collocations (Skrzypek 2009), it therefore follows that when L2 collocational resources are lacking A2 learners tend to fall back on their knowledge of L1 collocations.

With regard to the pre-intermediate (B1) level of L2 proficiency, the data do not support the existence of a strong relationship between phonological STM and cross-linguistic errors. Our data reveal a week negative correlation between serial nonword recall and cross-linguistic scores, which is nonetheless non-significant. It would appear, therefore, that at the B1 level of proficiency adult learners with a lower phonological STM capacity are not more likely to produce a higher number of cross-linguistic errors. This may be linked to the fact that at this level of L2 proficiency, adult B1 learners have a richer array of L2 resources to draw on than A2 learners, and they are more likely to produce other types of errors such as, for example, intralingual errors.

On a final note, it should be perhaps highlighted that the data elicited from this particular sample of subjects (reported in e.g. Skrzypek 2009; Skrzypek and Singleton 2013b) revealed some potential problems with using a recall-based measure to tap phonological STM in adults. These problems relate to both how the two measures are conceptualized within the multi-component WM model (see Baddeley 2003) and to whether the recognition measure in fact taps the same construct in adults as it is believed to tap in children. We feel it is essential that the issue of construct validity of the serial nonword recognition task be explored in future studies when this is used in an adult population (for further information see Skrzypek and Singleton 2013b).

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Another Look at Temporal Variation in Language Learning Motivation: Results of a Study

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Abstract According to Dörnyei (2005), research into second language learning motivation has entered what could be labeled as the *process-oriented period*, in which the emphasis has been shifted from the investigation of learners' motives and the magnitude of their efforts to the study of how these change in the course of time. There are still few studies, however, that have attempted to look at motivational change, particularly such that would tap into fluctuations in learners' interest, engagement and effort over the course of a language lesson or a sequence of successive lessons. The present chapter aims to extend our scant knowledge in these areas by reporting the findings of a study which sought to explore motivational evolution in 38 vocational senior high school learners of English, looking both at their reasons for learning, longer-term involvement and engagement in four lessons, and, as such, it can be viewed as a follow-up on the research project undertaken by Pawlak (2012). The data were collected by means of multiple tools, namely: (1) detailed lesson plans, (2) interviews with selected participants conducted twice over the period of the study, (3) motivation grids filled out at five-minute intervals during a specific class, and (4) teachers' and learners' evaluations of the lessons involved. The data were subjected to quantitative and qualitative analyses which revealed that motivation is indeed in a state of flux and identified some factors potentially responsible for such temporal variation.

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1 Introduction

As Dörnyei (2005: 83) comments in his overview of individual differences in second language acquisition, "(…) when motivation is examined in its relationship to specific learner behaviors and classroom processes, there is a need to adopt a *process-oriented approach/paradigm* that can account for the daily ups and downs of motivation to learn, that is, the ongoing changes of motivation over time. Even during a single L2 class one can notice that language-learning motivation shows a certain amount of changeability, and in the context of learning a language for several months or years, or over a lifetime, motivation is expected to go through rather diverse phases". Since empirical investigations into the dynamic nature of motivation are still in their infancy, particularly with respect to how learners' effort and engagement change in the course of a language lesson or a sequence of such lessons, the study reported in this chapter, which was to a large extent a follow-up on the research project undertaken by Pawlak (2012), aimed to offer insights into this issue by exploring the temporal variation in the intensity of the motivation of Polish vocational senior high school learners. At the outset, theoretical support for adopting a process-oriented view of language learning motivation will be provided and a brief overview of research into the dynamic nature of motivation conducted to date will be offered. This will be followed by the description of the research project, including its participants, the methodology used and the analytical procedures applied, as well as the presentation and discussion of the findings. The article will close with suggestions as to how similar studies should be most beneficially carried out in the future and how the findings of such empirical investigations can inform second and foreign language teaching.

2 Theoretical Support for a Process View of Motivation

The fact that motivation is a dynamic factor rather than a stable attribute of a learner has been recognized in a number of theoretical proposals focusing on the contribution of this crucial individual difference variable to the process of learning second or foreign languages. Williams and Burden (1997), for example, identify three stages of motivation as a process in language learning, that is: (1) *reasons for doing something*, (2) *deciding to do something,* and (3) *sustaining the effort and persisting*, the first two of which are related to initiating a particular activity, and the last is connected with persevering in the pursuit of the envisaged goal. A very similar stance is adopted by Dörnyei and Ottó (1998), who propose a model of motivational evolution that accounts for how learners' initial wishes and desires serve as a basis for the determination of goals which then get transformed into intentions which, in turn, provide an impetus for specific actions, intended to lead to the attainment of the goals set, with the entire process finally being subjected to evaluation. They distinguish the following three distinct phases of this process:

(1) *the preactional stage*, in which the impulse to engage in learning activity appears and thus it is possible to talk about *choice motivation* that results in choosing specific goals or tasks to be tackled, (2) *the actional stage*, in which steps are taken to ensure that the motivation generated in the previous phase is maintained and protected, a task that poses a considerable challenge in classroom settings, and thus this dimension can be called *executive motivation*, and (3) *the postactional stage*, which can be referred to as *motivational retrospection* and involves evaluation of what has transpired in the process of language learning, bringing with it crucial consequences for the learning activities pursued in the future.

The temporal nature of motivation is also postulated by Ushioda (1996, 2001), who argues that in the case of institutionalized learning motivation is bound to fluctuate over time on account of the fact that learners' goals will inevitably be subject to modifications in response to the positive and negative experiences that are part and parcel of learning second or foreign languages in a classroom setting. Such a process-oriented conceptualization of motivation is also in line with the theory of the L2 motivational self-system (cf. Csizér and Dörnyei 2005; Dörnyei 2009), which is predicated on the assumption that Gardner's (1985) concept of integrativeness is inadequate in contexts where learners have little contact with native speakers and thus language learning motivation should be considered in terms of: (1) *ideal L2 self*, which is related to the skills and abilities that learners aspire to possess, with the outcome that they are intent on diminishing the distance between the imagined and actual self, (2) *ought-to self*, which concerns the attributes that the learner thinks he or she should possess in order to live up to the expectations of others or to ward off negative consequences, and (3) *L2 learning experience*, which is connected with the immediate learning environment and is thus heavily dependent on a particular situation. Clearly, all of these components are likely to be subject to modifications over time because learners unavoidably change their minds as to what exactly they would like to achieve, external expectations can come and go, and all the elements that make up the learning environment (e.g. the teacher, curriculum, peer group) can hardly be expected to remain stable for the duration of a language course, not to mention the whole duration of language learning.

The constant fluctuations in motivation to learn second or foreign languages can also be explained in terms of Vygotsky's (1978) sociocultural theory, which provides a basis for assuming that this motivation is socially constructed in the process of interacting with more proficient users of a particular language (i.e. more knowledgeable others), with these interactions potentially leading to the development of culturally valued goals and intentions, and, consequently, triggering greater effort (e.g. Rueda and Moll 1994; Bronson 2000; Norton and Toohey 2001; Ushioda 2008). Support for the process-oriented view of language learning motivation also stems from dynamic systems theories (Larsen-Freeman and Cameron 2008; de Bot et al. 2007, 2013), which account for the fact that both learners' motives, effort and involvement in the process of language learning are

likely to undergo considerable changes as a result of the influence of a wide range of internal and external factors, which are intricately interrelated and are themselves subject to considerable fluctuations. In the words of Ushioda (2008: 25–26), "[t]his Vygotskian perspective illuminates how motivation 'from within' can be fostered through the formulation of shared intentions and purposes (rather than exclusively teacher-imposed goals). It also highlights the way in which motivation develops through social participation and interaction".

3 Previous Research on the Dynamics of Language Learning Motivation

Although theorists and researchers emphasize the need to explore the dynamic nature of motivation to learn second and foreign languages, research projects in this area are still few and far between, and they focus in the main on the changes in the motives of language learners over a longer period of time rather than fluctuation in their effort and engagement in specific language lessons or sequences of such lessons. In one of the first studies addressing this issue, Koizumi and Matsuo (1993) investigated the evolution in the attitudes and motives of Japanese seventh-grade learners, providing evidence for a decrease in motivation over the period of seven months, after which time stabilization seemed to set in and more realistic goals started to be pursued. A similar trend was reported by Tachibana et al. (1996), who investigated the changes in the motivation of Chinese and Japanese pupils, and reported that in both cases there was a decline in the interest in learning English from junior to senior high school. A drop in the level of motivation over time was also observed by Gardner et al. (2004), who investigated the motivation of Canadian university students learning French and found that it decreased from the fall to the spring, with situation-specific motives, such as attitudes towards the learning situation, being much more vulnerable to changes than more general ones, such as integrativeness. Evidence for the decline in the intensity of learners' motivation over time also comes from the studies undertaken by Inbar et al. (2001), which investigated the learning of Arabic in Israel, as well as those carried out by Chambers (1999) and Williams et al. (2002), both of which focused on language learners in Great Britain.

Research projects have also been undertaken which attempted to provide insights into the changes in the nature of learners' language learning motivation over time, such as those conducted by Ushioda (2001), Shoaib and Dörnyei (2005), Hsieh (2009), Kim (2009), and Nitta and Asano (2010). Ushioda (2001) showed that Irish young adult learners of French modified their goals over the period of 16 months in response to learning experiences and they were successful in making them more specific and more compatible with their personal objectives. Shoaib and Dörnyei (2005), in turn, traced different motivational influences by means of interviews conducted over the period of twenty years and pinpointed a number of motivational transformational episodes that were responsible for major changes in

the nature of motivation, with six temporal themes emerging as the most influential, namely: becoming more mature and more interested, standstill periods, entering a new phase of life, transforming extrinsic goals and visions into intrinsic ones, relationships with significant others, and the time spent in the environment where the target language is spoken. Hsieh (2009) conducted a case study in which two Taiwanese learners were interviewed before and after participating in a one-year long study abroad program and found that "(…) L2 motivational dispositions consist of many interacting factors that evolve over time" (2009: 17). More specifically, the analysis grounded in the theory of L2 motivational self system (Dörnyei 2009) demonstrated that participants' goals, attitudes and self-concepts were subject to considerable modifications in response to a host of internal (e.g. insufficient target language ability) and external (e.g. fear of failing a course) factors. In another case study, Kim (2009) investigated the dynamic nature of motivation of four Korean learners of English as a second language, forging an important link between Dörnyei's (2005, 2009) second language self system and Vygotsky's (1978) sociocultural theory. The analysis of the data gleaned from semi-structured interviews conducted with each of the participants over a ten-month period revealed that motivation is a dynamically evolving process and pointed to the need to internalize and personalize external reasons for learning an additional language as only then is it possible to transform students' ought-to L2 self into their ideal L2 self as well as integrating the initial motives to learn an L2 with specific goals and sense of participation. Finally, Nitta and Asano (2010) examined the transformations in the choice and executive motivation manifested by Japanese students over the period of a one-year course and discovered fluctuations in these two areas which were due to the impact of both social and interpersonal factors, such as the teacher's teaching style, intergroup relations as well as group cohesiveness.

As mentioned at the beginning of this section, research into the changes in the magnitude of learners' motivation in the course of a single language class or a series of such classes is still scant. Some insights into this issue come from the study conducted by Egbert (2003), who investigated the role of flow (Csikszentmihalyi 1990) in second language learning and succeeded in determining the task conditions the presence of which is likely to induce such a state, which were as follows: (1) the existence of a perceived balance between the challenge posed by a specific task and the abilities and skills of the participants, (2) the provision of opportunities for heightened levels of concentration and attention to the pursuit of specific task goals, (3) the perception of the task as interesting and authentic, and (4) the participants' sense of control over the process of performing the task and the outcomes achieved. A study that focused specifically on changes in motivational intensity over the course of a lesson and that in fact provided an impetus for the present research project was carried out by Pawlak (2012) in the context of Polish senior high school. The analysis of the quantitative and qualitative data collected by means of a motivation questionnaire designed on the basis of the theory of L2 motivational self system (Dörnyei 2009), semi-structured interviews with selected participants, motivation grids in which the

subjects were supposed to indicate the levels of their interest at five-minute intervals, and lesson evaluations completed by students and their teacher revealed that both the nature and intensity of motivation tended to evolve over time. As Pawlak (2012: 273) explains, "[s]uch fluctuations were detected both over a longer period of time, as demonstrated by the learners' comments in the interviews, and, at least to some extent, in the course of single lessons, as shown by the participants' assessment of their interest and engagement at 5-min intervals". However, the research project failed to provide evidence for changes in motivational intensity from one language lesson to another and the complexity and sometimes contradictory nature of the findings precluded drawing clear-cut conclusions concerning factors responsible for motivational change, drawbacks that the researcher attributed to the design of the study, the shortcomings of the data collection tools used, as well as the fact that the data were collected by the regular classroom teacher. Since the research project reported below was a follow-up to this study and employed very similar methodology, it provided the researchers with the opportunity for further validation of the instruments used in a slightly different educational context and with a different group of language learners.

4 The Study

4.1 Research Questions

The research project set out to investigate the dynamic nature of motivation by tracing its fluctuations in the course of single lessons and sequences of lessons, and, as such, it focused primarily on changes in motivational intensity and, to a lesser extent, on the nature of language learning motivation, or, to use the labels included in the process model of motivation proposed by Dörnyei and Ottó (1998), it addressed mainly learners' executive motivation, but also provided some insights into their choice motivation. For the purposes of this study, following Crookes and Schmidt (1991) and Peacock (1997), motivation was defined in terms of interest in and enthusiasm for learning tasks being performed, persistence, and levels of concentration and enjoyment. The justification for such an approach is offered by Ushioda (1993), who refers to it as 'practitioner validated' and makes the point that high levels of enthusiasm and participation are invaluable, as well as Cowie and Sakui (2011: 124), who found that, in the opinion of their teachers, "(…) motivated students demonstrate a set of specific behaviors in the classroom, such as showing enthusiasm and effort, working on task and working independently". When it comes to the nature of learners' motives for learning English, their evolving nature and the degree to which they can be related to what transpires in the language classroom, it was investigated adopting as a point of reference the theory of L2 motivational self system (Dörnyei and Csizér 2002; Dörnyei 2009). The analysis of the data was guided by the following research questions:

- What are the students' motives in learning English and how do these motives change over time?
- How do levels of motivation change in the course of a lesson and a sequence of lessons?
- What factors are responsible for these changes?

4.2 Participants

The participants were 38 vocational senior high school learners, 4 females and 34 males, in the second and third year of the program, who, in accordance with the policy of the school were divided into three groups for the purpose of learning English: Group 1 (grade 2)—14 students, Group 2 (grade 2)—10 students and Group 3 (grade 3)—14 students. Although there was considerable individual variation in this respect, on the whole, the subjects could be said to have represented a pre-intermediate level of proficiency, or approximately A1 according to the *Common European framework of reference for languages*, but most of them were rather weak in their command of English and they were not very motivated to learn the target language. When it comes to their mean semester grades in English, they amounted to 2.38 (Group 1), 2.6 (Group 2) and 2.21 (Group 3) on a scale of 1 (lowest) to 6 (highest), which testifies to the fact that the three groups were to a large extent comparable and the learning outcomes were poor. The learners in Groups 1 and 2 had two English lessons a week, whereas those in Group 3 had the benefit of three classes a week and it can be assumed, based on the experience of the authors, that at least some of them attended additional tutoring sessions, which, however, cannot be interpreted as providing evidence for higher levels of motivation.

4.3 Design of the Study

The study was conducted over the period of two weeks in the course of four regularly scheduled English classes, all the groups were taught by the same teacher and they covered the same material included in the successive units of the course book. In order to obtain information about fluctuations in the participants' motivation, both with respect to its intensity during a single lesson, a sequence of lessons and over a longer period of time, as well as the motives leading them to invest effort in the task of learning the target language, multiple data collection tools were employed, as follows:

- *detailed lesson plans* provided by the teacher; they were the same for the three groups, although they may have been implemented in a slightly different order;
- *a motivational grid*, where the subjects were requested to indicate the levels of their interest and engagement in what transpired in a given class at five-minute intervals on a scale of 1 (minimum) to 7 (maximum); they marked their

responses on cue in the form of a prerecorded beep and they could also make some additional comments in the space provided at the end of the grid; the value of Cronbach's alpha for the first lesson in the three groups oscillated around 0.80, which testifies to high internal consistency reliability of the tool;

- *an evaluation sheet*, which was a somewhat modified version of the instrument used by Peacock (1997) and required the participants to indicate their interest in a particular lesson after it had been completed by responding to seven items incorporating a semantic differential scale (e.g. interesting vs. boring, pleasant vs. unpleasant, attractive vs. unattractive), with the positive adjectives being placed first in some questions and second in others; it should also be emphasized that the instrument was in fact based on a seven-point Likert-scale because the extreme negative response was accorded the value of 1 (e.g. unattractive), the extreme positive response the value of 7 (e.g. attractive), with the remaining answers falling in between; the internal consistency of this tool was determined by calculating Cronbach's alpha, which also in this case was satisfactory as it stood at about 0.77 in all of the groups involved in the study;

- *a questionnaire for the teacher*, a tool that was also partly adapted from Peacock (1997) and contained a total of eight items that had to be responded to on a seven-point Likert scale (i.e. 1—lowest, 7—highest) after each class; the questions were related to the teacher's perspective of what happened in the course of the lesson and pertained to such areas as the learners' interest, effort, engagement, enjoyment, concentration, attention, the level of difficulty that a specific class posed, and its appropriacy for a particular group;

- *interviews with 12 students* selected from the three groups, held half way through and at the end of the study with a view to tracing changes in the intensity and nature of motivation as well as identifying factors accountable for modifications in this respect; the interviews were supposed to provide insights into the reasons for learning English, opinions about the classes analyzed for the purposes of the study as well as tasks they comprised, and changes in motivation, both with respect to the rationale for learning English and the level of engagement; the interviews were conducted by the regular classroom teacher, the interactions were digitally audio-recorded and then transcribed.

All the tools had been piloted prior to the study conducted by Pawlak (2012) with a group of senior high school students and they were modified with an eye to enhancing their validity and reliability. It should also be pointed out that Polish, the participants' mother tongue, was used in the instructions, the items included in the questionnaires and the interviews on account of the fact that the learners would have experienced considerable difficulty in understanding questions in the target language and expressing their intended ideas in English would have been close to impossible.

As can be seen from Fig. 1, which provides a graphical representation of the schedule for the administration of the data collection tools, the motivation grids as well as the evaluations sheets for the learners and the questionnaires for the teacher were completed for all of the four classes included in the present study. The interviews with the 12 students selected from all the participants were conducted
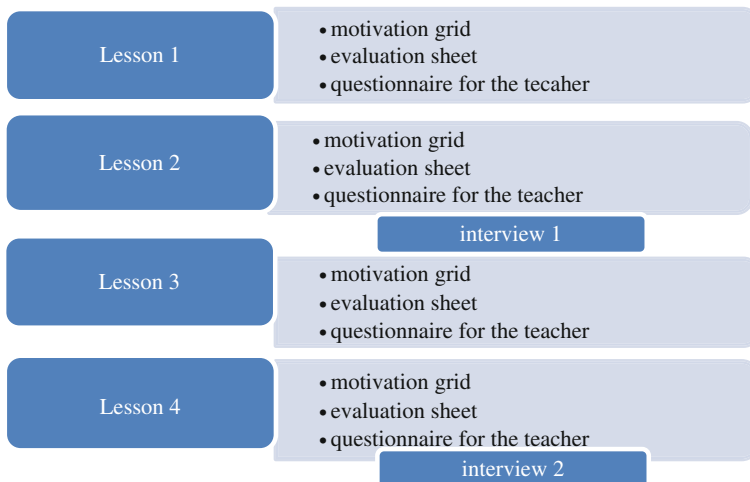
Fig. 1 Graphical representation of the schedule for the administration of the data collection tools

after the second and fourth lesson, with the interval of about ten days between them. The data collected by means of these tools were analyzed both quantitatively and qualitatively, with the choice of specific procedures being contingent on the nature of the information obtained. Quantitative analysis involved: (1) computing the means and standard deviations for the items included in the motivation grids, (2) tabulating the means and standard deviations for the responses included in the evaluation sheets and the teacher questionnaires, and (3) comparing overall means from the evaluation sheets with the assessments made in the teacher questionnaire. Whenever such a need arose, the statistical significance of the differences was established with the help of independent samples t-tests, with the desired level of significance being set at $p < 0.05$. Qualitative analysis entailed the following procedures: (1) detecting the recurring themes in the data collected by means of the interviews, with particular emphasis being laid on the evolution of the reasons for learning English with respect to Dörnyei's (2009) theory of second language motivational self system, modifications of motivational intensity over time, and the changes in the involvement in the four classes as well as the factors to which such changes could be ascribed, and (2) interpreting fluctuations in the magnitude of motivation with reference to the foci of the four classes, the stages they included, and the tasks and activities completed by the learners.

4.4 Results and Discussion

Insights into the participants' motives for learning English and the changes in this respect were yielded by the qualitative analysis of the data collected by means of

interviews. The main finding was that the actions taken by the learners when it comes to studying the target language were characterized by a high degree of instrumentality, comprising both a promotion (i.e. related to hopes, attainments and aspirations) and prevention (i.e. connected with the avoidance on unpleasant outcomes) regulatory focus (cf. Higgins 1989). This testifies to the fact that the participants pursued specific learning goals not only with an eye to achieving pragmatic gains that were important to them (e.g. getting a good job in the future), but also with a view to averting negative consequences (i.e. minimizing the danger of receiving a bad grade), as well as demonstrating the external nature of their motives, an outcome that should not be exceedingly surprising given the low levels of proficiency and involvement in all the groups (see the section devoted to the description of the participants). The following excerpts illustrate the huge impact of instrumental motives on the students' efforts in learning (all of the examples have been translated into English by the present authors):

- I am learning English because I want to communicate with others in my job. It gives a lot of possibilities (*promotion regulatory focus*).
- I would like to know this language as it will be required when I want to go to university. (…) I would like to have a basic command of English as it will be useful in the future (*promotion regulatory focus*).
- I am learning English to be better prepared for the future and to find a good, well-paid job (*promotion regulatory focus*).
- I do not see any particular reason but such knowledge is useful in life. You never know what can happen and what the future holds. There might be situations in which I will need English (*promotion regulatory focus*).
- I am learning English to get promoted to the next class (*prevention regulatory focus*).
- I do not want to be seen as the worst student in my class (*prevention regulatory focus*).

Although other motives for learning English could also be observed, they appeared much less frequently and they were sometimes confined to the contributions of single learners, with the effect that it is difficult to talk about clear-cut patterns in this case. These motives included, in the order of frequency with which they were mentioned in the interviews, international posture (i.e. students' view of English as a tool for communication with foreigners), L2 learning experience (i.e. the degree to which learners enjoy learning English in a particular situation), ideal L2 self (i.e. learners' perceptions of themselves as successful users of a foreign language), and knowledge orientation (i.e. learners' opinions regarding the impact of a foreign language on broadening their knowledge about the world). The following excerpts illustrate some of these motives:

- At my friend's eighteenth birthday party I got to know a German girl, but she speaks English very well and my German is very poor so sometimes we talk to each other through Skype (*international posture*).

- I would like to extend my knowledge of English because in the future I would like to go abroad and this language will be useful in communicating with foreigners (*international posture*).
- Even before I started attending courses, I caught single words and started using them and this became a habit (…) I like this language so I am learning it and I think that I would learn even if I did not have to do it in school (*L2 learning experience*).
- I am coming to the conclusion that I will have to learn myself to improve my English because my level is not as high as I would like it to be. I would like to be able to use this language in different situations (*ideal L2 self*).
- I would like to deepen my knowledge about engines and mechanics, and English can help me (*i.e. knowledge orientation*).

The analysis also provided some evidence for the changes in the motives to learn English and the intensity of the participants' motivation, with such changes, however, being recognized by only a few the learners and most of the participants failing to observe any. The modifications were attributed to several causes, such as a memorable trip abroad, transition from one type of school to the next, promotion to the next grade, or the prospect of school leaving examinations. It should also be emphasized that such transformations were in the vast majority of cases connected with instrumentality and thus externally driven, and the reasons for learning English remained stable over time in most cases, although, it is likely that, due to their design and the manner of administration, the interviews may not have been sensitive enough a tool to fully capture changes in this respect. Relevant excerpts from students' interviews follow:

- I do see a change because earlier I was not very interested in learning English, like in the sixth grade of elementary school but in the second grade of junior high school I went to England where I had to speak English. This is when I noticed that English is really interesting (*i.e. a visit to an English-speaking country provided an impulse for a change in the magnitude of motivation*).
- I think that I have been more involved in learning English since I came to vocational senior high school but I cannot explain why (*the impact of transition to the next educational level*).
- I am in the third grade and the final examinations are coming. I would like to take English because my German is even worse, so I have to sign up for a course and improve my knowledge (*a change in motivational intensity due to upcoming exams*).
- At he beginning I did not apply myself to learning. I was only interested in passing and I was not very interested in learning this language and now I regret it because it is difficult to make up for the lost time. Now I understand that English is indispensable to communicate with foreigners in the European Union and all over the world (*a change in reasons for learning and intensity as a result of the realization of the importance of English*).
- I do not see any changes. I have always had the same approach and have been involved to the same extent, although it has not always found reflection in my grades (*one of many examples of failure to recognize changes*).

When it comes to the fluctuations in the intensity of the learners' motivation over the course of a language lesson and several lessons, it will be recalled from the previous section that they were explored by means of motivation grids, learner evaluations and teacher questionnaires, all of which were intended to offer insights into the participants' interest, involvement, enthusiasm and persistence. Since, due to space limitations, it is not possible to discuss all those data in detail, the emphasis here will only be placed on the most conspicuous patterns and it will be aided by the insights obtained from the interviews. For one thing, the levels of motivational intensity proved to be much lower here than in the study undertaken by Pawlak (2012), which used identical data collection instruments and the results of which were outlined in the previous section. The main reason for such differences appears to be that the previous study was conducted in general rather than vocational senior high school with learners who were much more motivated to achieve academic success, including the desire to excel in learning foreign languages, and manifested much greater command of English, which testifies to the importance of a specific context when exploring the temporal dimension of second language motivation. Another general observation is that the reported levels of interest and involvement were considerably higher in Group 3, comprising third-grade students, which can in all likelihood be attributed to the fact that they were growing increasingly aware of the prospect of their final examinations and, thus, they felt the need to pay more attention to what happened in the classroom, a tendency that is understandable given the focus on the prevention dimension of instrumentality that was revealed in the interview data discussed above.

The analysis of the ups and downs of motivational intensity during the specific lessons and particularly the possible reasons for such fluctuations poses a considerable challenge on account of the fact that the topics covered in Group 3, which comprised third-grade students differed from those in Groups 1 and 2, which were made up of second-grade learners, but even here, although the lesson plans were by and large the same, the classes were taught in a slightly different order. Lesson 1 in Group 3 was devoted to discussing the qualities of an ideal boyfriend, and involved speaking, listening and writing. As can be seen from Table 1 and Fig. 2, there was a gradual increase in motivational intensity throughout the class, with the difference between minutes 5 and 45 standing at 0.83. This pattern could be attributed to the topic of the lesson which the subjects apparently found very interesting and the most conspicuous increases could be observed between minutes 20 and 25 (by 0.33) when the learners started working on a listening task, and in the last 15–20 min of the lesson (by 0.33), as they focused on a writing activity inviting them to list the qualities of an ideal boyfriend or girlfriend. Lesson 1 in Group 1 focused on grammar and more specifically relative clauses, a topic that did not trigger much involvement on the part of the students, as demonstrated by the fact that the ratings never exceeded 3.08. Also in this case, motivational intensity increased by 0.4 when the teacher started explaining the relevant rules after the first ten minutes of the lesson and was retained at this level during the performance of the first exercise but then boredom apparently set in as the learners were requested to work on successive exercises, which is evident in the dip from

Table 1 Means for motivational intensity in Groups 1, 2 and 3 during the four lessons

| Minute/group and lesson	5	10	15	20	25	30	35	40	45
G1 L1	2.67	2.58	3.08	2.92	2.83	2.58	2.67	2.58	2.33
G2 L1	3.33	3.33	3.00	3.00	3.00	3.17	3.33	2.67	3.17
G3 L1	4.50	4.50	4.58	4.67	5.00	5.17	5.17	5.25	5.33
G1 L2	2.75	3.08	3.00	3.50	3.08	3.33	2.92	3.00	3.08
G2 L2	2.88	3.13	3.25	3.25	3.25	3.50	3.13	2.50	2.50
G3 L2	5.43	5.71	5.29	5.43	5.14	5.86	5.71	5.71	5.71
G1 L3	2.50	2.58	3.08	3.08	3.08	2.67	2.83	2.83	2.42
G2 L3	3.29	3.14	3.29	3.43	3.57	3.86	3.58	3.29	3.14
G3 L3	4.67	4.78	5.44	5.11	5.22	5.56	5.11	5.56	5.56
G1 L4	2.50	2.92	2.83	2.92	3.17	3.25	3.25	3.50	2.75
G2 L4	3.67	3.83	3.00	3.33	3.17	3.17	3.33	3.17	3.00
G3 L4	4.08	5.58	5.08	5.33	4.83	5.17	5.00	5.33	5.67

Fig. 2 Changes in motivational intensity in Groups 1, 2 and 3 during lesson 1
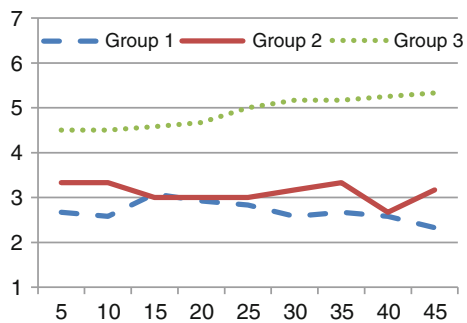
2.83 in minute 25–2.33 in minute 45. Finally, Lesson 1 in Group 2 involved performing a number of activities based on the story *The picture of Dorian Grey* but in this case the changes were rather small, with the exception of the drop of 0.66 from minute 35 to minute 40, which can perhaps be accounted for by the fact that the learners had grown tired of performing a sequence of tasks related to the same topic.

As indicated by the data in Table 1 and Fig. 3, there were few changes in the level of motivational intensity in Group 3 during Lesson 2, which was devoted to writing an informal letter, the only exception being an increase o 0.72 from minute 25 to minute 30, with this high level maintained almost till the end of the lesson, a phenomenon that can be related to the fact that during that time the learners were engaged in composing a letter on their own. Incidentally, the fact that the ratings during this lesson were considerably higher than those in Lesson 1 may speak to the participants' cognizance that they may be required to perform a task of this kind during their final examination. Lessons 2 in Groups 1 and 2 were concerned with the story of Dorian Grey and relative clauses, respectively. In the case of the former, there were visible fluctuations in the learners' interest and engagement,

Fig. 3 Changes in motivational intensity in Groups 1, 2 and 3 during lesson 2
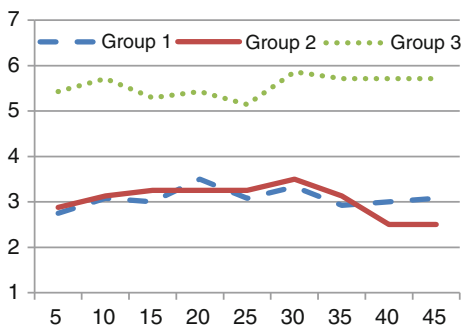

Fig. 4 Changes in motivational intensity in Groups 1, 2 and 3 during lesson 3
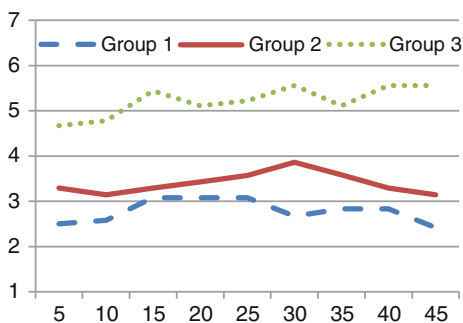
with an increase of 0.33 between minutes 5 and 10, as the teacher focused on evaluation, a further increase of 0.5 between minutes 15 and 20, as the students were requested to answer questions about the text, and then an abrupt drop of 0.48, which indicates that some degree of tedium was manifesting itself. When it comes to the latter, motivational intensity began to rise when a new point of grammar was introduced, it remained stable for about 20 min, increased by 0.25 with a transition to a new task from minutes 25 to 30, only to begin to drop towards the end of the lesson. It is interesting to note here that although the lesson plans followed in Groups 1 and 2 in Lessons 1 and 2 were identical, the levels of the learners' interest and involvement differed and there were divergences as well in the patterns of fluctuations. This indicates that it is not the topic or task type *per se* but also the individual characteristics of learners, group dynamics and the teacher's rapport with students that may play a key role in shaping the magnitude of language learning motivation.

Even greater evidence for minute-to-minute fluctuations in the participants' interest and involvement comes from the analysis of the data obtained by means of the motivation grids for Lessons 3 and 4 (see Table 1 and Figs. 4 and 5). Lesson 3 in Group 3 was devoted to discussing a text on school meals around the world and performing a number of activities based on this text. In accordance with the pattern observed during some of the previous lessons, there was a rise of 0.66 after the initial 10 min of the lesson during which the focus was on grades and assessing the

Fig. 5 Changes in motivational intensity in Groups 1, 2 and 3 during lesson 4
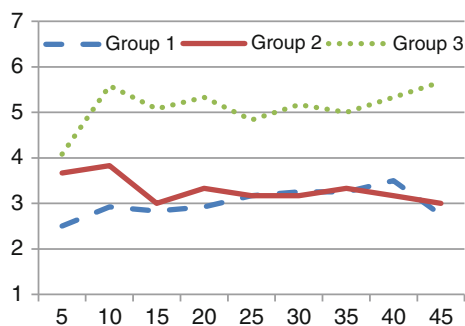

learners' performance, the teacher proceeded to the theme of the lesson, and the students were asked to describe a picture and answer a set of questions related to it. Although the level of involvement dropped somewhat afterwards, it remained relatively stable and was on the increase once again when the learners were asked to express their opinions about the food served in the school (a rise of 0.34 from minute 25 to 30) and, following a dip, it was at pretty much the same level till the end of the lesson. The focus of Lesson 3 in Groups 1 and 2 was on working with the text *The house on Mango street* and highlighting differences between vocabulary in British and American English. The pattern of changes in motivational intensity was similar in both cases in that the levels of involvement were the lowest at the beginning and end of the lesson, which indicates yet again that learners are anxious to focus on something new after initial revision and assessment, but, at the same time, they are likely to get tired and bored towards the end of the lesson. The most evident increase in motivational intensity in Group 1 took place when the students started discussing the text and the relevant vocabulary was explained to them (an increase of 0.5 from minute 10 to 15), while in Group 2 it was tied to a transition to a task based on independent work involving the use of the Internet to complete a table with British and American equivalents (an increase of 0.29 from minute 25 to 30).

As regards Lesson 4 in Group 3, it involved a series of activities concerning the link between a bad diet and the incidence of crime, and it was therefore devoted to the development of different language skills. Also in this case there was a marked increase in motivation intensity as the learners were requested to focus on the main theme of the lesson by reacting to a drawing depicting a number of people eating in a fast food place, as evidenced by a rise of 1.5 from minute 5 to minute 10, and although a dip of 0.5 could later be observed, the levels of interest and involvement remained high, oscillating around 5.00 as the participants were requested to complete a listening and a speaking task. What is interesting here is that there was a spike at the very end of the lesson as the teacher was wrapping it up, a change that does not lend itself to a straightforward interpretation with the help of the available data. As to Groups 1 and 2, the topics covered in Lesson 3 were reversed, with the effect that the former focused on differences between British and

Table 2 Means for the learners' evaluation of the four lessons in Groups 1, 2 and 3

| Group/lesson	Lesson 1	Lesson 2	Lesson 3	Lesson 4
G1	3.79	4.25	4.79	4.02
G2	4.40	4.32	5.47	4.23
G3	4.50	4.50	4.58	4.67

Fig. 6 Learners' evaluations of the four lessons
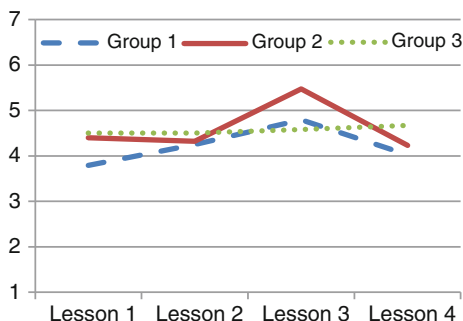
American English and the latter on the reading text. In Group 1, the most considerable changes in motivational intensity could be detected between minutes 5 and 10, as the learners began to delve into the differences between the two dialects (an increase of 0.42) as well as minutes 40 and 45 when the lesson was entering its final phase (a drop of 0.75). In Group 2, somewhat surprisingly, the students became much less interested when they were asked to actually work on the text, as evidenced by a drop in the self-ratings by 0.83 from minute 10 to minute 15, with their engagement staying at pretty much the same level after this point. Once again, such results could be interpreted as showing that the importance of the topic or task can in many situations be overridden by individual and contextual factors.

When it comes to the fluctuations in the magnitude of the intensity of motivation from one lesson to the next, they can be assessed on the basis of the learners' evaluations of the four lessons and the teacher's perceptions of the participants' interest and engagement. As can be seen from Table 2 and Fig. 6, the third-grade students were the least satisfied with Lessons 1 and 2, dealing with the qualities of an ideal boyfriend and writing an informal letter, but it has to be admitted that their evaluations of the two remaining classes were only marginally higher and the differences never reached statistical significance ($p > 0.05$). When it comes to Groups 1 and 2, the learners in the former proved to be the least involved in the class dealing with relative clauses and the most in the one devoted to reading a text, whereas those in Group 2 tended to be the least engaged in the lesson dealing with reading and discussing the text *The house on Mango street* and the most in the one focusing on the differences between British and American English, with the divergences between the most positive and negative evaluations being statistically significant ($p < 0.05$), outcomes which, yet again, speak to the importance of a host of different factors impinging on the intensity of learners'

Table 3 Means for the teacher's evaluation of the four lessons in Groups 1, 2 and 3

Group/lesson	Lesson 1	Lesson 2	Lesson 3	Lesson 4
G1	2.75	3.63	3.63	3.50
G2	4.13	3.50	4.88	3.38
G3	3.75	3.50	4.25	4.25

Fig. 7 Teachers' evaluations of the four lessons
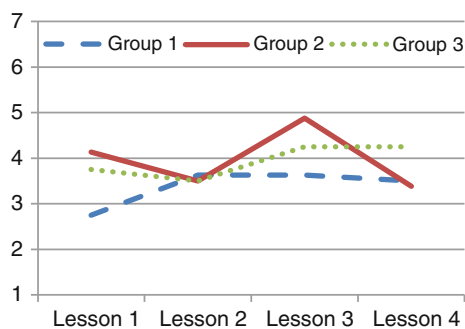
motivation. These perceptions were only partially mirrored in the responses provided to the teacher questionnaire (see Table 3 and Fig. 7), which, quite predictably, were on the whole less optimistic than those given by the students. To be more precise, as regards Group 3, the teacher also judged Lessons 1 and 2 to be the least engaging, the second one somewhat more so than the first (a difference of 0.25), but did not see any difference between Lessons 3 and 4 (a score of 4.25) in both cases. When it comes to the second graders, the rating was the lowest for Lesson 1 in Group 1 and Lesson 2 in Group 2, both of which were devoted to introducing relative classes, although it should be noted that the teacher regarded the students in the latter to be more engaged (an evaluation of 2.75 in Group 1 and 3.50 in Group 2). The highest scores were given to Lessons 2 and 3 in Group 1, focusing on texts about Dorian Grey and the house on Mango Street (3.63 in both cases), and Lesson 3 in Group 2 which dealt with the differences between British and American English (4.88). Also, in this case, the differences between the extreme evaluations reached statistical significance ($p < 0.05$).

Some insights into the factors accounting for temporal variation in the intensity of the participants' motivation also stem from the data gleaned from the interviews. One such factor was the nature of the activity that the learners were asked to perform, with some tasks being inherently more motivating than others, although the participants were far from being unanimous in this respect, with the preferences they expressed often being contradictory. It should also be added that those predilections were in many cases closely related to the level of difficulty that a particular activity posed, which again was subject to considerable individual variation. Some of the students also stated that their involvement depended on the overall nature of a particular class (e.g. doing activities from the coursebook vs. engaging in more creative tasks), the challenge that the tasks they were requested

to perform posed, the requirement for working with other students as well as the relevance of the activities performed for the final examination. The excerpts below illustrate some of these points:

- The lesson was interesting because we could practice our reading and speaking skills. (…) It was difficult for me to put together what I wanted to say.
- The most interesting was describing the picture and translating the words and the least the listening because I could hardly understand anything.
- I found the description of the picture interesting but not the questions that we had to ask because I did not know how to answer them.
- The first lesson was not very interesting because it mainly involved looking in the course book and reading a text. (…) then we listened to something else about this text. I wanted to after working after the first time but we listened again, I had to wait and became bored.
- Learning vocabulary is the most interesting and the least engaging is learning grammar because how many exercises can you do?
- The most motivating are tasks that are performed in pairs because we can help each other if one of us does not know something.
- The last activities were interesting because we started doing something we had never done before. There were things that we are going to need for the final exam, such as writing a letter or describing pictures.

5 Conclusions

As can be seen from the foregoing discussion, the study reported in the present chapter provided some evidence for the dynamic nature of language learning motivation, both with respect to the participants' motives for learning English and the magnitude of motivational intensity, particularly when it comes to fluctuations in this respect in the course of single lessons and sequences of such lessons. When it comes to the long-term perspective, the main impetus for change, typically for the better, was instrumentality, understood both in terms of pursuing pragmatic goals (i.e. a promotion regulatory focus) and avoiding adverse consequences (i.e. a prevention regulatory focus), although it should be emphasized that such modifications were acknowledged only by some of the participants. As regards short-term changes in interest and involvement, such as those transpiring from one lesson to the next as well as taking place on a moment-by-moment basis within the confines of a single class, they proved to be dependent on the overall focus of the lesson, the nature of the task performed, the duration of the activity, the transition from one part of the lesson to the next, the opportunity to cooperate with others, as well as relevance of what was being done to the final examinations. Given the fact that the motivational intensity manifested by different groups sometimes diverged for the same tasks and that individual learners also approached various activities with more or less enthusiasm, it is clear that many other variables contribute to determining motivational intensity both over time and at a particular point in time,

such as individual differences, specific contexts and situations, group dynamics, the rapport the teacher manages to establish with learners as well as an array of other, often unpredictable internal and external influences (e.g. a learner's disposition on a particular day, the conditions in which a lesson is conducted, the presence of distracting factors). This clearly demonstrates that, as postulated by dynamic systems theory, the study of motivation as a process should "recognize the crucial role of interaction of a multitude of variables at different levels (…)" (DeBot et al. 2007: 7). This complex set of influences defining an individual's motivation at a given time and place is crucial because it may predict if, and if so, how language learning affordances (Aronin and Singleton 2012b), i.e. possibilities offered by a particular lesson, themselves the result of an interplay of a multitude of factors, will be responded to and taken advantage of.

   Although the study has provided interesting insights into the dynamic nature of motivation, it is not immune from weaknesses which were addressed at length by Pawlak (2012), who used a similar design and employed identical data collection tools. Suffice it to say at this point that interviews administered to learners within the space of little over one week could not be expected to shed much light on the changes in the participants' motives or the magnitude of their motivation since the time they had started learning English. Although the script included a question that specifically addressed the occurrence of such changes, the interviewees may have found it difficult to carefully reflect on their learning histories at that particular time and therefore the information they provided could only be patchy and perfunctory. It is clear that tracing such fluctuations would require a longitudinal study, with interviews being conducted, say, once a month over the period of one school year, a condition that the present research project could not satisfy due to its main focus on more abrupt changes in motivational intensity from one class or task to the next. Even in this case, however, the data collection tools are not free from shortcomings, related among other things to the time scale used in the motivation grids (i.e. self-ratings provided every five minutes), the requirement to indicate the level of involvement at the very beginning and end of the lesson, the choice of adjectives employed to evaluate the lesson, or the fact that the participants may have been somewhat reluctant to express their real attitudes to the activities performed or to pass an objective judgment on the lessons taught. Finally, although based on the data yielded by the interviews and the analysis of the questionnaire with respect to the lesson plans, the discussion of the factors which could have induced fluctuations in motivational intensity was to some extent speculative in view of the fact that no data were available on individual differences (e.g. learning style, personality, learning strategies, aptitude etc.), group dynamics or the perceptions of the teachers. All of this goes to show that there is a pressing need for more research on the temporal nature of language learning motivation, such that would focus on other groups of students at different educational levels and rely on clusters of data collection tools that should be constantly refined and adjusted to contexts in which specific studies are undertaken. In the view of the present authors, such research is indispensable as it will help teachers better understand how learners' motivation evolves, both over longer periods of time, from one

lesson to the next and from one task to another, as well as the factors responsible for these changes, which is likely to translate into the application of motivational strategies tailored to the contingencies of a specific instructional context.

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Testing Linguistic Awareness Among Learners of Hungarian

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Abstract Hungarian is a non-Indo-European language, and like other Finno-Ugric languages is agglutinative, which means that word meanings are modified by adding different and multiple endings or suffixes to the words, rather than using prepositions. It differs greatly from Indo-European languages, and thus it is considered 'unlearnable' for most speakers of European languages. Hungarian is a language island in the middle of Europe surrounded by Germanic, Neo-Latin and Slavic languages. In spite of its uniqueness, it has survived many centuries, and even now the Hungarian language has 15 million speakers worldwide. It may play different roles in its speakers' lives: a first language, a heritage language, a language of the environment and a foreign language. In our study, we examine the language attitude of students of Hungarian with different linguistic backgrounds and we take into consideration their linguistic repertoire. The subjects of the study are citizens of other countries living temporarily in Hungary: Erasmus students, who have no Hungarian history in the family and learn Hungarian as a foreign language while staying in Hungary, and students of Balassi Institute with some Hungarian background in the family and who are learning Hungarian as a heritage language. By means of a questionnaire, a language decision task, a semantic rhyming and a phonological rhyming test, we study their attitude to the Hungarian language. We analyze the motivating factors for their stay in Hungary and their linguistic awareness. Our goal is to make Hungary more attractive for non-Hungarian speakers and motivate them in learning the Hungarian language and culture, and thus to contribute to the language maintenance activity.

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1 Introduction

Several factors have influenced the authors of this study to start their investigation of Hungarian language learners, their attitudes towards the language and their phonological and semantic awareness as speakers of other languages. First, we are involved in teaching Hungarian to Erasmus students coming from different linguistic backgrounds and experiencing various difficulties with the language. Secondly, an info-graphic appeared about Hungary on Facebook (9GAG) including facts about the culture, history, people and the Hungarian language. Since more than 700 various comments were added at the time of the writing of the present study, we thought the comments might be compared to what we gained as results from our study.

2 Background Issues

2.1 The Hungarian Language

Hungarian is a non-Indo-European language, and like other Finno-Ugric languages is agglutinative, which means word meanings are modified by adding different and multiple endings or suffixes to the words, rather than using prepositions. It differs greatly from Indo-European languages, and thus it is considered 'unlearnable' for most speakers of European languages. Hungarian is a language island in the middle of Europe surrounded by Germanic, Neo-Latin and Slavic languages. In spite of its uniqueness, it has survived many centuries, and even now the Hungarian language has 15 million speakers worldwide. It may play different roles in its speakers' lives: a first language, a heritage language, a language of the environment and a foreign language.

The modern Hungarian language is written using an expanded Latin alphabet, and has a phonemic orthography, which means the Hungarian alphabet contains 44 letters, where there is a one-to-one correspondence between phonemes and graphemes. Hungarian has 14 vowel phonemes and 25 consonant phonemes. Letters that are used in loan words 'w', 'q', 'x' and 'y' are not considered as parts of the Hungarian phonemic inventory; for phoneme [j] Hungarian has two letters to represent phoneme /j/: 'j' and 'ly', which only matters in orthography. In addition to the Latin alphabet, Hungarian uses several modified Latin characters to represent the additional vowel sounds of the language. It has seven pairs of corresponding short and long vowels: 'a–á', 'e–é', 'i–í', 'o–ó', 'ö–ő', 'u–ú', 'ü–ű'. Some of these pairs show only quantitative differences in pronunciation varying only in their duration. However, pairs 'a–á' and 'e–é' differ both qualitatively in closedness and quantitatively in length. Their phonetic values do not exactly match up with each other, so 'e' represents [ɛ] and 'é' represents [eː]; likewise, 'a' represents [ɒ] while 'á' represents [aː] (Hegedűs 2012).

The Hungarian writing system uses 9 diagraphs (consonant pairs read out as a single sound) and they should be treated as single graphemes, which always have the same corresponding phonemes during reading. Letters 'c', 's', and 'z' are used alone (ʦ, ʃ, z) or combined in diagraphs 'cs', 'sz', 'zs' (ʧ, s, ʒ), while 'y' is used only in diagraphs 'ty', 'gy', 'ly', 'ny' as a palatalization marker. Diagraphs used in Hungarian may contribute to reading problems in some cases. For instance, 'cs' is pronounced as 'ch' (as in 'much') and not 'c + s'. It may seem that the Hungarian orthography is not as simple as it is often described, but once the nearly one-to-one grapheme-phoneme correspondences are learned, even non-word reading becomes easy (Csépe 2006).

2.2 Hungarians in the World

2.2.1 Hungarians in the Neighboring Countries

Hungarian is spoken not only in Hungary, but large communities in the neighbouring countries also speak the language as their L1. After the Treaty of Trianon (Versailles) in 1920, Hungary lost 72% of its territory and 64% of its population. Although post-war Hungary became ethnically more homogeneous, many Hungarians (31% of ethnic Hungarians) live beyond the borders of Hungary in minority circumstances. In the Ukraine, Transcarpathia is the territory that used to belong to the Austro-Hungarian Monarchy, and though it is a multiethnic region, according to the 2001 Census, 156,600 people (12.7% of the regional population) speak Hungarian as their L1. In Romania, 1,237,746 Hungarians (6.5% of the total population) live in Transylvania (2011 census). In Serbia 290,207 (3.91% of the total population) Hungarians live in Vojvodina (2002 census). Slovakia has a Hungarian population of 520,528 people (8.5% of the total population) (2011 census). In Croatia there are 16,500 Hungarians (0.37% of the total population), in Slovenia in the Transmura region: 1,062, in Austria: 25,884 of these 10,686 in Vienna and 4,704 in Burgenland (2001 census). Although education in Hungarian is available from kindergarten to higher education in most of these countries, Hungarian does not have an official status in any of them (it is the regional language in Transcarpathia). Simultaneous processes of linguistic assimilation, language loss and language maintenance are going on in these Hungarian communities.

2.2.2 Hungarians in Other Parts of the World

Hungarian communities can also be found in other parts of Europe, like the UK, Ireland, Germany, etc. A significant proportion of Hungarians lives in the USA (the total number of Hungarians: 1,582,302, among them of Hungarian origin: 997,545 people), who immigrated in three large waves to the US: between 1848 and 1850 (the so-called Fourty-Eighters), during the last decades of the 19th

century and the beginning of the 20th century (people looking for a better life), and in 1956 (revolution in Hungary). The largest Hungarian communities live in Ohio, New York, California, Pennsylvania and New Jersey. Hungarians immigrated to Australia after World War II and in 1956. According to the 2006 census, the number of Hungarians who were born in Hungary is 20,160, which is a 11.4% decrease compared to the data in the 2001 census. Emigration to New Zealand from Hungary began in the middle of the 19th century. According to the last census data in 2006, around 2000 Hungarians live there.

In the past two decades, more and more ex-patriots living in different parts of the world have been sending their children to Hungary to improve or learn the heritage language and to become familiar with the Hungarian culture. Some of them use the Hungarian language at home in the family, others have little exposure to it as the parents use mixed languages at home, and there are quite a few of them who arrive in Hungary lacking any knowledge of Hungarian. Balassi Bálint Institute is the headquarters and home institute for those who want to familiarize themselves with the Hungarian language and the culture. Courtesy of this institute, we carried out our research among their students. The Hungarian language for these students is either a first, heritage or foreign language.

2.3 Testing Phonological and Semantic Awareness of Bilinguals

Phonological and semantic awareness can be tested in many different ways. Studies of bilingual phonological and semantic awareness seek the answer the question as to whether bilinguals process their languages selectively or non-selectively. Singleton (1999) claims that the phonological and morphological features of the language enhance a separated search in the lexicons, e.g. an English-Chinese bilingual when hearing or reading the word 'adeptness' will search only in the English lexicon as there is no 'ness' suffix in Chinese. According to Singleton, cognates create greater problems in word recognition. He refers to a study by Kirsner et al. (1993) and gives an example of the word 'table', which is stored by a French speaker of English as an English variant of the French word. However, this means that the word with the French pronunciation is stored as a French word, and is activated only when the person speaks in French. In this way, in the case of cognates, there is integration at the formal level, but as they get activated in the current linguistic context, they also demonstrate separate as opposed to integrated storage.

Language non-selective lexical access has been proved by a number of studies on bilingual word recognition. In psychophysical visual lexical decision tasks, the participants are required to decide (and push the 'yes' or 'no' button) whether the letter sequences presented on the computer screen are words or not. These studies contain real words and pseudo-words, i.e. letter strings that follow the orthography and/or the phonology of the target language, but they lack meaning. De Groot

(2011) criticizes this method as being unnatural, as rarely do people need to decide whether a sequence of letters is a word or not. In generalized lexical decision tasks the participants are asked to push 'yes' if the word exists in either of the bilingual's languages and 'no' if it does not have a meaning in either of the languages.

A number of studies involve interlingual homographs or homophones. These are words with the same orthography or phonology but having two different meanings in the bilingual's two languages. Some studies test such words in isolation, others in context. Response times to homographs are either longer or shorter than those of the control words in the available studies; this is due the homograph effect, which shows that both languages are activated while processing. When processing homographs, their phonological forms, which might be different in the two languages, are activated, and semantic activation is also triggered in both languages. Whether the reaction time is shorter or longer depends also on the frequency effect of the homograph. Another kind of lexical decision test for bilinguals is the language decision binary classification test when participants decide which language the given word belongs to (see Dijkstra et al. 1999, 2000a, b; Jared and Szucs 2002).

Several models simulate lexical access of bilinguals. Lévy and Grosjean developed BIMOLA (Bilingual Interactive Model of Lexical Access; see Lévy and Grosjean 2008), which is a model of spoken word recognition and represents the auditory features, phonemes and spoken forms of words in three layers of nodes that can activate or inhibit the neighboring nodes. BIA (Bilingual Interactive Activation; see Van Heuven et al. 1998) represents activation in visual word recognition at four levels: visual letter features, letters, orthographic forms of whole words and language information. Features and letters are shared in this model and word nodes are organized in language subsets. When an interlexical homograph is presented, both language subsets are highly activated while words existing only in one of the languages of the bilingual activate only that specific language. This might be the reason for the faster and longer responses in case of homographs.

SOPHIA (Van Heuven and Dijkstra 2001) is another model of bilingual activation that considers phonological and semantic representations as well. It has been proved that during visual word recognition phonological memory nodes are also activated. Regardless of the orthography (alphabetic or logographic), the reader automatically activates the auditory form of the word (Kaushanskaya and Marian 2009). Haist et al. (2001) in an fMRI study of primary auditory cortex activation during visual word recognition found that a region in the left-hemisphere primary auditory cortex that is involved in the most basic aspects of auditory processing is engaged in reading even when there is no environmental oral or auditory component. When processing a visual word input, the corresponding orthographic representations of both languages are activated first. This activation is transmitted to the phonological nodes with which they are connected and to the language and semantics nodes. During this series of activations, lexical items compete until the selection is complete and the input word is recognized. In addition, the simultaneous activation of the two languages concerns not only interlexical homographs but also the words' orthographical or phonological neighbours, albeit not under all circumstances (Jared and Kroll 2001). As a result of further studies (Haigh and

Jared 2007; Van Leerdam et al. 2009), de Groot concludes that in visual recognition of L2 words, the words' phonological activation goes on in the same way as in native speakers. This happens automatically, unconsciously and activation under certain circumstances is parallel in both languages.

This leads us to the assumption that lexical access is language-nonselective, at least in the recognition of isolated words. Before the ultimate recognition of the input word the language nodes come into play and act as language filters. An activated word transmits activation to the corresponding language node and deactivates as much as possible the other language node. Due to this inhibition, if input words are presented mixed from the two languages, the level of activation in the word node is relatively low and it slows down recognition. On the other hand, if input words are presented from the same language, the non-target language is less activated and this secures language control. In such cases, word recognition is faster and the accuracy rate is higher. In an earlier study, Caramazza and Brones (1979) found no time-related differences in a bilingual semantic categorization task, where participants had to decide whether the word pairs were semantically related or not. It took equally long when a word belonged to the same language or to different languages.

In what follows, we will present the results of three visual word recognition tests performed with psychophysical techniques. A phonological rhyming test involves real words in Hungarian and English that are phonologically similar or different, another is a semantic rhyming test, while the third aims at mixed lexical decision and language decision with the involvement of real Hungarian and English words, interlexical homographs and pseudo-words in both languages. The tests are carried out on three groups of subjects, who are categorized according to the role of Hungarian in their linguistic repertoire. For Group 1, Hungarian is a heritage language, for Group 2—a foreign language, and for Group 3 Hungarian is L1 and its members use English as a second language on a daily basis.

3 Methodology

3.1 Participants

The participants were classified into three groups. The first group consisted of 16 students with Hungarian as a heritage language; their age ranges from 18 to 32 (M = 22.77, SD = 3.49). They are all early bilinguals having an encounter with the Hungarian language in the family in natural circumstances in their childhood. The subjects of this group are studying in the Balassi Institute, Budapest.[1]

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[1] More than a hundred young foreigners arrive each year to the programs offered by the Balassi Institute of Budapest. The Institute is mainly chosen by people who wish to gain a more thorough knowledge of the Hungarian language, culture, literature and history (http://www.bbi.hu/hu/).

The languages used by them are as follows: Hungarian, English, French, German, Portuguese, Spanish, Italian and Arabic. The second group consisted of 17 students, who study Hungarian as a foreign language in Hungary; their age ranges from 19 to 31 (M = 23.47, SD = 3.02). They are either students at the Balassi Institute in Budapest or Erasmus students at the University of Pannonia in Veszprém. They are bi- or multilinguals; besides Hungarian they listed the following languages: English, French, Spanish, Portuguese, Turkish, Italian and Yoruba. English major students (N = 17) from the University of Pannonia (Veszprém) comprise the third group, whose L1 is Hungarian (age range: 20–30, M = 23.52, SD = 3.16). Other languages spoken by them are: Spanish, German and French.

3.2 Material

3.2.1 Questionnaire

In order to reveal the subjects' linguistic background and attitude towards the Hungarian language, an online questionnaire was designed. Subjects had their own IDs to be identified in the different tests. The questionnaire consisted of two parts. The first part asked for personal information such as age, gender, linguistic configuration and language use. The second part of the questionnaire contained 13 questions about Hungary, Hungarians and the Hungarian language. This part consisted of a set of open-ended questions that elicited information from students about the length of their stay in Hungary, and whether they would recommend Hungary to their friends. The data thus gathered allowed us to draw a series of conclusions with regard to attitudes towards the Hungarian language and the amount of use of Hungarian in the community and at home.

3.2.2 Phonological Rhyming Test

A phonological rhyming test consisting of 40 English and Hungarian mixed pairs of words and 40 same language controls (20 English pairs and 20 Hungarian pairs) was prepared for the participants. Half of the test pairs and half of the controls rhymed. 8 of the tested rhyming pairs were homophones ('scene–szín', 'sigh–száj') that have the same phonology but different meaning in the two languages and 12 were neighbors ('shoes–húz', 'shut–csat') that differ in only one feature in their phonological components and have different meanings in the two languages.

3.2.3 Semantic Rhyming Test

The semantic rhyming test contained 40 English and Hungarian mixed pairs of words and 40 same language (20 English and 20 Hungarian) pairs. The pairs

rhymed if the semantic relation between them was coordinate (hyponyms, e.g. 'kígyó [snake]–snail', 'toll [pen]–pencil') or subordinate (hyperonyms, e.g. 'rózsa [rose]–flower', 'kutya [dog]–pet'). Non-rhyming pairs had no semantic relation between the words, e.g. 'orr [nose]–coat'.

3.2.4 Language Decision Test

In the language decision test, there were 60 Hungarian (e.g. 'sarok' [corner], 'kabát' [coat], 'kocsi' [coach]*)* and 60 English real words (e.g. 'table', 'lamp', 'mushroom'), 60 homographs that have the same orthographies in the two languages (Hungarian meanings are given in brackets): e.g. 'tag' [member], 'mind' [all], 'hat' [influence; six]. From the 60 homographs, there were 21 cognates that shared not only the orthographic layout of the words but also the meaning of the words (e.g. 'film', 'filter', 'platform'). Finally, 60 pseudo-words were also applied, 30 of which were letter strings following the Hungarian and 30 the English phonotactic rules (e.g. Hungarian: 'akala', 'ilibe', 'lobiga'; English: 'prenger', 'fleness', 'carabond').

3.3 Procedure

A custom made program (MATLAB, MatLab Inc.) running on a PC was used for the experiments. Word pairs were presented on a white background, using black characters (Arial, font size 14) in the middle of the screen. The viewing distance was set to be the appropriate normal viewing distance of a computer screen (∼50 cm). The participants received written instructions at the beginning of the experimental session. This ensured that every subject received the same instruction. In the phonological test, the task was to decide whether the words just seen were phonologically rhyming or not. In the semantic test, the task was to decide whether the words just seen semantically rhymed, i.e. linked semantically or not. In the language decision test, participants had to make decisions whether the words appearing on the screen were English or Hungarian.

Trials started with the onset of a fixation spot in the middle of the screen, which was followed by a word pair chosen from the pool. The inter-trial interval was set for 2 s, the word pairs stayed on the screen for 5 s (exposure time). During this time participants were required to hit the right arrow key if they considered the word pair on the screen to be rhyming in the rhyming tests and English in the language decision test, and the left arrow key if they were not rhyming or were Hungarian. If no response key was selected during the exposure time, the program did not record anything and the next trial started (fixation onset for 2 s, etc.). The task was machine paced to ensure a constant level of attention of the participants.

Participants were shown 5 pairs initially to become familiar with the procedure (training phase). After a short break, the 80 word pairs of the phonological rhyming test, then the 80 word pairs of the semantic rhyming test and finally the 240 words of the language decision test were presented in a semi-random fashion (test phase). The program recorded correct/incorrect hits and response latency times. Data were analyzed with the Statistica software (StatSoft, Inc.) using nonparametric statistical methods (Sign test) and *Chi* square test. The results were classified as significant if the corresponding type error was smaller than 0.05.

4 Results

4.1 Attitudes Towards the Hungarian Language

As a first step we analyse comments gained from the Facebook info-graphics. All the head comments and sub-comments were collected in an Excel file including the nationality of the commenters (if it was available). Comments were then classified into subgroups depending on the topic of the comment and it gave us an opportunity to conduct a qualitative analysis of the opinions of foreigners about Hungary and Hungarians (Hungarian commenters are not included in the analysis). The sample, taken from 9GAG (http://9gag.com/gag/6832266), is not representative, and the quotes were not altered; no spelling or grammatical mistakes were corrected. Here we present some of the topics discussed that were commented either positively or negatively (obviously, topics of the comments are influenced by the topics of the info-graphics):

- Jokes:

  I'm not hungry, thank you! (Bulgarian)
  This post made me hungary. (Spanish)
  Hungary? Well, I am pretty hungary right now, and could really use a sandwich… (Argentine)

- Language:

  Hungarian and finnish are the only two national languages in europe who aren't part of the Hindu- European language family, but are part of the Uralic language family. (Finnish)
  Actually letter ü is also in estonian language. Maybe we spell it differently but it sure looks the same. (Turkish)

- Positive feelings. Even though there are many negative and critical comments under the post, we can find positive ones expressing their positive experience in Hungary and with Hungarians. Some of them are written by Poles, who are keen on Hungarians based on our history, some of them concern beautiful women, nice food and people:

Polak, Węgier, dwa bratanki, I do szabli, I do szklanki! Lengyel, Magyar—*két jó barát, együtt harcol, s issza borát!* (Polish) (Polish, Hungarian, two good friends, they fight together and drink their wine together—a well-known slogan of Polish-Hungarian friendship)

The Hungarian, from my own experience, they have really great sense of humor. (Chinese)
I did better… I married one… she's half polish! (Swedish)
But seriously: Ernő Rubik (Rubik's cube), Ferenc Puskás (1954 FIFA World Cup finalist), Sziget Festival (lasts a week), Pálinka (blackout provider for the previous event… egészségedre), baths and spas of Budapest… (French)
We were neighbours, yet until today I knew literally nothing about your country. Hugs from Ukraine. Sorry about Chernobyl. (Ukrainian)

Given the above examples, we were really interested in the attitude and the opinion of our subjects about Hungary and the language. We hypothesised that meeting the language, the people and the culture triggered positive feelings. Respondents with Hungarian as a heritage language came to Hungary to find their roots, to improve their command of Hungarian and to learn more about the culture. It is worth mentioning that the heritage language group's responses to the open-ended questions showed a consensus of opinion with respect to the importance of the Hungarian language and culture. They claim to have come to Hungary:

To perfect my hungarian language, to deepen my hungarian identity and sense of national pride, to experience the culture, history, people, first hand, to visit relatives. (female, 18)
Good question. I felt a calling mostly. It wasnt a rational decision since I left a job, boyfriend and my mom to be here. I felt like it was important to learn my heritage and language while getting experience traveling and meeting all kinds of people and… (female, 21)

Students learning Hungarian as a foreign language came to the country because they were interested in the culture and the language and because of low prices:

To further my education in a more affordation place with quality education (male, 31)
Because I wanted to see hungary I wanted to learn hungarian culture. (male, 23)

One of the questions concerned what interests students in Hungary. Among the answers they listed language, culture, food, history, landscapes. Subjects were also asked what they thought and how they felt about the Hungarian language. Answers were all on the positive side, though they consider the language difficult and challenging.

well if i could speak a bit better i would also enjoy it better, but i belive it's worthwhile to discover it. (female, 24)
I have trouble with some of the spelling; deciding wether to write certain words in one or separately. The Hungarian language is very beautiful and descriptive. There are many many more words in Hungarian to describe certain things, than in English. (female 18)
Its hard, but very fun to speak once you speak some. The grammar is like nothing Ive seen before, which makes it difficult to learn. (male, 19)
Of course it's some difficult for me because I'm leraning hungarian language first time. (male, 23)

4.2 Linguistic Awareness of the Learners of Hungarian

4.2.1 Language Decision Test

When the respondents were expected to decide which language the word appearing on the screen belongs to, the fastest and best results were gained from those learning Hungarian as a heritage language. As for the decisions about Hungarian real words, there was no temporal difference between the three groups (0.79 s), but the foreign language group performed less successfully than the other two groups (87% as opposed to 94% in the L1 and heritage groups), though the difference is not significant. Decisions about interlingual homographs required longer reaction times, as is mentioned in other studies. When respondents decided that the words belonged to the English language (0.86 s), it took them a shorter time than when they thought they were Hungarian words (0.95–1.0 s). In all the three groups, from among the homographs, more words were thought to be English, though to a different extent. The most balanced results came from the L1 group, where 56% of the homographs was recognized as English words. In the other two groups, there were significant differences: in the foreign language group 69% and in the heritage language group 70% of homographs were thought to be English while only 25 and 28% to be Hungarian.

The slowest reaction times were measured in the decisions about pseudo-words. As opposed to the homographs, in this task there were considerably more hits to the Hungarian button, which means respondents tended to decide rather on the semantics than on the phonological or orthographic features of the words. If a word was unknown to them, in the foreign language group 73% and in the heritage group 61% of the decisions were for Hungarian. In the L1 group, the difference is not significant between the English and Hungarian decisions (46 vs. 49%). However, in the foreign language group only 22% and in the heritage group 33% of the decisions were for English words. This means that pseudo-words that match both the English and Hungarian orthographic and phonological rules but had no meanings were thought to be Hungarian. As a result, the orthographic awareness of students of Hungarian has been demonstrated.

4.2.2 Phonological Rhyming Test

In the phonological rhyming test, the test word pairs were mixed and the control word pairs were from the same languages (either English or Hungarian). Rhyming test word pairs were always recognized faster than the non-rhyming ones. In the L1 group the difference between the reaction times of the decisions was significant: 1.6 versus 1.9 s ($Z = 3.10$); in the foreign language group the difference was also significant: 2.07 versus 2.48 s ($Z = 2.86$); however, there was no significant difference in the heritage group: 1.93 versus 2.00 s. As for performance, in the L1 group control word pairs, i.e. words from the same languages, were recognized

with a slightly greater accuracy (82%) than mixed test words (81%), but the difference is not significant. In the other two groups, test word pairs had seemingly better results (56 and 71%) than control word pairs (49 and 65%), but the statistical analyses did not show any difference. However, in the non-rhyming category, in the foreign language group, control words were statistically more successfully identified (65 and 76%) than test word pairs (42 and 62%) (Z = 2.81). The heritage group always outperformed the foreign language group, but there was no difference between their data.

4.2.3 Semantic Rhyming Test

In the semantic rhyming test, just as in the phonological test, the test word pairs were mixed and the control word pairs were from the same languages (either English or Hungarian). Participants made decisions on whether the word pairs were semantically related or unrelated. In this task, orthographic and/or phonological awareness is not sufficient; respondents could make correct decisions only if they knew the words in both languages. The shortest time was measured and the best performance was recorded in the L1 group, and there was no difference between test words and control words data. In the rhyming pairs the average reaction time was 1.43 and 1.42 s, in the non-rhyming ones: 1.67 and 1.66 s. No significant difference was recorded in the foreign language group, but there was a difference (Z = 2.22) in the heritage group's rhyming control and test word pairs' reaction times. The controls were shorter (1.47 s) than the test word pairs (1.62 s). In the case of non-rhyming word pairs, no difference was observed in either the foreign language or the heritage language group. Although the best accuracy rate was achieved in the L1 group, and the performance of control word pairs was better (rhyming: 88%, non-rhyming: 90%) than that of the test word pairs (rhyming: 84%, non-rhyming: 85%), these differences were statistically not significant. The same was observed in the foreign language group even though the poorest results were obtained here. The accuracy rate of control words in the rhyming category was better than that of the test words (59 vs. 55%) and the same was obtained in the non-rhyming category: 65% control vs. 61.5% test results. Better results were gained in the heritage group, and, unlike in the other two groups, in this group decisions about the test words were more, though not significantly more, accurate (rhyming: 78%, non-rhyming: 75%) than about the control words (73 and 72%).

Table 1 shows the RT and Table 2 the performance results of all the three tests in all three groups (the following abbreviations are used: E = English, H = Hungarian, IH = interlexical homograph, T = test, C = control). When we compare the three groups, we see the differences between them, and they are indicated with bold figures. Temporal differences can be seen between the L1 and the foreign language groups in the lexical decision test in the decisions about English words (p = 0.016), in the phonological rhyming test in decisions about test word pairs

Table 1 Mean reaction time results of the three groups in the three tests

Group	Language decision			Phonological rhyming		Semantic rhyming	
	E/H	IH	Lexical decision	Rhyming	Non-rhyming	Rhyming	Non-rhyming
		E/H	E/H	T/C	T/C	T/C	T/C
Hungarian as L1	0.79/0.79	0.89/0.95	**0.90**/0.94	**1.60**/1.66	1.87/1.78	1.43/**1.42**	1.67/1.66
Hungarian as a foreign language	0.84/0.79	0.87/1.04	**1.16**/0.91	**2.07**/2.05	2.38/2.21	1.91/**1.84**	2.04/2.11
Hungarian as a heritage language	0.82/0.79	0.86/0.96	1.08/0.88	1.93/1.67	2.00/1.85	1.62/**1.47**	1.83/1.86

Table 2 Mean performance results of the three groups in the three tests

Group	Language decision			Phonological rhyming		Semantic rhyming	
	E/H	IH E/H	Lexical decision E/H	Rhyming T/C	Non-rhyming T/C	Rhyming T/C	Non-rhyming T/C
L1	89/94	56/**40**	**49/45**	**81/82**	**68/90**	**84/88**	**85/90**
Hungarian as a foreign language	88/87	69/**25**	**22/73**	**56/49**	**42/65**	**55/59**	**61/65**
Hungarian as a heritage language	93/94	70/28	33/61	**71**/65	62/**76**	**78**/73	75/72

($p = 0.0209$), and in the three groups in the semantic rhyming test in the reaction times of control word pairs ($p = 0.047$).

When we compare the performance of the three groups, we see significant differences between L1 and the foreign language groups in all tests with the exception of the language decision one and the interlexical homographs thought to be English. The differences in the decisions about homographs (considered to be Hungarian, $p = 0.012$), in the lexical decisions in the English data ($p = 0.0002$) and the Hungarian data ($p = 0.0000$) are apparent between these two groups. However, we see significant differences between all the three groups in the phonological and semantic rhyming tests as well: in the phonological test word pairs ($p = 0.004$), in the control word pairs ($p = 0.0000$), in the non-rhyming test word pairs ($p = 0.003$), in the control pairs ($p = 0.0001$), in the semantic test word pairs ($p = 0.0002$), and in the non-rhyming control word pairs ($p = 0.0001$). The performance of the heritage group did not differ significantly as compared to the other two groups in the decisions about semantic rhyming control and semantic non-rhyming test words, whereas the other two groups did perform significantly differently even in these decisions: control rhyming decisions ($p = 0.0001$) and test non-rhyming decisions ($p = 0.014$).

5 Discussion

Phonological involvement in reading has been proved by some monolingual studies (Baron and Strawson 1976) showing that regular letter-to-phoneme mappings (e.g. 'hint') are read faster than irregular letter-to-phoneme mappings (e.g. 'pint'). Studies with bilingual subjects found that in visual word recognition the word activated the non-target language too (Dijkstra et al. 1999), a result which was further supported by the cross-linguistic Stroop task where cross-linguistic interference was driven by the non-target language phonology (Chen and Ho 1986; Tzelgov et al. 1990). In our study, we had bilingual subjects whose language competence in the two languages varied.

Most members of Group 1 (the 'heritage group') can be called early bilinguals as 12 of the 17 participants had used both their languages from early childhood. Hungarian was the language of the home in non-Hungarian environments in 5 families, and four more subjects claimed that their language use at home was mixed. Four of late bilinguals learnt Hungarian, their heritage language, at school in Hungary. Now they are living in Hungary. Group 2 (the 'foreign language group') consists of people born to be monolingual with different linguistic backgrounds (English, Italian, Polish, Portuguese, Spanish and Turkish) and having command of at least one more Indo-European language, which was learnt at school. They are learning Hungarian at Balassi Institute and the University of Pannonia. Their acquisition of Hungarian is quite intense as they learn Hungarian at school, and it is also the language of the immediate environment for them. They are strongly motivated in learning Hungarian as most of them want to stay in Hungary for a while. In Group 3 (the 'L1 group'), next to Hungarian as L1, subjects were originally monolingual; now they have an intermediate or advanced level command of English. Only one person acquired English in a natural way, all the others learnt the language at school, 10 of them before age 9.

No temporal differences were observed in the language decision. The identification of real Hungarian words took equally long in all three groups with identical performance results in the L1 and heritage groups. The performance is worse in Group 2 as compared to the other two groups, but is almost identical with the accuracy rate of English word recognition in this group. For most people, both English and Hungarian are foreign languages. The result is similar to the performance of English words in the L1 group, where English is also a foreign language. A homograph effect was observed in all three groups with shorter reaction time results in both languages. The most balanced decisions in the judgment of inter-lexical homographs came from the L1 group. The other two groups had many more decisions on English rather than on Hungarian words. This might be explained by the frequency of word usage. Since Hungarian is the less used language for the heritage and the foreign language groups, it is natural that the more often used language will be activated when the test word is a homograph. The longest reaction time results were gained in the lexical decision test when in addition to the orthographic, phonological activation, the search for a meaningful

lexical item in either or both lexicons starts. Interestingly, the decisions were just the other way round than in the case of homographs. Meaningless letter strings evoked the Hungarian language node rather than the English one. Letter strings that resembled and suited both English and Hungarian phonotactic rules were considered Hungarian because of the lack of knowledge of the meaning.

Phonological awareness was tested with a rhyming test that consisted of mixed test word pairs and control same language word pairs. In general, we found that there are no temporal differences between the decisions about test and control word pairs. However, there were significant differences between the reaction times of rhyming and non-rhyming word pairs in all the three groups. In the non-rhyming word pairs it took longer to make decisions about the control words, but the decisions were more accurate, than about the test ones, whose performance was better at the rhyming pairs. Decisions about test (mixed) words were more successful in the rhyming pairs, whereas control words, i.e. word pairs from the same language, were always more successful in the non-rhyming pairs. The L1 group seemed to have worked best in the semantic rhyming test as well: they produced the shortest average reaction time and best performance both in the rhyming and non-rhyming pairs. As was expected, the heritage group outperformed the foreign language group simply because here meaning is crucial, and if the words are unknown, as could be presumed in the foreign language group, performance might be hindered.

Phonological awareness has received little attention though it has a crucial role in early literacy acquisition. Some research (Rubin and Turner 1989; Yelland et al. 1993; Bruck and Genesee 1995; Campbell and Sais 1995) with children who were only beginning to become bilingual suggests that advantage in phonological awareness disappears in first grade (with the beginning of literacy). Bialystok et al. (2003) studied the effect of bilingualism on phonological awareness of bilingual and monolingual children between kindergarten and Grade 2. They wanted to find out whether bilingual children develop phonological awareness more easily than monolinguals. They conducted three studies with children who were fully competent in both their languages. Their results show no evidence for the effect of bilingualism; however, they found that children who speak a second language with similar phonological structure and alphabetic orthographic system (e.g. Spanish and English) might have some advantage when learning to read in English.

In our study, in the comparison of the three groups' performance, in the phonological and semantic rhyming test results, no advantage of bilinguals could be observed. Bilinguals produced significant differences in the decisions from those whose first language was Hungarian and started English at school, at age 9 or later. However, the best results were always achieved by the L1 group. Still, heritage language comes second in the rank of the results, outperforming those for whom Hungarian is a foreign language. The phonological rhyming test produced the greatest differences between the groups, which means that phonological awareness is crucial in visual word recognition. Although orthographic awareness helps with the language decision test, the lack or shortage of phonological awareness might hinder word recognition if the word's letter structure and architecture match those

of both languages. Phonological awareness might be more problematic when one language has a shallow (transparent) and the other a deep (opaque) orthography, and they are tested at a time. Readers with little experience in the two languages might mix up the correct recognition of the phonological shape of the word. Phonological structure may overwrite the semantic content, and readers might ignore the fact that the visual input is meaningless; they might make incorrect judgments based on the surface of the input.

6 Conclusions

Hungarian, with its linguistic uniqueness in the middle of Indo-European languages, attracts language learners with different motivations. Some learn it because they have a history of the language in the family, and because parents and grandparents, or even the youngest generation themselves, think it is crucial to maintain the heritage language. Others think it is interesting with its linguistic uniqueness, and they consider it a challenge to become familiar with a non-Indo-European language that horrifies most people. Hungarians themselves being speakers of this unique language think they need to speak foreign languages because they think the uniqueness of their language keeps others away from learning it. However, since English is becoming a lingua franca all over the world, Hungarians concentrate mainly on English, and are trying to master it as much as possible.

The participants of our study think—unlike those posting comments to the infographic on the Internet—that the language is interesting and nice, though they find it really difficult. People on the Internet posted cultural stereotypes (both positive and negative), but they do not wish to learn the Hungarian language or to get acquainted with the Hungarian culture. Our subjects did not have any prejudice against Hungarian culture or the language; they were open to them. Having stayed in Hungary for a while, they quite liked both the language and the culture. In this way, they are motivated in learning Hungarian partly because it belongs to their heritage and partly because they want to master the language and participate in higher education in Hungary. The two groups who study Hungarian as a foreign language or as a heritage language in Hungary differ from each other, and this makes us assume that the difficulties emerge at different levels for them.

The main conclusions of our study are that there is hardly any temporal difference in performing visual word recognition. Orthographic awareness develops at quite an early phase of language learning, which helps with decisions about the languages. However, if the phonological features do not separate words at the orthographic level, i.e. letter strings may suit the phonotactic rules of both languages, semantics could be the next help in deciding which language node to activate. With phonological similarity, both language nodes are activated, and in the case of an unknown word, most people might decide incorrectly on their weaker language thinking that the word must be a real word in the language, just

unknown to them. This is what happened in all the three groups in the case of lexical decision tests when participants did not hesitate when it came to the classification of pseudo-words into the English or the Hungarian category.

As the greatest and most varied differences were observed in the phonological rhyming test, it became obvious that phonology is rather difficult for the language learner, and since the best results were obtained from the material of the Hungarian as L1 group, whose method of English language acquisition is instructional, i.e. they have always learnt English as a school subject in addition to extra-curricular activities in the language, this implies that school instruction may evoke a better phonological awareness than natural acquisition. Even those who acquired and used the language in the family but ignored the phonological rules produced significantly poorer results in the phonological rhyming test when compared to those who studied English as a school subject. Our final conclusion is that developing phonological awareness of language learners may trigger a higher quality language proficiency and a greater motivation in learning the language.

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Dyslexia in the European EFL Teacher Training Context

Joanna Nijakowska

Abstract Dyslexia is a specific learning difficulty that has an effect not only on literacy skills in students' first language, but also on foreign language learning (Sparks et al. 1989, 2006; Peer and Reid 2000; Schneider and Crombie 2003; Nijakowska 2008, 2010; Kormos and Smith 2012). In order to ensure that dyslexic students successfully acquire necessary levels of foreign language competence, they need adequate instruction and teachers' support. However, frequently enough, EFL (English as a foreign language) teachers lack sufficient understanding of the nature of dyslexia and the difficulties it causes in foreign language learning. They are not familiar with the relevant teaching techniques and methods to further the language learning processes of students with dyslexia. It seems that more often than not it results from the lack of satisfactory training on dyslexia/learning differences during the course of studies as well as from the limited offer of courses for in-service teachers which would enable them to get qualifications (knowledge and skills) to teach foreign languages to dyslexic students with success. The chapter reviews the outcomes of a study whose aim was to identify the professional development needs of EFL teachers with regard to teaching dyslexic language learners. Data has been collected with the use of an online survey. The study has been conducted among the pre- and in-service EFL teachers mainly from six European countries where institutions participating in the DysTEFL project www.dystefl.eu are located. The findings of the present study indicate that the respondents perceived their knowledge and skills with regard to teaching dyslexic language learners as rather poor. They acknowledged the existence of the apparent gap in their training concerning this issue and expressed a well-defined need and interest in further professional development in this respect. In addition, they voiced their opinion and preferences as to the format, content matter as well as types of tasks and activities they would find most favourable in the training materials/course on the EFL and dyslexia. Thus, the immediate implications of the study

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refer to both the structure and content of the training materials/course for EFL teachers to be developed by the DysTEFL project consortium in response to the needs teachers articulated in the survey. More broadly, the findings seem relevant and informative for the higher education authorities and teacher training institutions responsible for designing professional training schemes for EFL pre- and in-service teachers.

1 Introduction

1.1 Accommodating Learners with Dyslexia

Foreign language teachers are obliged by the formal ministerial regulations both to recognise the needs of dyslexic foreign language learners and to cater for them (Bogdanowicz and Sayles 2004); however, this obligation seems to be rarely met within the classroom.

Theoretically, it appears that foreign language teachers' choices can be well informed by available knowledge and research findings, providing evidence that either supports or fails to support the effectiveness of specific educational approaches and instructional practices that teachers can employ when working with dyslexic individuals. However, an apparent lack of enthusiasm and relative reluctance of teachers with regard to implementing research-validated educational activities can be observed (Ritchey and Goeke 2006; Philips et al. 2008). One of the reasons for the mismatch might be that teachers lack awareness as well as specialized thorough knowledge and understanding of the concepts that are to be converted from research and applied in practice (Phillips et al. 2008; Binks-Cantrell et al. 2012; Spear-Swerling and Cheesman 2012). This content knowledge is necessary in order to successfully teach struggling readers (Moats 1994, 2009; Bos et al. 2001; Moats and Foorman 2003; Washburn et al. 2011a, b), also in an EFL context (Goldfus 2012). Teacher knowledge studies (e.g. Joshi et al. 2009a, b; Goldfus 2012) revealed that a likely and plausible cause of limited knowledge of basic language concepts such as phonological awareness, phonemic awareness, alphabetic principle/phonics and morphology can be attributed to insufficient and/or inadequate initial teacher training. According to Washburn et al. (2011a, b), teacher knowledge of dyslexia (on which pre- and in-service teachers receive very little training) cannot be separated from the knowledge of these basic language concepts. However, the above-mentioned and other (e.g. Brady et al. 2009; Podhajski et al. 2009) teacher knowledge studies also indicated the potential of professional training in upgrading teacher knowledge, which then translates into applying appropriate instructional practices, choices and behaviors resulting in enhanced student achievement.

The observed lack of appropriate provision for dyslexic foreign language learners stems to a considerable extent from the fact that EFL teachers do not get adequate training in assisting such learners as a part of their initial and in-service professional development. In addition, when searching for information on their own, teachers can get truly confused with the massive amount of conflicting research outcomes, competing theories and alternative treatments offered in the study of dyslexia. Bearing this in mind, teachers' hesitation and doubts as to how exactly they should approach foreign language learners with learning differences/dyslexia can be legitimate. In light of the above, a demand for advice and training becomes evident. EFL teachers themselves repeatedly report the need for a comprehensible guidance on how to work with these learners. In addition, there exists great social demand and pressure on teachers to be able to understand the learning needs of learners with dyslexia and to accommodate them.

Even though one could rightly expect that issues referring to dealing with students with learning differences/dyslexia should constitute an integral part of pre- and in-service foreign language teacher training, the availability of appropriate training with regard to dyslexia offered to student teachers and practicing foreign language teachers across European countries seems to be extremely limited. Apparently enough, notwithstanding its salience, the process of translating the educational research findings into teacher practices or, in other words, recognizing and making research-based and verified techniques available to teachers seems considerably complex (Hurry et al. 2005). It consists of several levels and steps, including proper recognition of the issue in question and changes in a national policy, which in turn should prompt tailoring the design of both foreign language teacher training schemes and school curricula so that the needs of dyslexic foreign language learners are catered for. Only then can one expect a substantial change at the level of the classroom.

Thus the fundamental issue seems to be raising awareness of dyslexia among all parties involved in the creation and functioning of the educational environment. It appears particularly important in view of the multiple formal regulations, introduced in many countries, concerning the conditions and ways of assessing, classifying, promoting, and conducting exams for students with special educational needs (Bogdanowicz and Sayles 2004). These students can benefit from the type of schooling available to the majority of children, usually through a set of special educational arrangements, which adapt the system towards their needs and abilities—it is referred to as inclusion education or mainstreaming. The prevailing positive attitude of the educational stakeholders towards inclusive education for learners with dyslexia needs to be translated into significant changes implemented into the existing educational systems if these children are to be included.

Principally, inclusion policy involves rearrangements at the level of school management and those introduced by the individual teachers in order to address the special needs of children with dyslexia. The legal status of the special rights—defined as specific enabling solutions and arrangements—offered to children with dyslexia varies considerably across countries, schools and teachers. Thus, the availability of particular accommodations, influencing the actual everyday school

life of children with dyslexia, may be regulated by a national policy, school policy or can be entirely at a teacher's discretion. Indeed, this last option seems to be the case in the majority of instances.

The above-mentioned special rights may cover the areas of assessment, alternative ways of performing at school, special conditions during examinations and foreign language study (Bogdanowicz and Sayles 2004). Special arrangements would involve, for example, the appropriate pace of work, individual learning/education plans, special teaching techniques and activities, most preferably conducted by well-qualified teachers. However, an obvious prerequisite for making the educational opportunities equal for all children and for introducing successful accommodations for learners with dyslexia is teacher knowledge gained in the course of appropriate training. Teachers' awareness and alertness can trigger early identification of learning difficulties, most desirably followed by a wide offer of supporting activities and services, matched to the severity of difficulties. However, the reality is that even though teachers are obliged by the legal regulations to adjust their educational practices, requirements as well as conditions and forms of external exams so that they suit the individual needs and abilities of students with dyslexia, considerably frequently they are not sufficiently prepared and trained to fulfil this task. This basically means that variable practical solutions (more intuitive rather than based on sound knowledge and supported by research findings), significantly differing across schools and teachers, are offered to EFL dyslexic learners. Apparently, one of the possible reasons for this seems to be the lack of appropriate and consistent training incorporated into the EFL pre- and in-service teacher training schemes on the nature of specific learning difference/difficulty—dyslexia as well as on the effective techniques for teaching and assessing dyslexic foreign language learners.

Most students with dyslexia could become regular beneficiaries of educational systems that aspire to be inclusive. This would entail introducing educational provisions aimed at minimizing and softening dyslexic difficulties in order to allow them to demonstrate their full potential. The accommodations would vary depending on the type and severity of difficulties they experience. Some students with dyslexia would welcome just minimal alterations to feel relatively comfortable in the educational environment, while others might need a much more individualized approach, for example one-to-one teaching. Introducing the appropriate enabling solutions, well-matched to the type and severity of difficulties cannot be accomplished without understanding, engagement and collective effort of all the parties involved—parents, teachers, policy makers and students themselves. It needs stressing that well-trained teachers hold great potential for forming fertile ground and offering enhancement of the overall mental, psychological, and social development of their students through softening disharmonies and reducing scholastic failure.

1.2 DysTEFL Project

The *DysTEFL—dyslexia for teachers of English as a foreign language* project is a Comenius multi-lateral project whose aim is to reinforce support for dyslexic foreign language learners in mainstream education through EFL teacher training. The project has been undertaken by a consortium of seven partners from six European countries—Poland, the UK, Germany, Austria, Hungary and the Czech Republic working to improve the pre- and in-service training of teachers of English as regards working with dyslexic learners and in that way to enhance the quality of language teaching offered to these learners.

The major objectives of the project include: conducting a detailed training needs analysis; then, based on the needs analysis outcomes, designing the overall structure of the course and course content for initial training and continuing professional development of teachers of English as a foreign language. The indirect goal is to improve the situation of dyslexic language learners in foreign language classrooms and enhance their chances for successful foreign language learning. The training materials—the course—is available in three different modes, namely the face-to-face course mode, the online self-study course mode (static website) and the interactive Moodle course mode, all of which provide trainees with both theoretical and practical parts and opportunities to share and exchange experiences and learn from each other. The target audience of this project includes pre- (university and college students studying to become foreign language teachers) and in-service teachers of English as a foreign language, institutions of higher education, local, regional, national and international institutions and associations preoccupied with the professional training of foreign language teachers, as well as educational stakeholders and authorities.

The overall aim of the study on EFL (English as a foreign language) teacher professional training needs was to identify the EFL pre- and in-service teacher professional development needs with regard to teaching English as a foreign language to learners with dyslexia. Data was collected with the use of desk research and an online questionnaire survey for teachers. The desk research analysis (not discussed in this chapter) involves information on the current approaches in foreign language teacher education towards preparing teachers for working with dyslexic learners, available courses at teacher training institutions as well as legal regulations concerning dyslexia in education with a particular emphasis on foreign language teaching. The online questionnaire (the results of which are discussed in detail in this chapter) was used to collect data on the EFL pre- and in-service teachers' perceptions of their knowledge and experience of dyslexia as well as their professional development needs and preferences (including the course format and content) regarding foreign language provision to students with dyslexia.

The impact of the DysTEFL project is that its activities and products can considerably add to closing the apparent gap in foreign language teacher training schemes. The need for more specialized training with regard to dyslexia and

teaching foreign languages to dyslexic individuals has been voiced by both teachers and teacher training authorities. Enhancing the level of awareness, knowledge and skills of the target group of teachers of English as a foreign language should translate into maximizing the quality of teaching. In that way, the project follows the European educational priorities of reinforcing support and inclusion education for learners with special educational needs. Regional, national and international institutions and associations preoccupied with initial and in-service teacher training can easily access the materials (www.dystefl.eu) and use them in their training schemes.

The project's outputs serve as a point of reference for educational policy makers, research institutes, authorities, teacher trainers and materials designers. The project supports improvements in European teacher training schemes, which clearly lack the component devoted to teaching dyslexic foreign language learners, which is consistent with national and EU educational priorities.

2 Method

The study has been conducted mainly among the pre- and in-service EFL teachers from six European countries where institutions participating in the DysTEFL project are located but also several student teachers and practicing teachers from the countries outside the project partnership took part in the survey. Data has been collected with the use of an online survey for teachers whose key findings are discussed and characterised in this chapter.

The specific goal of the present study was to collect information concerning the EFL pre- and in-service teachers' perceptions of their knowledge of dyslexia, their experience with dyslexic foreign language learners as well as their overall confidence in teaching and assessing such individuals. In addition, the study aimed at identifying EFL pre-service and in-service teachers' needs and preferences with regard to training, including its format and content, which would equip them with the necessary knowledge about dyslexia and skills to work with dyslexic learners.

2.1 Participants

Overall more than 400 responses have been collected through the online survey; however, some of them were incomplete (respondents started filling the online questionnaire but did not finish it), and some lacked answers to one or more questions. Such cases have been excluded from the analysis in the present study; only complete questionnaires, including answers to all the questions were taken into account, limiting the number of analyzed responses to 292.

The participants of the study were 292 pre-service teachers—university and teacher training college final year BA and MA students studying to become

teachers of English as a foreign language (some of them already with some teaching experience) as well as in-service teachers of English as a foreign language. The respondents' teaching experience (measured in years of teaching) ranged from none to well over 10 years; the majority of participants were experienced teachers (see Table 1 and Fig. 1). Most of respondents teach or study to teach English as a foreign language in the project partner countries (Poland, Austria, Germany, Hungary, the Czech Republic and the UK) but also in the countries outside the partnership (Cyprus, Greece, Ireland, Italy, Spain, the Netherlands) (see Table 2 and Fig. 2).

Participants who are practicing teachers teach at primary, secondary and tertiary level, mainly in primary schools (37 %), lower-secondary schools (40 %), upper-secondary schools (39 %) but also at colleges or universities (13 %) and in language schools (20 %) (see Fig. 3). Frequently they work in more than one school (e.g. primary school and lower-secondary school, primary school and language school, primary school, lower-secondary school and upper-secondary school, lower-secondary school and university, etc.), which means that they teach students at different ages. The greatest number of respondents teach students who are 10–15 years old (53 %) and 15–19 years old (48 %), only 9 (3 %) teachers work with children younger than six. 79 (27 %) and 73 (25 %) teachers teach students aged 6–10 and over 20 respectively (see Fig. 4).

When reporting on their past and planned teaching experience with foreign language learners with dyslexia, 208 (71 %) respondents admitted that they either had already taught or were going to teach classes where there were some students with dyslexia. 24 (8 %) teachers taught or were going to teach classes with students who were exempted from assessment because they had dyslexia; 6 (2 %) teachers taught or were going to teach special classes for learners with dyslexia and 21 (7 %) provided or were going to provide individual tuition for learners with dyslexia in a form of one-to-one sessions. At the same time, as many as 79 (27 %) respondents claimed that in some of the classes they taught or were going to teach there were no students with dyslexia. 68 (23 %) teachers could not specify what classes they were going to teach the following year (see Fig. 5).

2.2 Instruments

The study involved an online questionnaire. The questionnaire (see Appendix 1) used to collect data for the present study refers to EFL teachers' perceptions of their awareness of dyslexia and experience in working with dyslexic foreign language learners as well as teachers' overall confidence in teaching and assessing such individuals. Teachers' needs and interest in getting further information and training in teaching English to dyslexic foreign language learners and their preferences with regard to the format and content of such a training have been identified as well.

Table 1 Respondents' teaching experience

Respondents' teaching experience	less than 2 years N (%)	3–5 years N (%)	6–10 years N (%)	more than 10 years N (%)
Total: 292 (100)	38 (13)	50 (17)	49 (17)	155 (53)
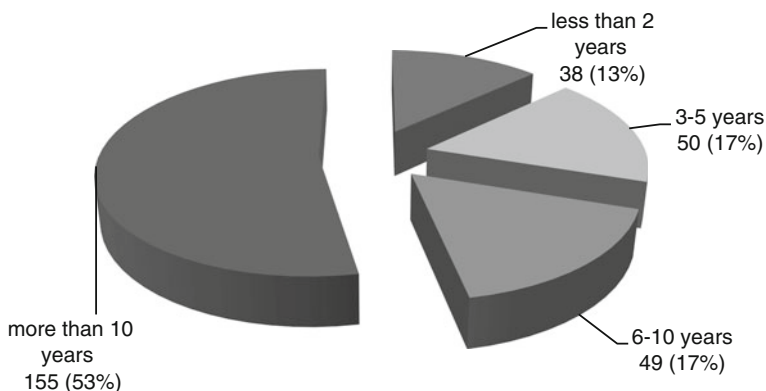
Fig. 1 Respondents' teaching experience

Table 2 Countries where respondents teach or study to teach English as a foreign language

Country	N (%)
Austria	27 (9)
Cyprus	2 (1)
Germany	32 (11)
Greece	2 (1)
Hungary	118 (40)
Ireland	1 (0)
Italy	6 (2)
Poland	57 (20)
Spain	2 (1)
The Czech Republic	32 (11)
The Netherlands	1 (0)
The UK	12 (4)
Total	292 (100)

The questionnaire consists of three parts, the first (part A) of which collects information on the respondents' teaching experience (in years), the type of school(s) they teach at, the age of their students, the country where they teach or study to teach English as a foreign language, and, finally, on the type of teaching experience concerning dyslexic language learners they have or plan to have. The last one can for instance involve teaching regular classes where some students are dyslexic or teaching dyslexic foreign language learners in one-to-one sessions, etc.
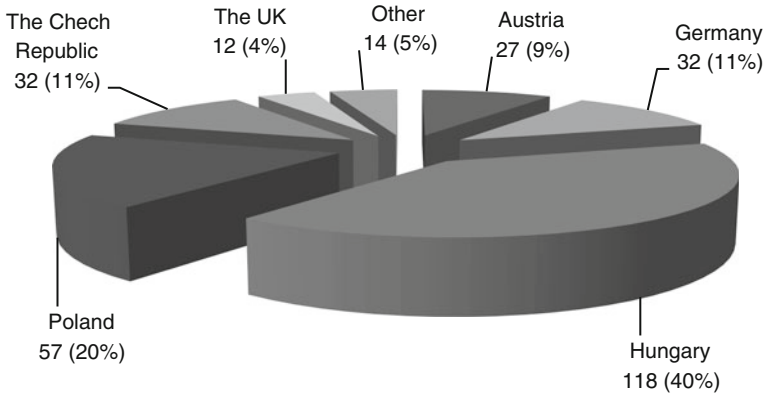
Fig. 2 Countries where respondents teach or study to teach English as a foreign language
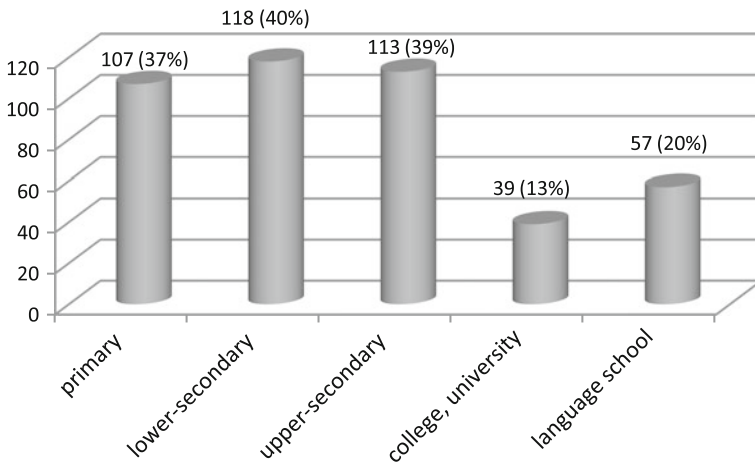
Fig. 3 Types of schools where respondents teach English as a foreign language (respondents could select more than one type of school)

Respondents can select more than one answer to the questions concerning the type of school and the age of students they teach as well as the type of teaching experience.

In the second part of the questionnaire (part B), the respondents are asked to consider 20 five-point Likert scale statements. These item have been designed to measure teachers' perceived abilities, knowledge, skills and experience with reference to EFL and dyslexia. Teachers report on the way they approach students with dyslexia, on their awareness and use of appropriate accommodations in teaching and assessment that dyslexic individuals are entitled to, and on the professional training regarding dyslexia they received and would like to receive.
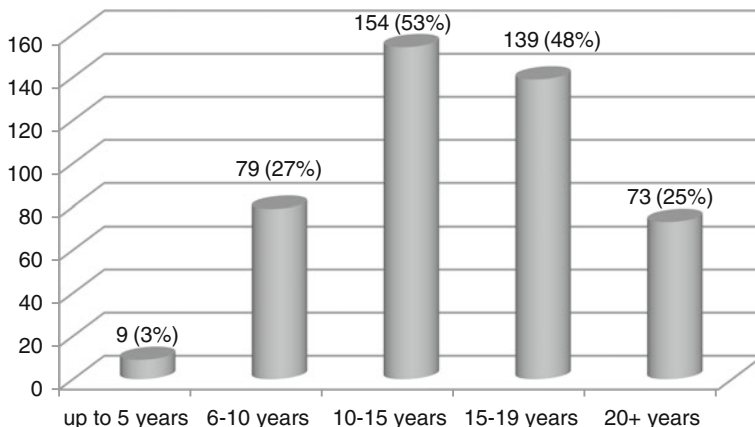
Fig. 4 Age groups of students that respondents teach (respondents could select more than one age group of students)
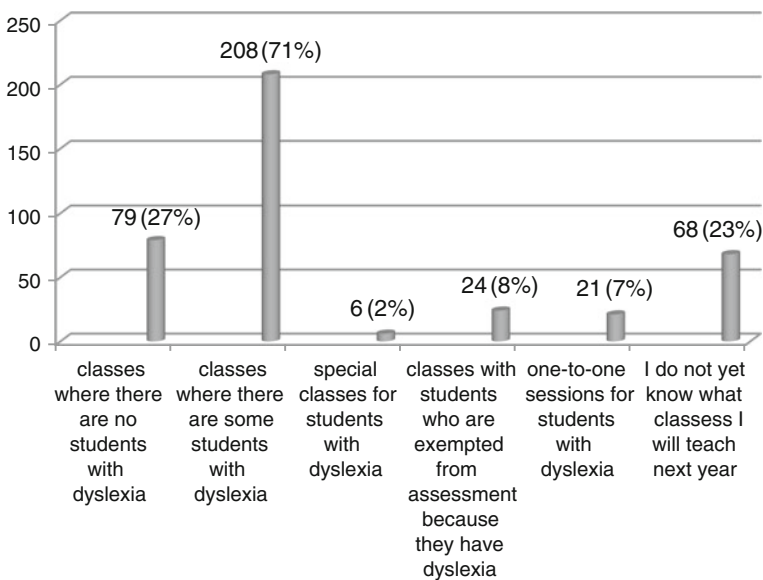
Fig. 5 Respondents' past and planned teaching experience with EFL learners with dyslexia—types of classes they taught or were going to teach (respondents could select more than one type of class)

To indicate their answers, respondents choose the most appropriate number on the scale, where: 1 = 'definitely not true of me', 2 = 'mostly not true of me', 3 = 'sometimes true and sometimes not true of me', 4 = 'mostly true of me', and 5 = 'definitely true of me'. The maximum number of points that can be obtained

on a scale is 100, while the minimum is 20. The scale reliability assessed in terms of Cronbach's coefficient alpha is 0.89.

The final part of the questionnaire (part C) comprises three questions concerning the detailed training needs of the respondents with reference to EFL and dyslexia. Respondents mark their preferences regarding the course format/mode (e.g. self-study, online interactive, face-to-face), content (issues and topics that the course should cover), and types of materials and activities (e.g. reading, video, lectures, evaluating and designing materials and lesson plans) which they would find most useful. More than one answer can be selected for the last two questions.

Finally, the respondents who are interested in learning more about the DysTEFL project and the EFL teacher training materials/course may provide their personal details such as name, institution and e-mail address so that they can be contacted when the materials are designed.

2.3 Procedure

The questionnaire was administered online with the use of the Survey Monkey application (https://www.surveymonkey.com/) for a limited time of 8 weeks—in January and February 2012. Completing of the survey was voluntary. The respondents were provided with a link to the DysTEFL needs analysis questionnaire directly by the project partners; alternatively, the project partners could distribute the questionnaire's printed version (see Appendix 1) and then enter the data of each respondent who filled the printed version into the online questionnaire. In that way, all the responses were collected in an online mode. The information about and the link to the DysTEFL needs analysis questionnaire was also available at the project website (www.dystefl.eu) and respondents from both the project partners' countries and from the countries outside the partnership were invited to take part in the survey and submit their answers. Any student teacher and practicing teacher willing to voice their opinion with regard to their professional needs concerning EFL and dyslexia could do so through the online questionnaire. The project partners also disseminated the information concerning the project objectives and activities, including the needs analysis survey, among the stakeholders and interested parties, for example, teacher training organizations, universities, colleges, teacher associations and schools to secure wide awareness and interest among EFL teachers.

2.4 Analysis

The data was computed by means of the statistical program STATISTICA, with the main operations being descriptive (means and standard deviations) and inferential (*t*-test for independent samples) statistics. The breakdowns one-way

ANOVA (F test), typically used as an exploratory data analysis technique, was employed as well. Although for exploratory data analysis, breakdowns can use more than one independent variable, the statistical procedures in breakdowns assume the existence of a single grouping factor. Thus, those statistics do not take into account any possible interactions between grouping variables. The breakdowns one-way ANOVA (F test) and post hoc comparisons of means were calculated to see which of the means contributed to the effect of teaching experience and country where respondents teach or study to teach (which groups are particularly different from each other) on the questionnaire (part B) results. The t-test for independent samples was used to calculate whether the differences between less and more experienced teachers with regard to their questionnaire (part B) answers were statistically significant (StatSoft Inc. 2013; Seliger and Shohamy 1989; Clegg 2004; Dörnyei 2007).

3 Results and Discussion

Table 3 presents means (M) and standard deviations (SD) for the questionnaire items 1–20 in part B—overall and according to teaching experience.

Table 4 shows the results of the comparison between four groups of respondents with different teaching experience: group 1—respondents with less than 2 years of teaching experience, group 2—respondents with 3–5 years of teaching experience, group 3—respondents with 6–10 years of teaching experience, and group 4—respondents with over 10 years of teaching experience. The effect of teaching experience defined as the number of years of teaching was not significant ($F = 2.31$, $p = 0.07$). Post-hoc analysis ($p = 0.02$) and t-test for independent samples ($t = 2.07$, $p = 0.04$) indicated that only the respondents with most limited teaching experience (group 1) differed significantly from their most experienced colleagues (group 4). The least experienced respondents seemed advantaged in comparison to other groups of respondents, especially the most experienced teachers (Q2 and Q4 M = 2.0, SD = 1.38), in that they reported having received relevant training on dyslexia during their studies (Q2 and Q4 M = 3.72, SD = 1.41). Having reported that, rather unsurprisingly, they also scored higher than the other groups with reference to questionnaire items dealing with perception of teachers' knowledge and awareness of the nature of dyslexia and dyslexic difficulties (M = 3.27, SD = 1.09). Even though they indicated the need for training (Q5, Q11 and Q20 M = 3.98, SD = 0.90), it was not as pronounced as in the case of the most experienced teachers (Q5, Q11 and Q20 M = 4.24, SD = 1.13) who admitted that they received very little training on EFL and dyslexia.

The effect of the country where the participants teach or study to teach on their overall responses to part B of the survey was statistically significant ($F = 8.18$, $p = 0.00$) (only the influence of the countries with more than 10 respondents are discussed). Post-hoc analysis revealed significant differences between respondents

Table 3 Descriptive statistics—means (M) and standard deviations (SD) for questionnaire items 1–20 in part B—overall and according to teaching experience (groups 1, 2, 3, 4)

Questionnaire items	Overall (N = 292)		Less than 2 years (1) (N = 38)		3–5 years (2) (N = 50)		6–10 years (3) (N = 49)		Over 10 years (4) (N = 155)	
	M	SD	M	SD	M	SD	M	SD	M	SD
1	2.79	1.34	2.71	1.18	2.82	1.38	3.27	1.29	2.66	1.35
2	2.69	1.60	3.97	1.36	2.92	1.55	2.82	1.52	2.25	1.51
3	2.49	1.21	2.63	1.10	2.62	1.18	2.59	1.04	2.38	1.28
4	2.22	1.47	3.45	1.46	2.64	1.52	2.35	1.44	1.74	1.24
5	4.31	1.06	3.37	0.91	4.24	1.05	4.37	1.09	4.30	1.09
6	3.99	1.11	4.26	0.95	3.72	1.17	4.08	0.86	3.99	1.18
7	3.94	1.14	4.32	0.87	4.02	1.05	3.82	1.09	3.86	1.22
8	3.58	1.12	3.38	1.22	3.66	1.01	3.65	1.11	3.55	1.14
9	2.70	1.08	2.76	1.10	2.76	0.95	2.84	0.99	2.62	1.16
10	2.90	1.17	3.11	1.11	2.92	1.16	2.94	1.13	2.84	1.19
11	4.40	0.99	4.42	0.89	4.32	0.97	4.53	0.84	4.36	1.07
12	3.20	1.20	3.34	1.05	3.06	1.19	3.47	1.14	3.12	1.24
13	3.60	1.25	3.63	1.00	3.38	1.13	3.76	1.28	3.62	1.34
14	4.00	1.21	3.87	1.12	3.88	1.27	4.27	1.15	3.99	1.21
15	3.88	1.27	3.84	1.20	3.68	1.39	4.06	1.14	3.90	1.28
16	3.00	1.27	3.21	1.04	2.92	1.20	3.04	1.24	2.95	1.36
17	3.00	1.30	3.00	1.07	2.86	1.15	3.20	1.27	2.99	1.41
18	2.87	1.39	2.58	1.15	2.80	1.22	2.98	1.40	2.94	1.48
19	2.34	1.30	2.42	1.13	2.34	1.23	2.37	1.27	2.30	1.37
20	4.15	1.13	4.16	0.87	4.20	1.06	4.41	1.00	4.06	1.24
Total	3.30	1.23	3.48	1.09	3.29	1.19	3.44	1.16	3.22	1.27

Table 4 Between-group comparisons of the questionnaire results (items 1–20 in part B) with regard to teaching experience

Teaching experience	N	M	SD	t	p
Less than 2 years (1) × 3–5 years (2)	N(1) = 38	M(1) = 3.48	SD(1) = 0.61	1.30	0.20
	N(2) = 50	M(2) = 3.29	SD(2) = 0.74		
Less than 2 years (1) × 6–10 years (3)	N(1) = 38	M(1) = 3.48	SD(1) = 0.61	0.30	0.76
	N(3) = 49	M(3) = 3.44	SD(3) = 0.67		
Less than 2 years (1) × over 10 years (4)	N(1) = 38	M(1) = 3.48	SD(1) = 0.61	2.07[*]	0.04
	N(4) = 155	M(4) = 3.22	SD(4) = 0.72		
3–5 years (2) × 6–10 years (3)	N(2) = 50	M(2) = 3.29	SD(2) = 0.74	−1.06	0.29
	N(3) = 49	M(3) = 3.44	SD(3) = 0.67		
3–5 years (2) × Over 10 years (4)	N(2) = 50	M(2) = 3.29	SD(2) = 0.74	0.59	0.56
	N(4) = 155	M(4) = 3.22	SD(4) = 0.72		
6–10 years (3) × Over 10 years (4)	N(3) = 49	M(3) = 3.44	SD(3) = 0.67	1.90	0.06
	N(4) = 155	M(4) = 3.22	SD(4) = 0.72		

[*] indicates statistical significance at the 0.05 level ($p < 0.05$)

from Austria and the following countries: Hungary ($p = 0.04$), Poland ($p = 0.00$)

and the Czech Republic ($p = 0.00$) as well as between the Czech Republic and Germany ($p = 0.03$). Table 5 demonstrates the stionnaire responses divided into four categories of questions across countries, including all items, items concerning perceptions on received training, items regarding perceived level of knowledge and experience with dyslexia, and items referring to the perceived need for further training. The most pronounced difference between teachers from Germany (M = 1.75, SD = 0.35) and the Czech Republic (M = 3.75, SD = 0.97) refers to the training they received on dyslexia in the course of their professional development. German teachers unanimously report that they underwent much more limited training in comparison to teachers from the other countries. All respondents, irrespective of the country where they teach, expressed the need for further training on EFL and dyslexia. The training needs of Austrian teachers seemed the least conspicuous (M = 3.99, SD = 0.52), even though they admitted that their previous training was rather restricted (M = 2.26, SD = 0.42). In addition, they perceived their knowledge and experience with EFL and dyslexia as rather low (M = 2.64, SD = 0.78).

Moving on now to a more thorough discussion of overall responses to particular questionnaire items, questions 2 (Q2 M = 2.69, SD = 1.60)[2] and 4 (Q4 M = 2.22, SD = 1.47) concern the training that teachers received at college, university or other teacher training institution. Most of them (over 60 %) admitted that they were provided with no or very little training on dyslexia during their studies. Importantly, there is a noticeable difference between the answers of the least (less than 2 years) (Q2 M = 3.97, SD = 1.36; Q4 M = 3.45, SD = 1.46) and the most experienced (over 10 years) (Q2 M = 2.25, SD = 1.51; Q4 M = 1.74, SD = 1.24) groups of teachers. This may suggests that the issue of the EFL and dyslexia may be gradually and very slowly entering teacher training schemes, while it is rather evident that it was absent from EFL teacher education in not so distant past.

Only about 20–35 % of the teachers claimed that they were familiar with the accommodations (usually enforced by the ministerial regulations) that students with dyslexia are entitled to concerning their functioning at school, including foreign language study (Q17 M = 3.00, SD = 1.30), national school leaving exams (Q18 M = 2.87, SD = 1.39), and foreign language proficiency exams (Q19 M = 2.34, SD = 1.30). At the same time over 50 % of respondents seem to, more or less intuitively, execute some of the possible accommodations/enabling solutions, for example they tend to provide extra time if needed for written tasks (Q14 M = 4.00, SD = 1.21) or tend not to lower the mark for spelling mistakes (Q13 M = 3.60, SD = 1.25).

Several questions referred to teachers' perceived familiarity with/knowledge of the nature of dyslexia and their experience with dyslexic foreign language learners.

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[2] Overall means (M) are cited and discussed unless otherwise stated. Q2 M stands for the mean (M) for question 2. See Table 3 for means (M) and standard deviations (SD) for all questionnaire items—overall and according to teaching experience.

Table 5 Means (M) and standard deviations (SD) of questionnaire responses divided into four categories of questions across countries

Country	N	Respondents perceptions							
		Overall (all items)		Received training (items 2, 4)		Knowledge and experience (all items except for 2, 4, 5, 11, 20)		Need for further training (items 5, 11, 20)	
		M	SD	M	SD	M	SD	M	SD
Hungary	118	3.35	1.24	2.24	0.55	3.28	1.10	4.42	0.33
Poland	57	3.55	1.20	2.85	1.26	3.48	1.09	4.38	0.45
Germany	33	3.13	1.35	1.75	0.35	3.13	1.16	4.09	0.62
The Czech Republic	32	3.65	1.12	3.75	0.97	3.52	1.07	4.24	0.37
Austria	27	2.80	1.00	2.26	0.42	2.64	0.78	3.99	0.52
The UK	12	2.90	1.32	2.00	0.35	2.77	1.05	4.17	0.74

Almost 70 % of respondents believed that they were generally aware of the difficulties dyslexic learners experience in EFL learning (Q6 M = 3.99, SD = 1.11) and that they could define the term 'dyslexia' (Q7 M = 3.94, SD = 1.14). Again, teachers with the least teaching experience (student teachers) seemed to demonstrate higher levels of awareness of these issues (Q6 M = 4.26, SD = 0.95; Q7 M = 4.32, SD = 0.87) than their more experienced colleagues, which again could be a sign of recent incorporation of the issues of teaching students with learning differences such as dyslexia into the teacher training schemes. At the same time, when asked more specifically about the ways of enhancing/developing learning strategies of dyslexic EFL students, fewer than 20 % (Q9 M = 2.70, SD = 1.08) of teachers, irrespective of their teaching experience, admitted that they knew how to approach this task. Similarly, fewer than 30 % were not in doubt with regard to the ways EFL students with dyslexia should be assessed (Q10 M = 2.90, SD = 1.17).

Quite surprisingly, only about 30 % of respondents admitted that they often encountered learners with dyslexia in their classes (Q1 M = 2.79, SD = 1.34), while over 50 % claimed they did not often deal with dyslexic students in their daily work. This is rather unexpected in light of the data concerning the prevalence of dyslexia in school population (5–10 %; IDA (2013) indicates that even as many as 15–20 % of the population as a whole shows some symptoms of dyslexia). This could mean either that the respondents indeed work with classes where there are few or no learners with dyslexia or that teachers' awareness and ability to recognize the worrying signs of this learning difficulty may be limited. In addition, respondents' answers to question 1 in part B do not seem to be consistent with their opinions expressed in part A of the questionnaire (question 4). 27 % of them claimed that they taught or were going to teach classes where there were no learners with dyslexia, while as many as 71 % acknowledged that they taught or were going to teach classes where there were some dyslexic learners (see Table 5). In addition, over 50 % of teachers claimed that they were able to recognize

dyslexic learners in the classes they teach (Q8 M = 3.58, SD = 1.12) and about 40 % were convinced that they knew what to do if they learnt that one of their students had dyslexia (Q12 M = 3.20, SD = 1.20). Further reporting on their experience with dyslexic language learners, very few teachers agreed that they were able to develop their own techniques (Q3 M = 2.49, SD = 1.21) for teaching English as a foreign language to learners with dyslexia. More of them seemed to be aware of how to apply the principles of multisensory teaching and learning (Q16 M = 3.00, SD = 1.27).

Questions 5 (Q5 M = 4.31, SD = 1.06), 11 (Q11 M = 4.40, SD = 0.99) and 20 (Q20 M = 4.15, SD = 1.13) refer to the EFL teachers' professional training needs with regard to dyslexia. A great majority (over 80 %) of teachers, irrespective of the length of their teaching experience voiced a clear wish for and interest in further training in the area of teaching English as a foreign language to learners with dyslexia. Teachers felt they needed more information on the appropriate language teaching methods and techniques that proved effective in teaching foreign languages to learners with dyslexia. They also expressed their readiness to read materials on foreign language teaching approaches to dyslexic learners if/when they are available and to take part in the training sessions.

The following part of the chapter presents the results of the part C of the questionnaire dealing with the respondents' specific needs and preferences concerning the format/mode and content of the course/training materials on EFL and dyslexia (see Table 6 and Figs. 6, 7, 8). Overall, the majority of respondents (42 %) chose the face-to-face mode of the course as the most useful and favorable of all. 30 % of teachers would appreciate the online resources that they could use for self-study, while 16 % found printed self-study materials advantageous and convenient. Online learning course (e.g. the Moodle mode/format) attracted the attention of 12 % of respondents.

The respondents expressed their needs, interests and wishes pertaining to the issues they would find relevant and would appreciate if they were covered in the training course content (see Fig. 7); they could select more than one topic. The overwhelming majority of teachers agreed that they would benefit most from the training materials on language teaching techniques that assist dyslexic language learners (84 %) and on general teaching principles regarding these learners and classroom management tips (78 %). The following three points also received considerable attention from teachers who would gladly see them as part of their professional training: problems that dyslexia causes in language learning (68 %), assessment of dyslexic learners in the language classroom (66 %), and learning difficulties associated with dyslexia (53 %). The following matters triggered the least profound interest among teachers: the nature of dyslexia (27 %), how dyslexia is diagnosed (32 %) and accommodations dyslexic students are entitled to in high-stake exams (30 %). Still, about one third of respondents would enjoy these topics as regular components of the training materials. Additionally, the respondents themselves suggested that they would like to learn about the strategies for enhancing motivation, boosting self-assessment and the sense of achievement in dyslexic foreign language learners, about helping them to deal with the feeling of
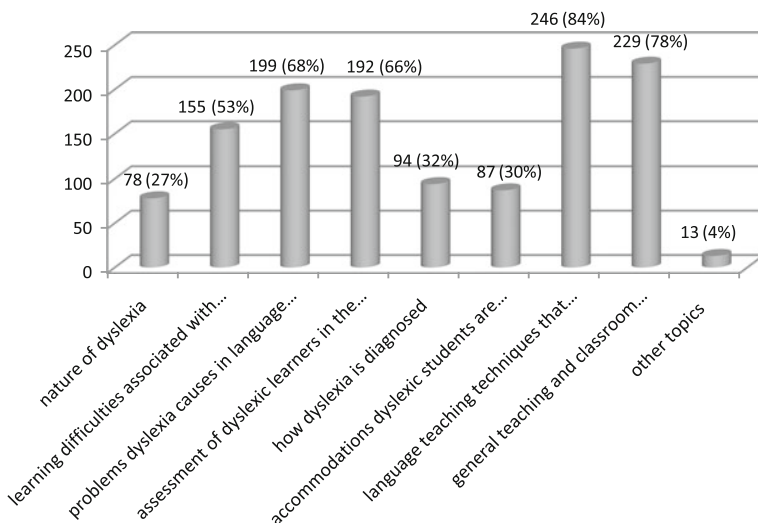
Table 6 Respondents' course mode preferences

Course mode preference	Overall N (%)	Less than 2 years (1) N (%)	3–5 years (2) N (%)	6–10 years (3) N (%)	Over 10 years (4) N (%)
Printed self-study materials	46 (16)	8 (21)	5 (10)	9 (18)	24 (15)
Online learning course	34 (12)	2 (5)	8 (16)	4 (8)	20 (13)
Online resources that I can use for self-study	88 (30)	9 (24)	18 (36)	14 (29)	47 (30)
Face-to-face training workshop	124 (42)	19 (50)	19 (38)	22 (45)	64 (41)
Total	N = 292	N = 38	N = 50	N = 49	N = 155
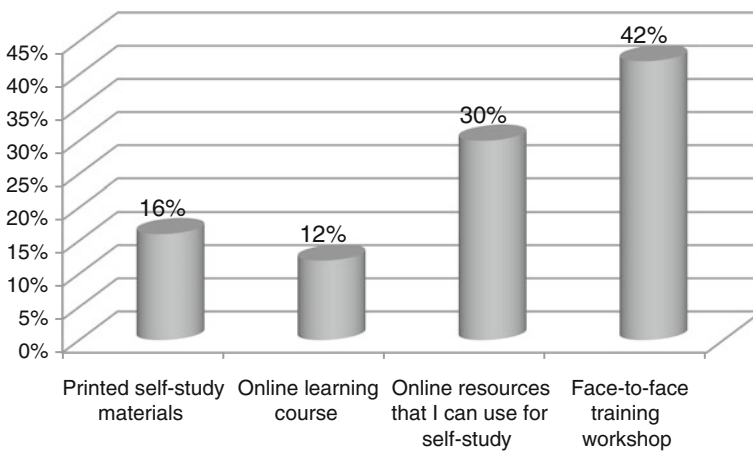
Fig. 6 Respondents' course mode preferences

failure, being ashamed and considered (surprisingly often) intellectually challenged. They would appreciate advice from more experienced teachers on the specific types of activities that proved useful and effective in their teaching practice as well as they would welcome more detailed descriptions of particular case studies. Importantly, teachers also voiced the need for advice on how to involve parents of their dyslexic learners, how to deal with adult dyslexic foreign language learners and how to raise awareness of dyslexia in the workplace.

Respondents were invited to signal which types of tasks and activities they would perceive as most desirable and inspiring in the training course (see Fig. 8). Learning how to design language teaching materials for dyslexic language learners (78 %), followed by watching videos of classrooms (67 %) and designing lesson plans for classes with dyslexic learners (59 %) evoked the greatest enthusiasm. 56 % felt they could benefit from listening to/reading interviews with teachers of dyslexic language learners or with the learners (49 %). Teachers seemed to value

Fig. 7 Respondents' preferences with regard to the issues and topics covered in a training course (respondents could choose more than one answer)

more brief lectures (49 %) or reading online resource materials (40 %) than reading articles (30 %) or book chapters (20 %) as part of the training. They were also more eager to learn through evaluating language teaching materials designed for learners with dyslexia (45 %) rather than through evaluating lesson plans (32 %).

189 (65 %) of respondents provided their personal details such as name, institution and e-mail address so that they can be contacted when the EFL teacher training materials/course in order to get access to them.

4 Conclusions and Implications

In view of the scarcity of research in this area, the primary aim of the study was to investigate how the EFL pre- and in-service teachers perceive and evaluate their knowledge of dyslexia, their experience with dyslexic foreign language learners as well as their overall confidence in teaching and assessing such individuals. In addition, the study aimed at identifying the EFL pre-service and in-service teachers' needs and preferences with regard to training, including its format and content, which would equip them with the necessary knowledge about dyslexia and skills to work with dyslexic learners.

The results must be interpreted with caution as the analyzed data were based on self-report measure where teachers indicated their perceptions. Such self-reported perceptions may not very accurately reflect the actual level of teacher knowledge
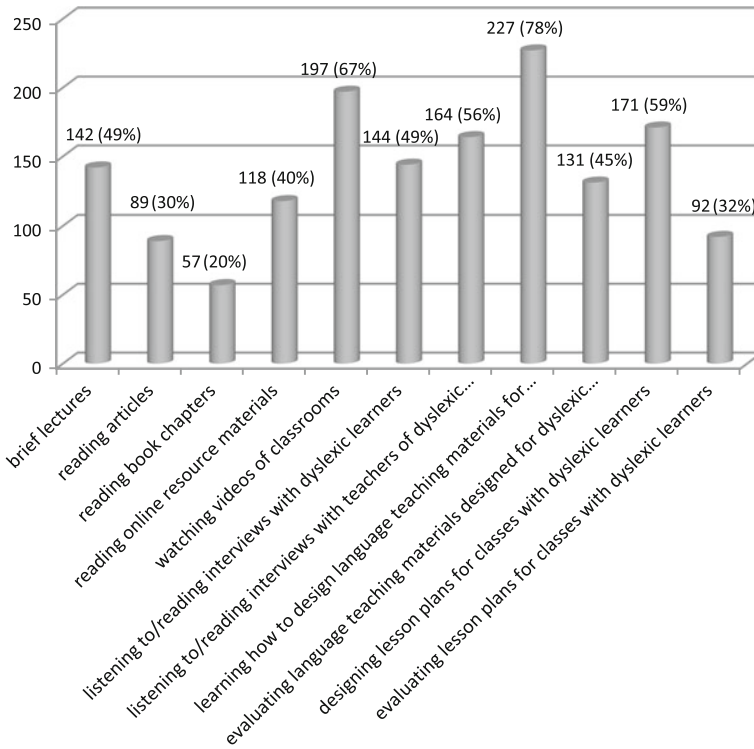
Fig. 8 Respondents' preferences with regard to the types of activities in a training course (respondents could choose more than one answer)

and skills (Cunningham et al. 2009). Teachers may find it troublesome to precisely evaluate their knowledge and skills. In fact, their perception may differ from the gains on tests verifying such knowledge and skills (Cunningham et al. 2004). In addition, self-report measures invite respondents to provide answers that are more socially acceptable, which is referred to as social desirability bias (Washburn et al. 2011a).

The great majority of the study participants either taught or were going to teach in mainstream classes where there were some dyslexic students. At the same time, these respondents admit that the pre- and in-service teacher training that they underwent did not sufficiently equip them with the necessary knowledge about the nature of dyslexia, difficulties that dyslexic learners encounter in foreign language study and suitable teaching approaches and techniques. Most of the respondents perceived their levels of confidence, knowledge and experience with regard to identifying, teaching and assessing dyslexic individuals as rather low. The vast majority of the respondents voiced a clear need and interest in undertaking further professional training on teaching English to dyslexic students. No statistically significant differences have been observed between four groups of teachers with

varying teaching experience with regard to their questionnaire responses with one exception only. Namely, the least experienced respondents considerably differed from the most experienced teachers in that they seemed to have been provided with more relevant training on the theoretical aspects of dyslexia during their studies than their more experienced colleagues. Notwithstanding their perceived broader theoretical knowledge on dyslexia, similarly to all the other respondents, the least experienced teachers and student teachers turned out to be highly interested in deepening their knowledge and developing skills in further training. Importantly, findings of other studies (McCutchen and Berninger 1999; McCutchen et al. 2002a, b, 2009) clearly show that collaborative on-going professional development that focuses on improving the areas of weakness, delineates research-based instructional techniques, and offers opportunities for practice and feedback promises changes in teachers' instructional practices and, in turn, in the level of students' achievement. The country where respondents teach or study to teach influenced their questionnaire responses. This might be connected with the general level of awareness of dyslexia and difficulties that dyslexic learners experience in foreign language study. In some countries these issues have already been signaled during teacher training (e.g. in the Czech Republic or Poland), while they still do not seem to be given sufficient attention in the training schemes in other countries (e.g. Germany or the UK). Rather low perceived level of knowledge and experience with dyslexia that teachers report (e.g. in Austria or the UK) seems to reflect this. Still, regardless of the country where they teach and their perceived knowledge of dyslexia, it is apparent that teachers clearly recognize the need for and importance of further training.

   The findings of the present study strongly confirm the need to develop a course and materials on EFL and dyslexia that could be incorporated into schemes of initial and in-service foreign language teacher training and used by teacher training institutions, colleges and universities. The major objective of the DysTEFL project is to design such a course and make it available to all interested parties. Bearing in mind the respondents' preferences, it seems that the course should be created so that it is flexible enough to be congruous with and relevant for different educational contexts. This means that the course and materials should most preferably be fitting into both pre- and in-service training programs. In addition, they should be suitable and applicable for teachers working at different types of schools (primary, secondary, tertiary level of education). The materials need to be based on sound research findings and provide a solid theoretical background. Importantly, the expressed respondents' preferences with regard to the issues and topics that should be covered in such a course as well as their clear choice of most useful and appreciated types of tasks and activities constitute a considerable help in designing the materials. Last but not least, it seems that the course format/mode cannot be limited to one option only as there appear to be great demand for different formats. Preferably, the course should be available in different formats, including a face-to-face training sessions mode (preferred by the majority of respondents), an online self-study mode with printable self-study materials as well as an online learning (Moodle) course.[3]

The outcomes of the study bear implications for higher education authorities and teacher training institutions responsible for designing professional training schemes and for preparing future and practicing EFL teachers for working with dyslexic students. Such schemes cannot fail in providing sufficient and appropriate (research-based) content knowledge of basic linguistic concepts (e.g. constructs related to reading, such phonological awareness or alphabetic principle) and dyslexia.

From a European perspective, an attempt to tackle the issue of preparing teachers of English as a foreign language to adapt their teaching approaches to the specific needs of students with dyslexia is crucial. The DysTEFL project is implemented through the interaction and cooperation between the partners from European countries bringing to the project activities different education/teaching traditions and practices, as well as perspectives on teacher training principles and priorities. The project outputs are promoted and disseminated to a wider educational community in Europe, e.g. networks of cooperation among teachers, educational stakeholders, initiatives, associations and organizations. The target user group—teachers of English as a foreign language are directly involved in project activities such as needs analysis and piloting the training materials.

Education and training play a key role in achieving the priorities set out in the Europe 2020 Strategy, which as one of its five headline targets aims at reducing the share of early school leavers. We believe that this project contributes to this priority in that it develops a training course for teachers of English as a foreign language in order to raise their awareness, knowledge and skills with respect to the appropriate teaching methods and techniques which proved effective in working with dyslexic foreign language learners. In this way, special educational needs of these learners can be catered for, at the same time, indirectly reducing early school leaving.

The project's activities are also consistent with the Europe 2020 Flagship: an agenda for new skills whose aim is to make it easier for people to get the right skills and competences and to be able to use them in appropriate jobs. To do this, it is important to make the best possible predictions about what skills will be needed in the future and to help people develop those skills through education and training. The project recognizes that dyslexic learners require appropriate training with regard to foreign languages as foreign language competence might determine future job opportunities. Also with respect to the skills and competences of foreign language teachers, the project highlights the areas which have apparently been neglected so far but seem indispensable for teacher training in the future.

The project aims at improving the quality and efficiency of education and training by enabling dyslexic learners to acquire basic skills and competences such

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[3] At the time when the present text was prepared for publication, the work on the DysTEFL course design was advanced. Three different formats have been prepared with a view to satisfy the needs and preferences of EFL teachers—face-to-face, Moodle and self-study. Drafts of course units are available at the project website (http://course.dystefl.eu/), their final versions will be accessible after the testing phase is completed.

as foreign language command needed for their employability, by ensuring high quality teaching and teacher training at all levels of education and training and by improving attractiveness and efficiency of all levels of education and training. The project promotes equity, social cohesion and social inclusion by addressing educational disadvantage through high quality education, more targeted support and inclusive education.

A.1 5   Appendix 1. DysTEFL Needs Analysis Questionnaire

Part A. Please tick the statement that describes you best. In some questions more than one answer is possible.

1. I teach at (more than one answer is possible)

   - primary school
   - lower-secondary school
   - upper-secondary school
   - college, university
   - language school

2. I have been teaching for

   - less than 2 years
   - 3–5 years
   - 6–10 years
   - more than 10 years

3. Most of my students are aged (more than one answer is possible)

   - up to 5 years
   - 6–10 years
   - 10–15 years
   - 15–19 years
   - 20+ years

4. I have taught/I am going to teach next year (more than one answer is possible)

   - classes where there are no students with dyslexia
   - classes where there are some students with dyslexia
   - special classes for students with dyslexia
   - classes with students who are exempted from assessment because they have dyslexia
   - one-to-one sessions for students with dyslexia

- I do not yet know what classes I will teach next year
5. I teach in………………….. (please give the name of the country)
6. I am training to be a teacher in……………….. (please, give the name of the country)

Part B. Please consider a number of statements referring to working with dyslexic language learners.

Please, tick the most appropriate number on the scale, where

1 = definitely not true of me
2 = mostly not true of me
3 = sometimes true and sometimes not true of me
4 = mostly true of me
5 = definitely true of me

No	Question	1 2 3 4 5
1	I often encounter dyslexic students in my daily work	
2	I learnt about dyslexia during my studies at college/university/other teacher training institutions.	
3	I have developed my own techniques for teaching English to dyslexic students.	
4	I learnt about how to teach English to dyslexic students in my courses at college/university/teacher training institutions.	
5	I feel the need for more information on the language teaching methods to be successfully applied with dyslexic students.	
6	I am aware of the difficulties dyslexic language learners experience in learning English as a second/foreign language.	
7	I can define the term'dyslexia'.	
8	I can recognize a dyslexic student in my English language class.	
9	I know how to develop learning strategies of my dyslexic students.	
10	I know how to assess my dyslexic students.	
11	If there were materials on the language teaching methods helping dyslexic students, I would read them.	
12	I know what to do if I think that one of my students is dyslexic.	
13	I do not assess the spelling of dyslexic students.	
14	I provide extra time for dyslexic students to do a written task.	
15	If it is necessary I assess my dyslexic.	
16	I know how to apply the principles of multisensory teaching and learning.	
17	I am familiar with the accommodations dyslexic students are entitled for in English language lessons.	
18	I am familiar with the accommodations dyslexic students are entitled for at the national school leaving exams.	
19	I am familiar with the accommodations dyslexic students are entitled in taking foreign language proficiency exams.	
20	I am interested in further training in the area of teaching English to students with dyslexia.	

Part C. Training needs. In this part of the questionnaire we are interested in what kind of training you would find useful to help you work with dyslexic language learners.

1. An ideal format of the course on dyslexia and methods of teaching a foreign language to children with specific learning difficulties is:

   - printed self-study materials
   - online learning course
   - online resources that I can use for self-study
   - face-to-face training workshop

2. In a training course on dyslexia I would like to learn about the following (please tick the topics you would find relevant; more than one answer is possible)

   - nature of dyslexia
   - learning difficulties associated with dyslexia
   - problems dyslexia causes in language learning
   - assessment of dyslexic learners in the language classroom
   - how dyslexia is diagnosed
   - accommodations dyslexic students are entitled to in high-stakes exams
   - language teaching techniques that assist dyslexic language learners
   - general teaching and classroom management tips for teaching dyslexic language learners
   - other topic (please indicate what other topics you would be interested in)

3. In a training course I would find the following useful (please tick the tasks and activities you would find relevant; more than one answer is possible)

   - brief lectures
   - reading articles
   - reading book chapters
   - reading online resource materials
   - watching videos of classrooms
   - listening to/reading interviews with dyslexic learners
   - listening to/reading interviews with teachers of dyslexic learners
   - learning how to design language teaching materials for dyslexic learners
   - evaluating language teaching materials designed for dyslexic learners
   - designing lesson plans for classes with dyslexic learners
   - evaluating lesson plans for classes with dyslexic learners

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Part II
Essential Topics in Multilingualism

The Concept of Affordances in Applied Linguistics and Multilingualism

Larissa Aronin

Abstract This chapter continues the line of research on the concept of affordances in applied linguistics and sociology of language, which David Singleton has investigated in recent years (Singleton and Aronin 2007; Aronin and Singleton 2010, 2012a, 2012b; Singleton et al. 2013). The concept of affordances in reference to applied linguistics and multilingualism arouses interest, but studies are still scarce on the ground. The purpose of this chapter is to overview the previous theoretical understanding of affordances, and to expand the perspective further. Along with laying out the significance of this concept for language teaching, learning and use, the chapter will suggest additional practical ways of capitalizing on our understanding of affordances, and look into one particular kind of affordance which material culture offers to language learners, teachers and speakers.

1 Introduction

Applied linguistics and multilingualism are bustling fields of research, and the works of David Singleton are prominent in both. Among the novel topics discussed by David Singleton is the topic of *affordances* (Singleton and Aronin 2007; Aronin and Singleton 2010, 2012a, 2012b). Affordances have caught the attention of some of researchers, and the interest of others, but wider involvement in the topic by more researchers writing about it, is still a matter of the future. Currently, the state

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of affordances research in the fields of applied linguistics and multilingualism, can be described in the joking words of Ogden (1937) summing up the public's attitude towards grammar in 1937 as "a subject for other rhinosceroi".[1]

Though affordances in applied linguistics may seem to be detached from day-to-day practical concerns, and of interest only to specialists, in reality, affordances promise both theoretical and practical breakthroughs, applicable to each and any aspect of applied linguistics and multilingual study. Material affordances are good examples of common affordances which can be deployed for the down- to-earth practical teaching and learning languages.

2 Current View on Affordances in Applied Linguistics and Multilingualism

Affordances are not coming into the limelight by chance, but because of globalization which has brought about the new linguistic dispensation (Aronin 2007; Aronin and Singleton 2008, 2012a; Aronin et al. 2013). *Expansion of affordances* is one of the most visible specific qualities of this new linguistic dispensation (Aronin and Singleton 2012a: 55), and it facilitates the use and acquisition of thousands of languages all over the world. In fact, the expansion of affordances was noticed in the early 20th century, when Huizinga (1936) in his *In the shadow of tomorrow,* noted that our expectation horizon has expanded due to the lens of various sciences.

2.1 What Are Affordances?

In a rather simplistic way, affordances are commonly referred to as 'possibilities for action', but this explanation is far from exhaustive or exact. For a more comprehensive understanding, it is necessary to resort to Gibson's classic definition which he formulated in relation to the physical world: "The *affordances* of the environment is what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill" (Gibson 1979/1986: 127). An illustration of affordances in the human physical world would be a stool, bench, or chair and other knee-high surfaces of support which afford sitting on (Gibson 1979/1986: 128). A table affords writing,

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[1] http://www.crockford.com/wrrrld/begr.html. The subject of Grammar has fallen on evil days, and those whose curiosity leads them to inquire more closely than their fellows into its mysteries are liable to be regarded as a little odd. As far as the public is concerned, they are somewhat in the position of the educationist at the Zoo, who was informing her charges about the idiosyncrasies of the bulkier pachyderms. "And would you kindly tell me", she asked the keeper, "the gender of that rhinsceros". "Madam", he replied, somewhat stiffly, "*that* would only be of interest to other rhinsceroi".

serving food, conversing (if people sit around a table), lying on it, standing on it (to whitewash the ceiling, or to change the electric bulb), constructing Lego, and on and on. Doors afford entering and leaving, marking the borders, closing the territory, blocking the way.

The concept proved inspiring for a range of human activities, and different facets of affordances have been pursued in different fields of knowledge, in accordance with the needs and preoccupations of a particular domain of knowledge, and the researchers. It is visibly and fruitfully employed in design, psychology, and aviation. For Norman (1988, 1999, 2002), the aspect of perception of affordances is crucial: "The term affordance refers to the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could be possibly used" (Norman 2002: 9). Other perception psychologists followed suit in applying the concept of affordances to the study of adaptive environments, and adaptive aids, self-motion, orientation, interactive environments, and aspects of aviation and technology (Warren and Owen 1982; Hutchby 2003; Gross et al. 2005).

Owen, an aviation expert, made full use of the psychological approach, and called attention to the perception, realization, appropriation and 'effectuation' of affordances. His lexicon of terms (Owen 2009) referring to affordances, and intended for his students, allows for easier projection of the construct of affordances to other spheres of human enquiry. In the fields of social knowing, and social interaction, Valenty and Good (1991) applied the concept of affordances to the acquisition of knowledge and behavioral competence, and emphasized the importance of revealing and creating affordances for action and interaction.

2.2 Affordances and Language Acquisition

In the field of language acquisition the concept of affordances was used by Segalowitz (2001: 15), who maintained that a language, like any other physical environment, possesses affordances, and by Van Lier (2007) with regard to action teaching and learning. These are some of the rather scarce studies involving interest in affordances in multilingualism. To date, the concept of affordances has been applied to several distinct issues in the field of multiple language acquisition. Singleton and Aronin (2007) suggested that multilingual learners have an advantage over monolinguals, since they tend to exploit the full array of their multilingual affordances in language learning. Continuing the line of research in language teaching and learning through the lens of affordances, Otwinowska-Kastelanic (2009, 2011) examined language awareness with respect to the use of cognate vocabulary in teaching English to advanced Polish students. She emphasized the connection between individual language resources, language learning and language using environments, language awareness, and positive lexical transfer from the mother tongue. A year later, Dewaele (2010) contributed to the affordances approach in language acquisition by investigating the impact of

the knowledge of other languages on self-perceived communication competence, and communications anxiety in French. The advantage of this study is in utilizing the concept of affordances as a cumulative score of typologically related languages. This allowed Dewaele to consider the combined effect of quantity and quality of specific affordances on communicative competence and communicative anxiety in FLA in French L1, L2, L3 and L4 (Dewaele 2010). In particular, Dewaele clarified the role of affordances, depending on the level of proficiency of the multilinguals. In high or low proficiency learners, the knowledge of other languages does not play a major role, but in learners with intermediate levels of proficiency, "multilingualism and affordances can serve as a crutch in challenging communication situations" (Dewaele 2010: 105).

The affordances concept is especially compatible with the ecological approach (Haugen 1972; Hornberger 2002), which renders Gibson's vision closer to the field of society, education and language. Visser (2012, 2013) capitalized on the affordances perspective when analyzing multilingual academic skills and the challenges of multilingual tertiary education at Stellenbosch University, South Africa. Counting linguistic resources in a family as affordances, a group of researchers from the university of Jäväskylä looked into informal learning contexts to discover "a complex interplay between historical, cultural, and social constraints and situational affordances" (Mäntylä et al. 2009: 71).

To advance more studies on affordances, formulations of a theoretical vision of affordances seem to be instrumental. With the aim of bringing the concept of affordances to association and alignment with multilingualism and applied linguistic studies, Aronin and Singleton (2010, 2012b) outlined the following theoretical points:

2.2.1 Affordances have been Categorized According to a Number of Criteria

Two sets of types of affordances [items (a) and (b)] were distinguished by Scarantino (2003).

(a) *Goal affordances* versus *happening affordances*. The former are those triggered by the selection of a goal, which can be marked as 'doing' rather than 'happening' (Scarantino 2003: 960). The latter, as clear from the term itself, just happen, are not triggered by specific goals, and thus are less time- and energy-consuming than goal affordances, and are more easily available. An example of this opposition could be on the one hand, goal affordances provided for the learners of Spanish at a Berlitz learning center in Prague, including teaching, teachers, and learning materials, and, on the other hand, happening affordances for acquiring Romanian in Bucharest by an infant in a family where both parents are native speakers of this language and use it daily, and it is also used in kindergartens, and in the street.

(b) *Sure-fire affordances* versus *probability affordances*. According to Scarantino, sure-fire affordances are "affordances such that manifestation follows the triggering circumstances with certainty" (2003: 959). Those may be illustrated by provision of Russian as a discipline, and as a means of instruction in Moscow, Russia. Probability affordances, on the other hand, are "such that the manifestation follows the triggering circumstances with some positive probability *p* less than 1" (Scarantino 2003: 959–960). The affordance of learning Irish in the USA can be *effectuated*, following efforts to find an opportunity, place, teacher, transportation to the class, courseware, but all this is not provided automatically in every place in the country, and thus the affordance of learning Irish in the USA is a probability affordance. As we pointed out elsewhere (Aronin and Singleton 2012b: 317–318), the more frequent success of *one person one language* parents' strategy in early bilingual acquisition, can be attributed to the fact that, in this case, sure-fire affordances of each language are provided for a child, while with other parental strategies, in which the use of a particular language is dictated by situation, topic, time, interlocutors and place, provide fewer sure-fire affordances, and more probability affordances, thus making these approaches less efficacious. We can assume then that sure-fire language affordances seem to be more promising than probability affordances for language teaching, as well as for the formulation of language policy.

(c) The division of affordances into *social* and *individual* (Good 2007; Heft 2001) may seem obvious, but this does not make it less significant. Affordances of multilingualism include *social language affordances* and *individual language affordances*. The following definitions related to these are useful: "Language affordances are affordances through the realization of which communication via a language or languages, or the acquisition of language, or languages is possible" (Aronin and Singleton 2012b: 318). *Social language affordances* are those "offered by a particular community (e.g. country, family) at a specific time, which relate to licensing the use and acquisition of language or languages" (Aronin and Singleton 2012b: 318). Finally, "[a]ffordances through the realization of which an individual can interact with, and make use of a language or languages are individual language affordances" (see more on this in Aronin and Singleton 2012b: 318).

We suggested that linguistic social affordances allow for 'opening the way' to individual linguistic affordances. Cases of feral children, and especially the case of Oxana, a Ukrainian feral child, who spent about six years with the dogs in a shed behind her house (Mcdermott 2010), seem to support this hypothesis. Living with dogs, and being deprived of human communication Oxana was denied the social language affordances. She barked like a dog, but did not speak. After her discovery by social workers and following socialization, videos and reports testify to her ability to express her thoughts using human language, and also to quite high ability of reasoning, sensitivity and emotions. In other words, when social linguistic affordances became available to Oxana, her personal affordances were picked up or 'effectuated' in Owen's (2009) terms, to her great advantage.

2.2.2 Affordances to be Successful and Workable have to Operate in Sets

In our everyday life and in teaching and learning experiences, we can find ample evidence to the fact that affordances operate in concert (Aronin and Singleton 2010). One separate affordance, or even two or three, are usually not enough to provide help or impetus for learning a language. For an endangered language to survive, an affordance of a number of living speakers is not enough. There is a need for other affordances: schools, activities allowing passing this language on to youngsters at home. Also needed are books, and groups where this language would be spoken actively in a variety of fields, such as art, and in higher education.

Often, affordances that are 'selected' for such a set to be used for a particular purpose are not the ones that are 'objectively' appropriate or more clearly perceivable. Some affordances are preferred to others due to particular restrictions. It was also suggested that each particular goal or action requires the availability of its own specific set of affordances. Exactly which, how many, and in what configuration affordances need to be present depends on the particular nature of the relevant action-goal, actor (speaker), and environment (sociolinguistic setting) (Aronin and Singleton 2012b: 322).

To take a step further and expand on how affordances 'work', I suggest the following considerations. Since *affordance*—is an abstract construct, marking a general potential for any actor in an environment, it is different from a *perceived and effectuated (realized) affordance* in the same way as a general opportunity differs from a chance really taken and benefitted from, by someone. In order for an affordance to be picked up and realized, it has to be made 'operational', activated, that is, identified and categorized for each real situation. Two conditions for successful realization of affordances are deducible from experience and studies in applied linguistics: that an affordance can be realized (effectuated) (1) only by its suitability to a particular situation, and (2) only in its relation to something or someone, a specific individual or group.

We can see an affordance only in its relation to particular people, and in a particular situation. Realizable (or, to use other term, "effectible", or taken) affordances appear in an environment, they *have to relate to something or someone*, since 'pure', unrelated, and general affordances do not exist. For example, some but not others are picked up in a family. This can be inferred from the study of Mäntylä et al. (2009). The way members of a family perceive their affordances strongly relates to how they see their needs and wishes. Affordances are perceived in accordance to their vision. In other words, for an actor to pick up an affordance, he/she consciously or unconsciously considers the available affordances in the situation, and selects the ones that he/she feels more useful for a particular task. We can further suggest that in order to choose the best affordance, leading straight to the goal, the actor has to be *involved* in the situation, action and goal-setting. Involvement can be emotional, behavioural, and/or practical. A 'good' but too general affordance will not work in an inappropriate situation. Affordances among a 'wrong' set do not work, and lose their potential. That is why, it is often the case

that some language learners succeed well, but others considerably less in the same learning situation.

An illustration of the importance of a learner's involvement in the situation, and the importance of a *set* of appropriate affordances, comes from the recent work by Singleton (2013a) on second language ultimate attainment and the age factor. In his description of a study by Kinsella (2009) we can see how affordances brought by the affective factor and involvement play a decisive role in the resultant attainment. The study involved 20 native English speakers, whose average age of significant exposure to French, their L2, was 28.6 years. After their arrival in France, all reported occasionally passing for native speakers. But only three of the twenty participants scored within native speaker ranges in all the tasks given them by researchers and these three even outperformed many of the native speakers, on the accent recognition task. It is worth remembering here that all the twenty participants had the same general affordances for advancing in their French skills. All of them had similar cognitive and learning affordances having been raised monolingually, and the age of beginning learning French after the age of 11. All of them were resident in France, in the French speaking environment at the age of about 28.6 years. Through the responses gathered from the interviews, relating to their interactions with the French community, the study revealed a number of features which distinguished these very successful participants from the rest. All three (Singleton 2013a: 32):

1) conducted their social life primarily through French;
2) identified themselves closely with the Francophone community;
3) considered it important to pass for native speakers of French;
4) had French partners.

The three most successful students, in fact, picked up more and more motivating affordances, and they were emotionally and behaviorally involved in their environment. As Singleton (2013b: 32) pointed out, "[t]he quality of the experience of encountering a new language and culture is also taken on board—and that is what makes proficiency level in the L2 importantly relevant".

In his key-note presentation (2013b) Singleton described anecdotal evidence of two groups of Irish ERASMUS students going in successive years to the same place, Grenoble, France. Group 1 consisted of two women who took separate lodgings. One of them got a job in a local restaurant; both socialized predominantly in French, and only occasionally with each other in English. Their French improved remarkably. Group 2 was a mixed group of 5 students. They took an apartment together and they socialized predominantly in English—mainly with each other. Their French did not improve. In fact, it marginally disimproved (Singleton 2013b).

It follows that, from the practical point of view, the correct, efficacious use of affordances requires employing them in a suitable situation. The implications for individuals would be that it is important to find, secure, or create an environment where the personal linguistic affordances can be deployed to best effect, amply, and even, excessively, and be supported by sure-fire social linguistic affordances.

2.2.3 Affordances are Manifested in a Variety of Ways

Because "[t]he term *affordance* represents a general category denominating a spectrum of phenomena, which from other points of view, are quite different, and may indeed seem to have nothing in common" (Aronin and Singleton 2012b: 320), the expediency of inventorying affordances in a more detailed way is clear. Inventorying affordances to identifying them in specific sociolinguistic environments for particular languages, would enable analysis, and quantification for each particular sociolinguistic case.

Affordances manifest themselves in both tangible and intangible forms. Among intangible affordances are typically human attributes: cognitive, evaluative, moral and intentional. They are among the most crucial ones, and are directly connected with language learner success. The inventory of linguistic affordances may incorporate feelings and emotions, assumptions and common knowledge, school buildings and museum objects, curricula and knowledge of languages, skills and habits, the degree of language teacher professionalism, legal provisions and events and happenings taking longer, or shorter periods of time (see more on this in Aronin and Singleton 2012b). Affordances often come as materialities, i.e. physical objects in an infinite variety of forms, sizes and shapes.

3 Material Culture as Kinds of Affordances

In the remainder of this chapter, I will deal with affordances which materialities furnish to language users and learners.

3.1 What Are Materialities and Material Culture?

Material culture is the realm of physical items, produced by humans, in the first place, things and artifacts, that we find in a huge and varied assortment in everyday life: furniture, dishes, clothing, food, utensils, pieces of art, souvenirs, weapons, medications, books, pens, carpenter's tools and buildings. Private households and collective homes, public and personal spaces necessarily contain them. Events and spaces, and constructions intended to last for a short time, or for decades and centuries, such as monuments, road networks in towns and villages, are also within the purview of material culture studies. These artifacts and landscapes, using the words of Marshall, all that "people create according to traditional, patterned, and often tacit concepts of value and utility that have been developed over time through use and experimentation are interconnected by and with local and global mentality, culture, tradition and social life", and objectively represent a group's subjective vision of custom and order (Marshall 1981: 17). Lawn and Grosvenor (2005: 7) defined material culture as the study of objects and artifacts and "the

ways that objects are given meaning, how they are used, and how they are linked into heterogeneous active networks, in which people, objects and routines are closely connected". Materialities which pervade human life from its beginning to its end, are affordances of a special kind, supplied by the history, events and industry of the society, that is, they come from the deepest core of life itself.

3.2 Material Culture of Multilingualism

A great part of material culture is what we call *language-defined objects*—that is, objects or artifacts bearing inscriptions in, or on them. The objects relevant to multilingualism are those with text, sentences, letters, hieroglyphs and various scripts inscribed or carved, and images with adjacent writings. They may contain artifacts with the inscriptions in three or two languages, or occasionally with an inscription in only one language, but within a multilingual environment (see more on this in Aronin and Ó Laoire 2012a, b; Aronin and Singleton 2012a: 168–174). An example of a language-defined object, in the Zaisan memorial to Soviet-Mongol friendship, south of the Mongolian capital of Ulaanbaatar (Ulan-Bator), shown in Fig. 1. The inscriptions on the orders of Lenin and Suhe Bator are accordingly in Russian and in Mongolian.

The earlier definition of a language-defined object "as a meaningful wholeness of material and verbal components considered as a representation of its user or users, exclusively in relation to its linguistic environment" (Aronin and Ó Laoire 2007; 2012b: 11) is updated to read as follows: A language-defined object is a meaningful wholeness of material and verbal components considered as a representation of its user or users, or sociolinguistic environment. Language- defined objects are unique affordances, because in these cases human perception of

Fig. 1 Ulan-Bator, Zaisan monument to Soviet-Mongol friendship (Retrieved from http://pavlyuk.livejournal.com/184750.html)

artifacts of multilingual material culture, blend their 'thing' properties, such as form, size, material composition and function, with the language constituent. We can assume then, that language attitudes research, multiple language teaching, and acquisition studies, would benefit from looking into these typically human affordances, in both formal and informal settings.

Although the objects relevant to multilingual investigation may have different degrees of languages actually in, or on them, their crucial property, making them instrumental for the study of multilingualism, is the *relationship of verbal and material components*. Linguistically defined objects are *not* just coincidences where the inscription happened to be on a solid surface or object. The language-defined objects exist as such only in the unity of their material and language constituents; else they would not be what they are. The main characteristic of language-defined material objects is that they are the *unity* of verbal and physical components, where the physical component supports, serves as a condition, or meaningful justification for the inscription, and the verbal part enhances, specifies and marks the physical component of the 'thing' or 'artifact'.

Language-defined artifacts often fluctuate in their exact value and meaning in time and space. Sometimes the material aspect can prevail in importance, while still retaining the verbal importance in latent form; at other times, the writing, or inscription itself is seen as the dominant component. Le Goff (2005) gives us an interesting piece of evidence in this regard. At the Carolingian court, during the reign of Louis I *the Pious, the Debonaire*, "the manuscripts became the objects of luxury, lost any utilitarian value, including the educational one. They were not so much read, as they were examined. The script reform which initiated the Carolingian miniscule[2], took into account considerations of calligraphy (…) Thus the taste of the Carolingian culture was for luxury, which was expressed in the same way as for textures of expensive fabrics, or spices" (2005: 157, translation –L.A).

In a multilingual society, material culture is a specific blend of materialities, originating from many cultures which constitute a multilingual society. This blend of materialities is, at the same time a rich pool of affordances, specific and appropriate for the multilingual environment.

3.3 Materialities of Multilingualism as Affordances

Due to the properties of material objects and artifacts, material culture is a remarkable source of perceiving, emphasizing and designing affordances for a language or languages. Some of these properties are briefly discussed below.

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[2] A small cursive script developed from uncial between the seventh and ninth centuries and used in medieval manuscripts (http://www.answers.com/topic/minuscule).

1. First of all, material objects are *solid*, "they stabilize the experience" (Schlereth 1985: 10). Being tangible, corporeal, physical and concrete, materialities have application for language teaching, as much of successful learning can happen though tangible, touchable things, texture and emotional anchors on material artifacts. Tangible affordances also play a significant role in maintaining interculturalism, multiculturalism, eco-existence, history, ethnos and negotiation of identity. Material affordances are also significant in supporting minority and endangered languages, and passing on heritage languages within a family.

2. Material objects *embody a wealth of physical and spatial qualities.* Objects have size, weight, texture, smell, and above all—inscriptions in a language, or languages which endow multiple affordances of all possible kinds.

3. Language-defined objects have *double indexicality*. In addition to the indexicality of language—the potential of language to link to the world outside itself, is coupled with the indexicality of the thing, that is, indexicality of its material, form, size, texture, etc. Therefore, artifacts and objects present themselves for investigation of any desired depth and direction. They mark tangibly and clearly the place they are in, as well as a person that actively deals with them. Artifacts indicate and sustain the nature of the person or group, thus providing multiple specific affordances. Consider computer keyboards. The keyboard of my personal computer is in three languages—Russian, Hebrew and English. I use all of them actively. In the neighbouring apartment you will find an English and Hebrew keyboard. At work, at the university or in the college where I work, Arabic/English/Hebrew keyboards are used. These details demonstrate the affordances furnished in the society for various communities, groups and individuals.

4. Material culture is known to have the feature of *affective understanding*. Many objects generate emotional and cognitive stimuli. Such objects may trigger an emotion, or soothe nostalgia, elicit pride or anger, attraction, interest or curiosity, thus acting as affordances linked to language attitudes, learning motivation and cognition.

5. Some materialities *label* a person or a community, and define them in an official or unofficial manner, and by this, modify self-perception and life. Fig. 2a, b, and c below illustrate this. Labeling of a certain kind by others, authorities, external agents, and self-labeling is an act of creating affordances.

6. One more usable quality of material objects is the fact that a special sensory knowledge is derivable from them (Schlereth 1985: 12), and the belief that physical data provide us with a certain type of knowing, "an affectivity mode of apprehension", as Prown (1980: 280) put it. As if continuing the line of this research of the 1980s, in 2012 Sarah Pink, in her *Situating everyday life* puts forward evidence from neuroscience and ethnographic research, which defies our traditional understanding that differential sensing modalities are attached to specific sense organs, hearing—to ears, vision to eyes. These developments call on researchers to observe special kinds of affordances—multisensory and embodied ways in which environments are experienced, and ways of knowing and communicating in everyday life. In light of these new developments,

Fig. 2 a Documents of multilingual in Hebrew, Russian and Komi languages [courtesy of Lednichenko (2011)]. **b** A cap *Cambridge University*. **c** Russian, Hebrew and English speaking young man in a shirt with an English inscription

material objects should be considered seriously in language teaching and learning, and appropriate affordances provided, as they allow more senses to be involved, not only hearing or seeing as in traditional language teaching.

7. Material affordances are dynamic and given to change over time in that objects themselves change, disappear and others emerge, because many material objects and artifacts are portable or perishable. The value of the same object, or kinds of objects, may change within a period of time (e.g. books in Carolingian times). Thanks to this feature, materialities create or modify the physical environment and its actors, and consequently new affordances emerge.

The qualities of material culture objects create varieties of affordances for language users and learners. For instance, artifacts might either stimulate or discourage learning and using languages; remembering one's origins, serve as mental anchors for memory and nostalgia, raise curiosity, and create an atmosphere of a foreign culture. Alternatively, they can sustain local culture, supporting the idea that a particular language is here to stay. Artifacts as emotional affordances may also relieve foreign language anxiety, as in a case of encountering a new language in surrounding enviroment. In this way one gradually gets familiar with the script, and its presence in a personal environment. Moreover, through picking up appropriate material culture affordances, speakers and learners are more socially competent, being visually prepared, by encountering authentic images of the culture. Materialities create an environment of a given time or period, to a great extent. Materialities easily lead us into the world of culture they belong to, from there to traditions, opinions, and mentalities (Aronin 2012). In short, material affordances are tangible reminders, stimulators, reality re-creators, and identity definers. Materialities carry out innumerable societal functions, and thus provide a multitude of opportunities to modify social and educational encounters.

Linguistic, social and individual affordances provided by material culture can be further subdivided into:

1) Affordances granting linguistic and cultural input;
2) Affordances providing 'anchoring' remembrance;
3) motivating affordances;
4) stabilizing affordances;
5) familiarizing affordances;
6) affective affordances.

Two major areas of the use of material affordances are *societal,* including affordances for languages used in bigger and smaller communities, families and educational affordances, and *didactic affordances* of material objects which are expected to enhance language teaching and learning.

4 Domain

Finally, the discussion of affordances and material culture necessarily invokes the concept of the *domain* of language behaviour put forward by Fishman (1965; 1972). He analysed the rationale behind the choice of language in stable bilingual settings. Fishman found out that in certain situations, the use of one language rather than another, is not accidental, but is customarily associated with specific settings, topics, and groups of interlocutors. He called such a specific setting a *domain* and defined it as "a cluster of social situations typically constrained by a common set of behaviour rules", and as a "social nexus which brings people together for a cluster of purposes" (1965: 75). The first five domains identified by Fishman are *family*, *education*, *employment*, *friendship*, and *government and administration*.

In simpler words, domains are settings where, in accordance with a specific field of experience and roles of participants, we can expect the use of a particular language with more certainty. This confident probability can be explained with the help of the affordances approach. From such a perspective, a domain is "an environment which provides a substantial number of affordances favouring a specific language or specific languages (as opposed to another or other languages), in a multilingual society. A language domain is, in fact, the space–time where the most suitable affordances in respect of a given language, or set of languages are gathered together, and therefore, a domain is the most conducive time and space for a particular kind of language speaker to use a particular language/languages" (Aronin and Singleton 2010: 121–122).

This leads us to appreciate the material culture as one of the integral parts of a domain, and the source of the affordances which constitute a domain. A domain was initially pronounced by Joshua Fishman as a sociolinguistic notion, which means that the social aspect interacting with the linguistic aspect, is the hub of attention. And social reality, as we all know, consists of non-material, and material component features. None of the domains, *family*, *education*, *employment*, *friendship*, and *government and administration* is imaginable without material

objects. Indeed, domains are loaded with affordances. It is a domain that illustrates the success of the recommendation of researchers on how to cope with the uncertainty and unreliability of the complex and inperdictable world, where each outcome is dependent on initial conditions. The requirement of *redundancy* (Bossomaier and Green 1998: 184) is confirmed to work well by the sheer existence of domains. The existence of such a space–time—domain, where a set of affordances leads to the use of the particular language(s), shows that redundancy helps. Redundancy of linguistic affordances is often manifested in material objects, confirming, supporting, helping the language to flourish in this particular setting. Extra affordances existing in a domain ensure this domain as the time-place with higher possibilities, offering ample and diverse affordances for a particular language or languages.

To illustrate it, let us consider the domain of *home*. Like other domains, its physical and spatial realm is saturated by emotions, intentions, and memories. At home the material culture physical affordances acquire 'sound' and 'voice'. A plate is an artefact that is used in most cultures of the world to eat from, to display food in front of a family member or a dear guest. Besides sheer utility, this artifact with a language inscription is used as a piece of art, an item of culture and history, both of a family and of a community. Plates made of glass or clay are popular nowadays in the tourist culture of many languages; pictures and inscriptions differ, but are also similar in what they contain Fig. 3.

Domain is one more abstract construct of sociolinguistics, which as well as the concept of affordances, allows arriving at practical decisions.

Fig. 3 A wooden souvenir from a conference in the Republic of Adygea in Russia in 1993, brought to Israel by Luisianne Hatukai (2012)

5 Conclusions

The concept of affordances in applied linguistics and multilingualism has vast potential waiting for its researchers. In this chapter, the theoretical underpinnings of 'affordances theory' were outlined as applicable to applied linguistics and multilingualism. These include categorization of affordances and fine-tuning of the requirements for linguistic affordances to be created and picked up.

Material culture is an inherent part of any multilingual environment, and materialities represent an extraordinary wealth of social and individual linguistic affordances. As types of affordances, artifacts are unique due to their concrete physical nature, and their characteristics, such as portability, three-dimensional qualities, size, form, smell, and visual specifics. The material culture affordances can be used in at least two major fields: (1) language learning and teaching, and (2) the social dimension, which includes ethnic memory, emotions, community and individual identity, language revitalization and preservation, and so on. The affordances provided by materialities are solid, portable and manipulatable. They are changeable in time, and highly specific for each particular situation.

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On Multilingual Awareness or Why the Multilingual Learner is a Specific Language Learner

Ulrike Jessner

Abstract Since interest in research on multilingualism has steadily increased over the last 15 years metalinguistic awareness has been identified as one of the key factors of language learning, in particular in third language learning. Metalinguistic awareness has been studied in disciplines such as language pedagogy, developmental psychology and linguistics. In applied linguistics in the Dynamic Model of Multilingualism (Herdina and Jessner 2002) it has been identified as the most crucial component of the M(ultilingualism)-Factor which is an emergent property of the multilingual system. Hence multilingual awareness can change in dependence on the changing system. Two school context studies at Innsbruck University have focused on the development of multilingual awareness and it was shown that multilingual awareness plays a crucial role in multilingual learning both in primary school children and in older pupils.

1 Introductory Remarks

Over the last years interest in the social and individual phenomenon of multilingualism has considerably grown. Aronin and Singleton (2008, 2012) have identified multilingualism as the new linguistic dispensation. Scholars working in the area of third language acquisition and multilingualism are interested in the exploration of the most important factors guiding the language learning process in a multilingual context. Metalinguistic awareness has been identified as one, or even *the* key factor of multilingual learning. The primary goal of this chapter is to

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look into the nature of multilingual awareness and identify it as an emergent property in multilingual learners and users, which at the same time describes it as a feature of multilingual proficiency which cannot be studied with a monolingual yardstick.

A considerable amount of work has been carried out in psychological studies of monolingual children with the aim of identifying the age of onset of metalinguistic awareness. Yet, the importance of metalinguistic awareness in the language learning process seems to increase along with a growth in intensity and amount of exposure to other languages. Therefore, the main focus of this contribution is on work going beyond the study of two languages in contact in a multilingual individual. A secondary and complementary goal is to show that a dynamic systems or complexity theory approach to language learning is a necessary prerequisite to make progress in the study of multilingualism. The chapter will start out with a description of the various research areas (meta)linguistic awareness has been studied in before continuing with the discussion of the complex nature of multilingualism and multilingual development and the crucial role multilingual awareness needs to play in a fruitful discussion.

2 Approaches to the Study of Metalinguistic Awareness

Metalinguistic awareness has been studied in various forms depending on the theoretical framework of the research, ranging from linguistics, developmental psychology and language pedagogy (Pinto et al. 1999). According to James (1999), *knowledge about language*, *language awareness* and *metalinguistic awareness* are used interchangeably although the two former are broader in scope. The several strands of research have been continued and the challenge of studying metalinguistic awareness in multilinguals has been added to the research trends more recently, as documented in the recently published *Volume 6* titled *Knowledge about language* of the *Encyclopaedia of language and education* (Cenoz and Hornberger 2008). It seems to be clear that the difference in orientedness has led to the use of different research methods and debates about methodological choices.

Metalinguistic awareness can be described as the ability to focus on linguistic form and to switch focus between form and meaning. Individuals who are metalinguistically aware are able to categorise words into parts of speech, switch focus between form, function and meaning, and explain why a word has a particular function. Consequently, the distinction between explicit learning and implicit learning is linked to the development of metalinguistic awareness (Ellis 2005).

Linguistics is interested in metalanguage only in terms of words, thereby referring exclusively to other words or classes of meaning. For instance, Jacobson (1963) included metalanguage among the secondary functions of language and referred to it as consisting in speaking of a word itself becoming its own content. In contrast, psychologists are more concerned with the processes, abilities and behaviour. Gombert (1992), whose work focuses on monolingual children, views

metalinguistic activities as a subfield of metacognition and defines metalinguistic activities as activities of reflection on language and its use as well as subjects' ability to intentionally monitor and plan their own methods of linguistic processing, both in comprehension and production (cf. Gombert 1992: 13). Karmiloff-Smith (e.g. 1992), one of the most influential scholars in the field describes the emergence of conscious access to the mind via metalinguistic abilities as a cyclical process by which information already present in the organism are made progressively available via redescriptive processes to other parts of the cognitive system.

Since differences in development are clearly related to exposure to other languages (Van Kleeck 1982), in parallel with the growing interest in bi- and multilingualism, metalinguistic awareness has been widely researched in bilingual children. Bialystok's famous work on bilingual children going back to the 1990s has been supplemented by her studies on bilingual processing in adults more recently. The study by Bialystok et al. (2004) suggests that lifelong bilingualism protects older adults from cognitive decline. A number of scholars have applied Bialystok's model of analysis and control as the metalinguistic dimensions of bilingual proficiency to investigate the impact of bilingualism on cognitive skills (e.g. Lasagabaster 1997, 1998; Modirkhamene 2008). Analysis of linguistic knowledge is described as the skill component responsible for making explicit those representations that had previously been implicit or intuitive and control of linguistic processing is the ability to selectively attend to specific aspects of a representation, particularly in misleading situations. Bialystok (e.g. 2001) concludes from her studies that there are no universal advantages for bilinguals but that high levels of proficiency in both languages lead to advantages on tasks requiring more analyzed linguistic knowledge, as also indicated by Mohanty (1994) in his study of the Kond tribal children in India. In a very recent study focusing on immersion programs, Bialystok and Barac (2012) revealed that the level of proficiency in the language of testing was related to performance on metalinguistic tasks, and performance on executive control tasks was related to length of time in the immersion program, that is a distinction was found between representational structure and executive control. From a lifespan perspective "the bilingual profile for executive control in both children and adults emerges with experience in a bilingual environment" (Bialystok and Barac 2012: 71).

For a considerable amount of time, the phenomenon of metalinguistic awareness had mainly been studied by both scholars with either a second language acquisition (SLA) or a bilingualism background. When it comes to the exploration of third language acquisition (TAL) and multilingualism (Cenoz et al. 2001a, b; Cenoz 2003) the two research areas have necessarily to be combined. Whereas in studies on metalinguistic awareness in SLA mainly grammaticality judgement tests have been used as methodological tool (e.g. Birdsong 1989), in work on bilingualism a much wider range of metalinguistic skills have been studied. Metalinguistic awareness has been linked to the cognitive advantages created through the contact with two or more languages such as communicative sensitivity, flexibility and metalinguistic awareness (see Jessner 2006). These findings have marked the history of research on bi- and multilingualism considerably. After

periods of negative and enthusiastic attitudes towards bi- and multilingualism nowadays we have arrived at a more sophisticated understanding of the complexity of the phenomenon, as described in the Dynamic Model of Multilingualism (henceforth DMM; Herdina and Jessner 2002), which applies a dynamic systems theoretical (DST) or complexity theory (CT) perspective to multilingualism. The study of TLA and trilingualism plays an important part in the exploration.

3 On the Complexity and Dynamics of Multilingualism

Over the last 15 years or so research on TLA or multilingualism has been increasingly intensified with the main goal of describing multilingual phenomena in order to investigate differences and similarities between second and third language acquisition (see e.g. Cenoz 2001a, b; De Angelis 2007). So far studies have mainly been carried out in the fields of crosslinguistic influence, the cognitive and linguistic effects of bilingualism on learning further languages, multilingual processing, child trilingualism, and teaching of third languages.

The number of possible acquisition routes increases with the number of languages learned (see Todeva and Cenoz 2009). Whereas in SLA there are only two possible orders of acquisition—the two languages are acquired either simultaneously or sequentially—in the case of TLA, we are confronted with at least four. Moreover, forms of learning are considered to play a crucial role in multilingual development. In contrast to SLA, TLA learning routes are much more diverse because very often forms of learning are of a mixed nature, that is multilingual learners study in both natural and instructed contexts.

The complexity and dynamics of multilingualism and multilingual development lend themselves to discussion within a DST/CT framework. With the support of new DST-based thinking avenues, several important issues in multilingualism have been identified. In order to be able to judge multilingual development all variables which contribute to multilingual development need to be taken into consideration, as suggested by DST. Individual factors in language learning, such as motivation, attitudes, cognitive factors (e.g. aptitude, personality traits; see e.g. Dewaele 2010), as well as physical traits of multilingual learners (e.g. hearing capabilities) also contribute to the complexity of multilingualism and research of the phenomenon. Furthermore, during the life span of a multilingual person a variety of the factors involved can be subject to change, for instance motivation to learn one language may change.

In the dynamic model of multilingualism (DMM; Herdina and Jessner 2002; Jessner 2008b), DST/CT is applied to multilingual acquisition and use. Based on DST/CT principles, the development of a multilingual system is characterized by its nonlinearity, reversibility, stability, interdependence, complexity, and change of quality. Van Geert (1994: 50) states that "a system is, by definition, a dynamic system and so we define a dynamic system as a set of variables that mutually affect each other's changes over time". A multilingual system is adaptive and dynamic,

which means that it is able to change depending on the perceived communicative needs of the multilingual individual. Language attrition, a very common phenomenon of multilingual learning, is seen as an integral part of multilingual development, thereby illustrating reversibility in dynamic systems. Therefore, in contrast to reductionist approaches to language acquisition, in DMM it is stressed that multilingual development is seen as complex, nonlinear, and variable due to its dependence on social, psychological, and individual factors.

In DMM it is argued that in the process of learning an L3 the learner develops a metasystem which is based on a bilingual norm, unlike SLA, where such a metasystem can only be based on the acquisition of the L1 and is therefore different in quality. In DST/CT terms this means that the multilingual system is considered sensitive to initial conditions, which makes its development difficult to predict. An M(ultilingualism)-effect is assumed to develop as an emergent property in a changing multilingual system. This factor consists of language-specific and non-language-specific or cognitive skills which are used in the language-learning processes, language management, and maintenance. These skills and abilities which qualitatively differ from those in a monolingual can contribute to the catalytic effects in TLA, as found in experienced language learners (Kemp 2007).

In other words, in DMM a multilingual system is an open system, dependent on a variety of factors such as social and psychological ones. Language systems within the multilingual system are seen as interdependent (rather than as autonomous) systems because their behavior depends on the behavior of previous and subsequent systems and it would therefore make little sense to look at the various systems in isolation. Evidence in support of the dynamic model comes from studies with a focus on metalinguistic awareness, such as the effect of bilingualism on further language learning (Ringbom 1987; Thomas 1988; Cenoz and Valencia 1994; Lasagabaster 1997), and the increase of ability to learn languages in parallel to the number of languages multilinguals know (Kemp 2001).

The M(ultilingualism)-factor is an emergent property, which can contribute to the catalytic or accelerating effects in TLA. The multilingual system is not only in constant change but the multilingual learner also develops certain skills and abilities that the monolingual speaker lacks. These are language-specific and non-language specific or cognitive skills used in language learning, language management, and maintenance. In particular, in the case of typologically related languages, a catalytic effect, that is a qualitative change in further language learning, has been detected in experienced language learners. What these skills and abilities have in common is their relatedness to a heightened level of metalinguistic awareness in multilingual learners and users, which can be seen as a function of the interaction between the systems. Metalinguistic knowledge or awareness of this knowledge influence further language learning or learning a second foreign language and was later on termed multilingual awareness (see Jessner 2006, 2008b).

In DMM it is argued that the multilingual system is in constant flux and that a holistic approach is a fundamental condition of a DST/CT approach. In this

perspective, emergent properties of the open multilingual system (i.e. skills and abilities developed by multilingual users which are not to be found in monolinguals) have to be focused on as does the interdependence of all parts of the system.

Such an approach not only puts emphasis on a definition of multilingual proficiency based on a holistic understanding of the diverse components of the construct, but also stresses the interrelation between socio- and psycholinguistic aspects of multilingualism. From a DST/CT perspective, the idea of nested systems contributes to an understanding of the relationship between two seemingly different approaches to the same phenomenon. In the case of language attrition in multilinguals, the interdependence between these two aspects is obvious since it is changes in environment that eventuate in changes in linguistic knowledge (typically affecting the L1 of migrant children). Language contact, more generally, as a complex phenomenon having emergent qualities, readily lends itself to being discussed from a complexity thinking perspective, as pointed out by Aronin and Singleton (2008).

4 Exploring the M-factor and the Role of Multilingual Awareness

Over the last few years the exploration of the cognitive aspects of bi- and multilingualism has become one of the major research themes. In consequence to the development of the concept of multicompetence by Cook (e.g. 2001) an increasing number of researchers have been engaged with investigations into the nature of the L2 user and her/his cognitive qualities which differ from those of a monolingual person (e.g. Pavlenko 2005). For example, Athanasopoulous (2006) focuses on the effects of grammatical representation of number on cognition or Kharkhurin (2007) concentrates on divergent thinking in bilinguals in their recent publications. But also in educational contexts particular attention has been paid to the dynamics in multilingual development (Jessner 2008a). Two of such investigations have been carried out at Innsbruck University which have investigated the nature of multilingual awareness as an emergent property.

Hofer (2013) investigated the development of meta- and crosslinguistic awareness in pupils aged 8–9 years attending a bilingual programme in South Tyrol. The aim of the study was to find out whether or what kind of influence multilingual education has on the multilingual awareness of the learners and consequently on the level of proficiency in the languages in contact, that is Italian, German and English. Data were collected in two Italian primary schools in Bolzano where two classes of the bilingual education programme (n = 40) were compared to other two classes in a traditional setting (n = 44). The research questions concerned: (a) participants' multilingual awareness and (b) the level of proficiency in each of the languages. Hence proficiency tests (reading/listening comprehension, sentence completion, etc.) were administered in all three

languages. In addition, their metalinguistic abilities were tested by using an abridged version of the MAT-2 (Pinto et al. 1999). The statistical analysis revealed that the pupils of the CLIL class significantly outperformed both control groups in all tests. This supports other studies focusing on English as a third language from other European contexts such as Spain (e.g. Lasagabaster 1998; Safont and Pilar 2005) and Finland (Ringbom 1987) which also showed the superiority of the bilingual children in further language learning. In her review of studies on third language acquisition, Cenoz (2003) stated that although in some cases no differences were found between mono- and bilingual learners in TLA, in those studies which focused on general proficiency the cognitive advantages of the bilinguals were linked to the development of communicative sensibility, flexibility and metalinguistic awareness in multilingual learning.

In a long-term study carried out in an Austrian school context the development of multilingual awareness was investigated (see also Allgäuer-Hackl and Jessner 2013). The testing population (aged 17–18) took part in a multilingual training seminar provided as a non-obligatory, additional course by two teachers of secondary school. The languages the students had learnt during their school career were English, French, Italian and Spanish. They all came from a German-speaking environment, where an Allemanic German dialect is used together with standard German as a medium of instruction. In this multilingual seminar the students get insights into how languages work, study positive transfer and interferences, get to know language learning strategies, train oral skills in the languages they learn while carrying out multilingual tasks, and develop receptive skills in further languages, e.g. through the EuroCom approach. The research questions centered on the linguistic and cognitive effects that the multilingual training has on the participants' multilingual awareness. It was found that participants significantly outperformed non-participants in tasks that require enhanced metalinguistic and cross-linguistic awareness. Furthermore, the participants profited from the training for their individual language proficiency. Positive transfer was observed in all directions (L2 on further languages, but also L4 on L3 or L2, L2 on L1, and vice versa) and participants used more languages from their repertoire as supporter languages and used them more frequently than non-participants. Additionally, the training increased the participants' awareness of language learning strategies and enhanced their motivation to improve the languages learnt and/or learn other languages. Interestingly enough, the participants also outperformed the peer group in tasks that had not been trained before, thus pointing to the emergence of new qualities in the multilingual training group.

5 Where From Here?

What can be gathered from the above is that in multilingual learners a number of emergent qualities and abilities have been evidenced. The fact that multilingual awareness is developed as a key part of multilingual learning opens various new

perspectives on language learning in general. First of all, it makes very clear that more future research is needed to investigate the relatedness of multilingualism and cognitive advantages in more detail. As pointed out by Baker (2010: 325), in bi- and multilingualism research, in particular in the educational arena, we are confronted with a chicken and egg problem. The results reported here might well be traced back to the influence of parents' attitudes towards multilingualism and the higher level of motivation in pupils who attended the multilingual training although it meant additional hours in the afternoon. In the South Tyrolean study Hofer (2013) investigated the background of the children and found that in the test groups more parents had a university degree, in particular in the test group twice as many mothers had a university degree. So we can ask ourselves which types of children gain the advantages of multilingualism? Since there is a tendency in research to use middle-class children, there is a need in research to focus now on children from underprivileged families. Furthermore, we have to look into the longitudinal perspective of multilingual awareness, that is what happens to the heightened level of metalinguistic awareness in early foreign language learners over the school years.

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Face to Face with One's Thoughts: On Thinking Multilingually

Danuta Gabryś-Barker

Abstract In her discussion of 'thinking and speaking in two languages', Pavlenko (2011) writes about autobiographic studies of immigrants as those giving evidence of assimilation processes, witnessed when immigrants for various reasons, voluntarily or otherwise, decide to leave their motherland and adapt to a new life. The degree of this adaptation or in other words integration and in the end assimilation is best reflected in their use of the target community language, not only in communication but also in their dialogues with themselves—their inner speech or more generally, when thinking. One example quoted by Pavlenko (2011) is the well-known and fascinating testimony of Hoffman (1989) of the L1 Polish attrition she observed in her private/inner speech, i.e. when thinking and talking with/to herself. In this chapter, I would like to reflect upon the language(s) of thinking of multilingual language users who learnt rather than acquired their foreign languages through formal instruction and mostly use them in less authentic environments than immigrants, in their studies or work, and not in daily communication and interaction. The research focus is on thinking in FLs: the contexts and variables that prompt language choice and activation in thinking. The analysis presented is based on the self-reflection of multilingual language users expressed in written narratives, and it is mainly qualitative in nature.

1 Introduction

Boroditsky (2009: 1) says: "Language is a uniquely human gift, central to our experience of being human. Appreciating its role in constructing our mental lives brings us one step closer to understanding the very nature of humanity". In the

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context of multilinguality, we are faced with a phenomenon in which a number of languages as reference systems, their interaction and also the statuses of each of them, create a complex network for an individual's way of functioning not only verbally in communication and interaction but also in one's thinking processes. Boroditsky reopens the discussion of the relation between languages and thinking in her studies of multilingual language users across the world. These studies carried out at Stanford University and the MIT laboratories show that "people who speak different languages do indeed think differently and that even flukes of grammar can profoundly affect how we see the world" Boroditsky (2009: 1). Other studies demonstrate that, for example, it is not only verbal expression in different languages that supports the 'thinking-for-speaking' hypothesis of Slobin (1987) but also non-verbal expression such as gestures that contribute to our understanding of how language affects thinking and language performance. For example, in a much earlier study, NcNeill and Duncan (1998: 11) concluded that "(…) speakers of different languages create language-specific modes of thinking-for-speaking. Gesture contributes material carriers to thinking-for-speaking and these take different forms in different languages".

A lot has been written about the nature of multilingualism and research in the area is fast growing. However, a number of inconsistencies concerning terminology, methodology and outcomes still persist. Here only some general characteristics of multilinguality will be presented as a brief background to the study discussed later in the text. Most of the studies of multilinguality look at the actual language performance of multilinguals. They focus on cross-linguistic consultations and the interaction of languages at the stage of linguistic processing and performance investigated by different introspective methods such as simultaneous introspection and retrospection. However, relatively little has been said so far about how multilinguals think and how they make their language choices in contexts which are subconscious and thus not controlled (or rather less-controlled) and non-didactic—in other words when they are thinking.

I would like to demonstrate in this article how multilinguals respond to the challenge of being multilingual and how it influences their inner selves and thinking patterns. I will try to see how much the hypothesis of 'thinking-for-speaking' can be detected in the narrative texts produced by my sample multilinguals and what they choose to narrate as being significant for their multilingual and personal development and well-being.

2 Theoretical Background

2.1 The Complexity of Multilinguality

A multilingual language user can be defined as somebody with "the ability to use three or more languages, either separately or in various degrees of code-mixing.

Different languages are used for different purposes, competence in each varying according to such factors as register, occupation and education" (McArthur 1992: 673, quoted in Kemp 2009: 139). Undoubtedly, multilinguality and multilingual functioning constitute complex phenomena. As de Angelis (2007) rightly states, variables that contribute and at the same time characterise different types of multilinguality and profiles of multilinguals relate first of all to the age of acquisition of each subsequent foreign language and also to the order in which they were either acquired or learnt, the proficiency level in each language that a multilingual has, their learning histories expressed by the type of instruction they received, where the distinction needs to be made between natural acquisition and formal instruction in the classroom as well as their length and intensity. Also, the actual exposure to individual languages of a multilingual and his/her use of languages and skills distribution for each of them determined by the needs and contexts of multilingual functioning play a role in his/her development of multilinguality. Additionally, a multilingual having a richer linguistic and non-linguistic reference system constantly makes cross-linguistic comparisons, be it consciously or subconsciously. This complexity of variables and their interaction in different contexts and for different purposes is very firmly grounded in affectivity, which determines the multilingual's route and rate of development (Gabryś-Barker 2012).

How multilinguals make use of their languages can be looked upon from two perspectives: that of an immigrant community member (Pavlenko 2011) and that of a language user in instructed contexts or non-native environments. In the former case, the language choices of an individual are dependent on the actual situation he/she functions in and the degree of integration or assimilation with the out-group or degree of maintenance of in-group membership. The individual's perceptions of either L1 or L2 (Ln) belonging are best reflected in their use of the target community language, not only in communication but also in their dialogue with themselves—inner speech, or, more generally, when thinking.

In the non-target case, a multilingual language learner/user makes use of his/her languages also in varied ways and configurations. In learning contexts, i.e. when performing language tasks, language choices may be more determined by controlled variables, such as for example task requirements or job demands (e.g. when teaching) than it would be in the case of less-controlled contexts of language use, such as thinking processes and also in different un-language–related contexts, e.g. in daily life routines. We may assume that thinking in a language other than the mother tongue will to a certain extent demonstrate an individual's attitude to that language and perhaps some shift in one's personality and identity, which are visibly demonstrated in explicit language performance.

The way multilinguals rely on and make choices between languages can be observed by using the different tools of introspection and by narrative texts in which multilinguals reflect upon their thinking processes explicitly.

2.2 Narratives as Data in Studying Multilingualism

2.2.1 Defining Narrative Inquiry

This article does not intend to present the theory of narrative inquiry and the use of narrative texts in research, but to demonstrate empirically how narrative texts can be used in researching one aspect of functioning of multilingual language users: multilingual thinking. Only some relevant characteristics of narrative inquiry are delineated here. Recent years have witnesses the development of narrative research across disciplines: in anthropology, psychology, education language studies and linguistics as well as most obviously in communication studies. Narrative inquiry is often interdisciplinary. It is important that narrative inquiry studies should be more visible in applied research as they offer more individualized understandings of, for example, the multilinguality phenomena than quantitative methods, despite the latter's validity, reliability and statistical significance.

It was already in 1978 when Denzin proposed what he called the *autobiographical method* of qualitative research based on various forms of narratives: diaries, biographies, letters and memoirs. The main assumptions proposed then were:

1. When researching human activity the in-depth analysis of subjective feelings, appraisals and experiences should be taken into considerations, as they are the driving motives for any activity.
2. The analysis should also consider the context in which the subject lives and functions, as it determines to a great extent his/her interpretations and ways of expressing them.
3. Every form of this type of data has value for a researcher.
4. Biographical studies of this type should be diachronic and incorporate the past in the analysis of the present.
5. This method presupposes a strong reliance on qualitative aspects of analysis, mainly based on written narratives.

There is still no full consensus on what constitutes a narrative—or rather different understandings are regularly applied in respect of it. Many favour a broader perspective than the canonical view of Labov (1972), who sees a narrative as a persona-experience discourse set in time and space. (Schifrin 2009) points not only to traditionally founded disagreements on such matters as the size and scope of a narrative but also to more ontological differences in approach to defining the qualities of narrative: should it be verbalized so based on language or on some other, e.g. semiotic process? As a type of text, narrative is assumed by Schifrin (2009: 423) to be:

> formally and functionally different from other text types such as description and argumentation. Whereas narratives are based largely on time and events, descriptions are basically additive and arguments are based largely on logical inferences.

Trahar (2011: 48) emphasizes that "narrative inquiry focuses on the meanings that people ascribe to their experiences (…) narrative inquiry concerns more than can be observed in daily practice. It also investigates the different ways in which people interpret the social world and their place within it". Thus, a narrative consists not only in what it says directly, but above all it (Jovchelovitch and Bauer 2005: 57)

> (…) lives beyond the sentences and events that form them; structurally, narratives share the characteristics of the sentence without ever being reducible to the simple sum of sentences or forming events. In the same vein, meaning is not at the end of the narrative; it permeates the whole story.

A similar view of a narrative is expressed by Rutanen (1999: 202):

> When narrating, the narrator processes the knowledge about how events proceed as well as knowledge about how these reflections can be set forth (Hudson and Shapiro 1991). The final outcome is a complex entanglement of language utilization, interpretation of social context and filtering of personal and shared experiences in culture. Imagination binds these elements together.

Thus, it can be assumed that narrative inquiry as a research data source "positions both researcher and participant as actively constituting accounts, we are able to glimpse—and sometimes more than glimpse—the larger historical, social and cultural stories within which we all dwell which inform the stories that we tell and how we tell them" (Trahar 2011: 49).

2.2.2 Narrative Data on Thinking Multilingually: Language Processing

One of the areas in which narration can serve as evidence of multilingual thinking is language processing when performing a language task, thus applying in formal instructional settings. A frequently employed tool of data elicitation is *thinking aloud* and *think-aloud protocols* (TAPs) which are transcribed thinking processes. The data can be analysed as demonstrating different levels of processing, cross-linguistic influences, affectivity, but first of all this verbalization of one's thoughts exemplifies the language choices made by a language learner/user simultaneously with processing the language of the learning task. This verbalization is to a certain extent explicit manifestation of both controlled and automatic processing. It is also a kind of monologue or dialogue with oneself in the mother tongue or any other language known to the multilingual. We verbalize our thinking and our thoughts not only when we find ourselves in learning contexts, but also privately.

In my own study of language choices made when thinking and verbalizing, it turned out that in the case of different multilinguals, preferences differed depending on the types of comments that were made when performing two translation tasks. In that case, they were strictly learning tasks (Gabryś-Barker 2005). The difference between the two tasks was in the language of the input texts. In task 1 the input was in L1 and in task 2 in L2, and both of the input texts were to be translated into L3. The study looked at different aspects of language processing

Table 1 Language choices in different types of comment (based on Gabryś-Barker 2005)

Language	Types of comment
L1 (Portuguese, mother tongue)	• Activated for affective comments in both tasks • Activated for cognitive comments in the L1 input task
L2 (English, advanced)	• Activated predominantly for affective comments and expressing positive aspects of one's performance • Activated for cognitive comments in the L2 input task only
L3 (German, elementary/ pre-intermediate	• Activated for all types of comment in both tasks where the focus was on the target language itself and on task performance

in multilinguals. Here reporting on that study, I choose to present the findings concerning just one aspect of the analysis performed, namely the languages of thoughts, which is the focus of this article (Table 1).

The observation of introspective comments in the form of TAPs led me to conclude that the activation of L1 for affective comments in both tasks occurred because the mother tongue is the intimate language of affect/emotion. At the same time, L1 activation in cognitive comments on the L1 input task was chosen because of greater fluency in L1 than in L2 or L3, which facilitated explicit verbalizations. The choice of the first foreign language (L2 advanced English), mainly in affective comments, expressed positive aspects of one's performance, which may be assumed to have been a facilitative factor in praising oneself, as L2 is a distancing language (unlike the intimacy of L1). The choice of L2 for cognitive comments in the L2 input task derives from learning strategies of text manipulation. L2 was dormant in the L1 input task as L1, being an acquired language and not learnt, did not activate consciously strategies of text manipulation. The L3 used in all types of comments and in both tasks demonstrated the greatest variety and/or activation—especially in the context of another learnt language, L2 demonstrating transfer of learning from L2 to L3. The data showed the different statuses that L1, L2 and L3 hold in the multiliguals' mind.

2.2.3 Narrative Data on Thinking Multilingually: Affectivity

One important aspect that narrative inquiry can give evidence of is the affective dimension of one's functioning. Emotions, being primary to cognition, filter experiences and how we feel about them and, as a consequence of this feeling, interpret them. Thus, when studying narratives, emotionality is integral to their understanding: "without assimilating emotions to a narrative line and attributing them to characters (our own or other people's) they remain almost meaningless: gusts of neural activity causing little tempests of experience" (Oatley 2004: 99). Following the classic assumptions made by cognitive emotion research (Tomkins 1979; Frijda 1987), Oatley emphasizes that emotions are embedded in scripts, which means that they are "processes which have a structure not unlike the narrative schema proposed, in which a principal property of emotions is motivational: emotions are tendencies toward action" (Oatley 2004: 99).

The study of multlinguals' emotion-related issues is a growing area of research, making use of narrative texts in the form of autobiographical memories and narrative texts, most notably studies of such researchers as Pavlenko (2001, 2005, 2006), Schrauf and Durazo-Arvizu (2006), and Besemeres (2002, 2006). Besemeres (2006: 55) sees the value of research into emotional experience and language by means of narratives in the fact that it is not meant to answer questions posed in advance but relates directly to experiences expressed in a narrative form:

> (…) research into the emotional dimension of bilingual life narratives necessarily engages with themes and questions arising from the narratives themselves. By their very nature, each of these texts reflects on aspects of emotional experience differently.

Narrative stories are unpredictable and draw our attention to the richness, uniqueness and individual variations observed in being bi- or multilingual. Table 2 presents sample studies of emotion-related narratives starting with the pioneering work of Hoffman (1989), a Polish immigrant and writer, writing in English and emphasizing the role of language in one's perception of oneself and one's shifts in identity.

The contexts of the above sample of studies comprise reports on immigrants who became multilinguals through adapting to new language and culture environments. They are either first-person narratives or analyses of others, usually well-known characters, in the form of autobiographical memories of multilingual writers such as Eva Hoffman or Jerzy Kosiński.

Table 2 Narrative studies on bi- and multilingual emotionality

Theme	Context	Author
Culture-grounded concepts, relations between language, emotion and its expression	*Lost in translation*: *A life in a new language* (1989)	Eva Hoffman
Anglo-American cultures versus Asian-American cultures (the concept of silence)	*Articulate silences* (1993)	King-Kok Cheung
Emotions as triggers of language learning behaviour	"On language memoir" (an essay) (1994)	Alice Kaplan
	"Bilingualism and emotion in the autobiographical works of Nancy Huston" (an article) (1994)	Caleste Kinginger
Language learning experiences and their emotional dimensions	*French lessons* (1993)	Alice Kaplan
Experience of self in autobiographical memory	*Emotions and multilingualism* (2005)	Aneta Pavlenko
Culture-grounded concepts and their un- translatability (writers' narrative reflections)	*Language and emotional experience* (2004)	Mary Besemeres
Emotional experiences of Japanese immigrant women in Australia	*A passion for English*: *desire and the language market* (2006)	Ingrid Piller, Kimie Takahashi

3 A Pilot Study on Multilingual Thinking

3.1 Description of the Study

This pilot project is set in a context where languages other than L1 are formally learnt and—unlike in the above studies—are used mostly in the domain of studying and work and more precisely teaching, as the subjects involved in the study are pre-service and novice teachers of English. The focus of the study is on investigating language choices made by multilinguals in their thinking processes, the contexts in which these different choices are made and the variables that prompt language choices in thinking. The analysis presented is based on the self-reflection of multilingual language learners/users expressed in written narratives and it is mainly qualitative in nature.

The earlier mentioned controversies concerning narratives as texts—one about the length of a narrative (should it be a full text or does a clause constitute a narrative?) and another which relates to its verbalization: whether it is to be verbalized at all and if so, what form this verbalization takes as the basis for analysis. These are essential decisions determining what the data is to demonstrate. The narrative framework adopted presupposes the research instruments that can be employed. I would like to suggest that in researching multilinguality, both the study of inner/private speech in the form of simultaneous introspection (oral narrative as described earlier in Sect. 2.2.1.), as well as retrospective reflections in the form of narratives (written texts), can inform research on language processing itself, the cognitive and affective aspects of learning experiences as occurring on the spot and in retrospect. Both of these tools allow us to comment on individually determined characteristics of language learning/use which in the context of multiplicity of variables, their intensity and degree of interaction do not straightforwardly bring up statistically valid findings, but mostly point up certain tendencies and most of all, individual variation in multilinguals.

This pilot study was carried out on a group of 26 multilingual language learners/users at a Polish university, who were all proficient (C1/C2) users of English L2 and pre-intermediate (A2/B1) learners of L3 (mostly German). The focus of the study was on the language(s) of thinking. The subjects were asked to write a short reflective narrative text of 300 words on the topic *Language(s) of our thoughts*. The context was not specified, which allowed the subjects to comment freely both on their language activation in learning contexts and beyond in their daily lives.

As a narrative inquiry, the study was of a qualitative type and the procedures involved consisted firstly in establishing the categories of analysis (Mayring 2000), i.e. pre-determined deductive categories, and then inductive categories which were singled out from the narratives. Table 3 demonstrates the outline framework for the model of qualitative content analysis (QCA) according to Mayring (2000).

At the outset, the following deductive categories of analysis were established:

Table 3 Categories of analysis in qualitative content analysis (QCA)

Category type		Source	Sequence	Practice
Deductive	Pre-existing categories	Theory	1. Research question.	Defining; categories
			2. Categories pre-defined by the theory	Examples in the text;
			3. Application to the text	Coding
Inductive	Research question	Input data	1. Research question	• Examining texts;
			2. Narrative text	• Selecting reoccurring categories;
			3. Category formulation	• Refining them;
			4. Category definition	• Text examples to illustrate categories;
			5. Refinement in the course of analysis	• Defining categories;
			6. Application to the text (a feedback loop)	• Coding

- a choice of languages activated in thinking processes;
- frequency of activation of different languages in thinking;
- a context of activation.

After initial analysis of the narrative texts collected, the following inductive categories were elicited and later on refined:

- language proficiency as a factor in activation;
- reasons for language choice/activation:

  - linguistic: high level of language proficiency, perceived language economy, code switching, and communication with NS and speakers of other languages;
  - non-linguistic: exposure and immersion (media, music, film, studies and work), and the affective dimension (attitude to a language, confidence in one's ability, emotional states).

3.2 Data Presentation and Analysis

3.2.1 Quantitative Data

Quantitative data elicited from the narrative texts shows, as expected, the dominance of L1 as a natural vehicle of thoughts and thinking processes; however, in the case of these subjects whose L2 competence is high, it turned out that they also automatically activate their first foreign language (L2) when thinking. Furthermore, 90 % of the subjects admit to thinking in English *often*. At the same time, L3 is activated by 30 % of the subjects and with different levels of frequency, *seldom* being the most frequent answer (60 %). One third of the respondents admit to never thinking in L3.

Table 4 Language(s) of our thoughts (study data)

Deductive categories	Data	Inductive categories
Language choice/activation:	L1: 100 % L2: 90 % L3: 30 %	Proficiency level: L1: mother tongue L2: C1/C2 L3: B1/B2
Context of activation (when):	L1: daily routine, life situations, praying, emotional states L2: at university (classes and beyond), at school (work), during leisure activities (music, films), holidays abroad L3: during classes, visiting L3 country (e.g. Germany), leisure (occasionally: film and music)	Reasons for language choice/activation: • Language proficiency • Context (studies, work, life) • Attitude to language(s) • Confidence • Emotional statesLinguistic (language economy, code switching) • Communicating with speakers of other languages
Frequency of activation: (always, often, seldom, never)—percentage of subjects	L1: Always: 100 % L2: Often 100 % L3: Often: 6 % Seldom 60 % Never 34 %	

The contexts in which each language is activated when thinking indicate that it is natural to think in one's L1 in daily life, about things happening at the moment and also in emotional terms, where L1 is at the heart of one's feelings. L2 is treated as the tool for studying and in some cases a tool in one's job (teaching at school). Additionally, L2 becomes a language of one's thinking in the domain of relaxation and entertainment, when immersion in music, film or some other form of cultural activity is performed in L2 as if it calls for activation of this very language as a better means of understanding the message or identifying with the context. At the same time, L3 as the language in which the subjects have less competence, when activated, appears almost solely in study situations and again, only at the time of immediate exposure to the language (for example during classes). Unlike L2, it never becomes a tool for expressing emotional states. Table 4 shows the quantitative results of the narrative data on the language choices of the multilingual subjects.

As mentioned earlier, these results are hardly surprising and confirm what is generally believed, namely that the level of language competence affects its conscious use and subconscious and automatic activation in thinking. However, narratives as a source of data offer much more than pure quantitative and 'factual' (objective) data. They allow us to analyse in-depth these multilinguals' perceptions of their multilinguality in its various dimensions: cognitive, affective and social. They point to what the multilinguals see as important and what they choose

to ignore when commenting on their thinking processes, and language activation in these processes. They also demonstrate their understanding what it means to be multilingual and how much they are capable of reflecting upon this phenomenon. The following excerpts illustrate how the variables elicited as deductive and inductive categories affect language activation in multilinguals' thinking.

3.2.2 Qualitative Data: Narrative Samples

Most of the subjects associate activation of FLs in their thinking processes with their competence levels and see a direct connection between success in learning tasks and the ability to think in the language of the task, as indeed facilitating language performance in this language:

> I believe that thinking in other languages is a natural process which starts happening to people who obtain a certain level of proficiency. It is easier to think in L2 or L3 while speaking or writing than to think in L1 and translate our thoughts. (…). I am sure that studies and issues connected to that certainly make me think in English. However, that is not the only cause. In my free time when I devote some time to entertainment I also exercise my mind in English. (…). English is definitely in my mind, and it influences me and the way I think (S 13).

The role of exposure to a given language is expressed in the first excerpt which reports on how the subject switches her language from L1 into L2 when immersed in the cultural experience of reading, listening or watching a film in its original version. The excerpt also points to the attitude towards and the feeling of dislike for the other language (L3), as deterring her from thinking in it:

> I happen to think in other languages i.e. English whenever I am exposed to it, e.g. when meeting foreigners or native speakers of English, while watching films or TV series without subtitles and when reading books in original. (…). As I am a day-dreamer, I often daydream in English. Sometimes in Spanish, too. It depends where the story is set. I never think or dream in German, though. I just don't like the sound of it (S 5).

A similar reflection is expressed by the next subject, who additionally seems to extend the role of her L2 learning experience to situations of Sunday church-going and praying, where she as if performs a language task when listening to the priest:

> Speaking is strictly connected with thinking so when I am in an English-speaking environment I usually think in this language. (…). Apart from the university there are also many other occasions when my language of thoughts is not Polish. For instance, listening to foreign music or watching foreign films. If I do it, I concentrate on the language that I hear and sometimes I even analyse the action in L2 in my mind. (…) My thoughts are different and its languages are mixed. (…). Also rarely but yet, when I am at church I subconsciously translate into English what the priest says (S 7).

The choice of language(s) of thought is not only determined by the context but also by the topic and subject matter of one's thoughts. The following comment shows that language and culture are perceived by the subject as closely related.

Also thinking in a foreign language is seen here as a particularly effective strategy for learning this language:

> In my opinion, language of our thoughts depends on the topic we think about. When I consider cultural aspects of a foreign country I try to think in the language of this country. Therefore, while talking or writing about traditional dishes of England, I think in English. I don't know hwy this situation is happening. Maybe while talking about this country I want to identify with people living there (…). Moreover there are situations in which I cannot express my thoughts or feelings in Polish. instead of Polish words I think about English or German words. (…). Thinking in a second language helps us while learning this language (S 8).

Similarly, the narrative below comments on how the subject influences the language of thoughts. It also shows a certain language continuum on which the thinking processes develop and languages get mixed in the process of code switching. The initial stages of the subject's period of studies represent more intensive activation of L2 in her thinking, which we can assume was caused again, by the perception of thinking in a foreign language as an effective learning strategy at that time. The comments relating to L3 are a very convincing example of how negative affectivity makes L3 activation absent from the thinking process:

> The language I think in depends mostly on the subject of my thoughts. If it is connected with the subjects at the university or with the terms I use much more often or exclusively in English. (…) On other occasions I produce a kind of mixture of Polish and English in my head. (…). I remember that thinking in English was much more common for me in the first year of studying it. At that time I was always thinking in English about what had happened to me while I was going home after classes. After the first year everything started to calm down. (…) I never think in German. Perhaps it is because I don't know this language so well or maybe the most important issue here is that I don't like it. I don't like the sound of this language and usually I am not so fond of German teachers. I was somehow forced to learn it even here and I guess because of that I have never thought a sentence in German (S 23).

Another subject emphasizes that code switching in her mind is a conscious process of translation and represents what we might term a rehearsal before the actual language performance. Under stress this rehearsal is inhibited:

> (…) I think in a foreign language quite often. It depends on the country I am actually in. it happens very often that I think in English about what I want to say. The process of translation from Polish to English in my mind doesn't take much time. This is kind of routine (…) However, when I have to talk in English and think about what I am going to say and this is a part of the exam, I find it difficult to think in English. (…).Therefore, the language I use to think is related to attitude and emotions as well as situation and people we have to deal with (S 6).

The next subject was brought up in a half-German family and also had a chance to spend some time in Germany as an adolescent. This is how she reports on her thinking processes in her L2 (German) at that time and later on when learning L3 (English). The text shows that the subject identifies herself more with L2 than L3 in this case, which may be explained by the fact that it is the language of her childhood upbringing:

Language of our thoughts may differ from the language we communicate in. (students' exchange in Frankfurt, junior high school). There, I realized that after 2 or 3 days I started to think in German before going to sleep. It was quite strange because I began one thought in Polish but ended it in a different language. What is more, I liked the fact that I thought in L2 as I perceived it as L2 progress. (…) When it comes to English, I switch the language of my thoughts during classes when I am engaged in the topic. If there is something that really strikes me I think about it in L3. (….). When I watch some English movies or series and I am fully engaged in the plot (…) I am asking myself questions about what happens next (S 1).

An interesting perspective is taken on language choices in thinking in relation to the mother tongue of the subject. This comment demonstrates how both L2 and L3 can contribute to thinking in L1:

The L2 and L3 influenced the awareness of formulating my thoughts in L1 in terms of grammar, syntax or pronunciation (S 21).

Another subject refers to thinking-for-speaking, where the language in which we are to express ourselves determines the language in which we think; in other words we rehearse when thinking, confirming the hypothesis of thinking-for-speaking, which can occur when the language level is adequate to the task (here: German is not):

I often think in English. For instance, when writing this text it is easier to think in English than in Polish. I switch languages when thinking very often. It happens that I start my thought in English and finish it in Polish, or the other way round. (…). I do not think in German. Sometimes after some hours spent on learning German, my head is full of German words, but it is not thinking. While talking in one language I also think in that language, not in the case of German—when I speak German, I usually think in Polish (S 22).

Thanks to steady exposure and functioning in contexts in which a foreign language becomes a tool of communication in executing tasks, it may become so intensive that, as shown here, it enters subconscious states such as those of dreaming. In the case of stress and emotions, most predictably we proceed with our thoughts in L1:

It is funny but when I was writing my thesis I used to have dreams in English. I think it was the effect of reading, writing and speaking in English more often than usually. (…) I think in Polish most of the time but when there is a situation when I am exposed to another language, I am more likely to use single foreign words in my thoughts. There are exceptions because when I am in a stressful situation I always start thinking in Polish (S 3).

Inhibition at performing orally in a foreign language results from various barriers, not just the linguistic but also psychological ones which a FL speaker may experience. Here is an interesting example of a subject who compensates for this inability by actually speaking in L2 to herself when thinking. She expresses a positive attitude to L2 (but not L3) and perceives thinking in this language as a learning experience, in which she can safely experiment with the language and not be ridiculed by her interlocutors as a consequence of imperfect language performance:

I prefer to speak in my mind in English rather than in front of people because it is very stressful. (…). I have noticed that it is better for me to think in English and speak to myself rather than to speak in front of the whole group. (…). I believe that using foreign languages during the process of thinking strongly depends on our humour. (…). I love to speak to myself in English even if I make mistakes, because other languages like German are for me not so positive. English is perfect because I can play with this language and discover new things on my own (S 2).

The focus on the emotional dimension of language choices in thinking is clearly visible in the next quotation, in which a very negative emotionality is expressed in relation to L3:

I think in Polish when my thoughts relate to emotions. When I am in a situation when English is required I switch into English very fast. The same situation occurs when I watch films in English. I am not even aware that my thinking switched into English. When it comes to German, I hope that it will enter my thoughts soon (S 4).

However, this negative attitude to L3 reported on in the previous narratives changes when intensive exposure to L3 becomes a decisive factor in activating it in one's thinking processes:

This process is often unconscious. I think that the more people are exposed to a foreign language the greater possibilities they have to think in this language. Moreover, thinking in a different language helps to gain better fluency. (…). This process was really helpful to me during my stay in Austria. I felt more comfortable and confident, so I perceived myself as a better German speaker (S 9).

Intensive instruction and exposure to a foreign language, for example as a part of one's studies, has a profound impact not only on thinking processes and also the ease with which L2 enters thinking, but it may also have a negative effect on L1 and cause its attrition on different levels (lexis, syntax). Functioning in a naturalistic L2 context reinforces integrative motivations and behaviours which may result in a sort of split perception of one's personality/identity. In this narrative, L3 (French)—unlike in the previous texts reporting on L3 German—is seen as a language of emotions, as the subject herself says:

As an English language student I am forced to use this language all the time (…). I noticed I have been also thinking in English. That usually occurs during my free time, while reading or shopping. Generally in common everyday situations. In my mind I try translating all the structures, phrases into English, but I speak Polish. It sometimes happens to me that I know an English word but I cannot recall its Polish equivalent. (…) Since I have been learning English at the university, I noticed a huge regress in my usage of Polish language. What is more, during my 3 months' visit to England a few years ago, I behaved more like English than Polish. I adapted to this culture and weird customs very quickly. Only my Polish accent indicated that I was Polish. it was very difficult to come back to Poland. (French) I cannot admit that I can think in this language. But on the other hand, I really like to listen to French native speakers. (…). Sometimes when I think of feelings, emotions and love- French comes to my mind immediately. "Je tàime" sounds very romantic (S 20).

Similar views are put forward in the following narrative:

> (a visit to a friend in England as a teenager) After a few days of my stay I realised that I was no longer in a familiar sounding environment (…). At that time I started to think in English. This experience influenced me to such an extent that I kept thinking in English after I came back to Poland. Today I think in English everyday—not only during classes at the university but also at home when performing daily-routine activities. I have also noticed that I have problems with talking to my family and friends in Polish. There are words which perfectly express the things I want to talk about but they happen tot be in English. (fascination with language = thinking in the language, early start at 5 at home, friends) (S 18).

A strong integrative aspect expressed in the next narrative shows that not only in a naturalistic setting but also when living in a non-target language country can language development be an effective learning experience resulting in a natural L2 use:

> I use English so often that it has become very natural for me, that is why I think in English often when I am alone or when I sit on a bus. I often note down something in English, not in Polish. Many folders on my computer are in English. (…). There are situations when English words express some feelings, states, notions better than Polish. (…) Every time I write a composition such as a paragraph or an essay, I think in English. When I do not know a word in English, I do not switch into Polish but rather search for a different word or provide a description (unlike German when I directly switch into Polish) (S 12).

One of the subjects believes that thinking in a FL helps in learning it; thus she even advocates a total ban of L1 from language classrooms and makes teachers responsible for the amount of exposure to a FL, which learners in such a situation will adopt as the language of their thoughts:

> What is more the teacher should care about what language is used during the lesson. It is really helpful when the teacher bans the use of l1. Then we are forced to think and find L2 words. And again according to my experience, English words come to my mind and I make sentences (in L2) (S 11).

The subconscious use of L2 (seldom L3 in the case of this study), extends from thinking to dreaming. What is even more significant, it seems that this additional 'exposure' and use of L2 function as facilitative factors in actual language development, contributing to the positive affectivity of a learner/user in terms of more confidence, higher self-esteem and positive perceptions of one's coping potential:

> What I have actually noticed recently is the fact that after watching a couple of TV series in English I start to think in this language immediately. And these thoughts concern not only some casual things or duties to be done but also the values which appear to be significant in my life and which entails certain issues and hesitations. What also happens to me quite frequently is dreaming in English. I mean when sleeping. I communicate with other people, both familiar and strangers. I really love such dreams—I feel more confident when speaking English then, and what goes with it, I become much more fluent and native-like. In my opinion thinking and dreaming in a FL do have a lot in common with human subconsciousness. Namely, when one has a great desire to acquire a FL perfectly, such dreams or thoughts may occur in their minds as a result of this subconscious yearning (S 17).

One of the most significant influences that development of competence in multiple languages has is its effect on one's personality, the perception of one's identity and ways of behaviour. In spite of this, it is always L1 that will be more prominently and naturally activated in certain contexts. This view is expressed in the narrative below:

> There is a belief that a FL gives a speaker a new personality. It can make people more open, confident or even more sociable. I experience such changes when I speak or think in German, because I become more reasonable and strict. On the contrary, English gives me eloquence, freedom of speech as well as an easy manner. Nevertheless, there are still spheres which involve only native language usage. Still, prayers, strong emotions or bad mood evoke the first language (S 30).

What do these individual comments made by multilingual language learners who are also language users and teachers tell us about the language choices they make when thinking and the factors that bring these choices about?

3.3 Observations and Findings

The data collected from the narrative texts written by the subjects clearly demonstrates that exposure to a given language is the main determinant of its not only conscious but also subconscious use in one's thinking processes, irrespective of the context. There is a unanimous agreement in the data that exposure to and immersion in language in the target community, as well as its culture when functioning in one's L1 context (reading a book, watching a movie), will strongly promote uncontrolled activation of that language when thinking. A similar role is assigned to intensive exposure through instruction, for example in a classroom setting, to a foreign language, which may lead to multilingual thinking not only in this formal context of the classroom/university but also beyond, for example thinking on the bus or when shopping, that is during natural daily activities.

When exposure occurs in the target language country, it leads to multilingual thinking as a significant part of the integrative process with that culture (and people) and not just language development. It was observed by the subjects that it affects one's identity and definitely can cause personality change when switching languages, which is seen as a subconscious process. In the non-target context and in instructional settings such as school or university, multilingual thinking occurs as a facilitative dimension of expressing culture-grounded or related thoughts. What is more, multilingual thinking or thinking in languages other than L1 expresses the values of the language(s) activated in thinking and affects one's behavioural patterns.

It is not only exposure and its different forms and the contexts of its occurrence that contribute to multilingual thinking. It is also facilitated by the choice of the topic of one's thoughts. On the one hand, certain topics will be more typical in encouraging interlocutors (and also in dialogue with oneself) to use a given

language more than one's L1, e.g. when discussing study topics. Thus, there will be a visible transfer of language in which performance happens to language one thinks in as if rehearsing for this performance. Additionally, the specificity of some concepts and their cultural grounding makes it natural to think in that language rather than search for (near) synonymous concepts in one's L1. It is as if to say that language belongs to its culture and thus expresses this culture best.

Exposure and the forms it takes, as well as the topic of thinking, are variables that are fairly controllable, whereas the affective dimension of language activation may not be. A very positive or negative attitude to a language, a strong liking or dislike for a language—mostly in relation to its sound—are perceived by the subjects as either facilitative (the former) or inhibiting (the latter) of the process of language choice and its activation in thinking. In other words, positive affectivity stimulates language activation in thinking, and leads to more self-confidence, positive perception of oneself and the ability to perform better in a given language. At the same time, negative affectivity results in withdrawal and less multilingual activation when thinking and thus less confidence in speaking.

The subjects strongly emphasize the role multilingual thinking exerts on multilingual speaking, as the former is seen to be a form of rehearsal for speaking—the 'thinking-for-speaking hypothesis' (Slobin 1987). The language(s) of one's thoughts also testify to the status of a given language; the more intimate the language is perceived to be, the more actively it is used in thinking. However, leaving aside all these other factors, it is L1 that is the dominant language in thinking. It was interesting to see that multilingual thinking may not only express positive affectivity and attitudes to a language being activated but it additionally serves as an instrument of interaction in a foreign language in the form of a dialogue with oneself, when performance in front of a bigger group seems to be impossible because of one's inhibitions and the barrier these inhibitions put up to more regular interaction.

The subjects of the study being multilinguals (and thus experienced language learners) see the value of multilingual thinking as an effective learning strategy, increasing both exposure to a learnt language but also its active use in dialogue with oneself, which goes beyond the learning experience as it is transferred to daily life. For example, the subjects mention the contexts in which they think multilingually by translating the text heard in L1 into another language: when watching a film or listening to a sermon in the church. Such a practice is believed to add to language fluency. Often this multilingual thinking starts with language mixing or code-switching.

Thinking multilingually is seen not only as a learning strategy but also as evidence of a high level of language competence that leads to language success. This language success is multidimensional. It not only offers rehearsal for performance in a foreign language but also has an impact on L1 awareness and on performance itself. This ability in multilingual thinking influences L1 in two ways:

- positive influence—it helps formulating thoughts in L1 (one's awareness of other languages) and enhances development of language sensitivity;
- negative influence—L1 backsliding and code switching are observed when activation of a foreign language inhibits automatic lexical search retrieval in L1.

4 Conclusions

Each of the above observations based on the testimony of multilingual language learners and users can be interpreted as offering some guidance for formal instructional settings and ways of promoting multilingual thinking as facilitating not only language development in L1, L2 and L3, but also contributing to personal development and growth in terms of one's self-confidence and positive affectivity in general. As was seen, emphasis needs to be laid on both extensive and intensive exposure to different languages in and beyond the instructional setting. In the classroom context, it means that, whenever feasible, the elimination of L1 and the use of a FL as the language of instruction (teacher talk) should be promoted, not only in on-task activities but also in off-task communication. Making multilingual learners aware of how they learn, more attention should be paid not only to language performance but also to thinking processes, which, as mentioned earlier, should facilitate one's language development and the use of learning strategies. As I mentioned elsewhere (Gabryś-Barker 2012a),

> (…) awareness of verbal aspects of one's thinking processes and IS (inner speech) as a type of problem-solving strategy in language rehearsal and performance are significant for L2/Ln learners/users as tools for more conscious facilitation and at the same time for monitoring language learning progress.

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Crosslinguistic Influence in Instructed L3 Child Phonological Acquisition

Romana Kopečková

Abstract The study of third language acquisition provides an unparalleled opportunity to gain greater insights into the role that previous linguistic knowledge plays in the acquisition process of subsequently acquired linguistic systems. While the past decade of enquiry in this area has seen much progress in regard to our understanding of how lexical and morpho-syntactic systems interact in the multilingual mind, empirical research into third language (L3) phonology has been much slower to appear, and what exists is oriented towards investigations of crosslinguistic influence (CLI) in adult L3 phonological acquisition. The present study aims to add to the emerging field of L3 phonology by reporting the results of an ongoing research project investigating, *inter alia*, possible sources of and conditioning factors for CLI in L3 segmental acquisition of instructed child learners. The child participants were 20 native speakers of German starting their 1st year of Spanish after 3 years' instruction in English. The analyses of the child L3 learners' productions of rhotic sounds in all their languages offer evidence of a range of CLI phenomena, with one of the more prominent factors at play being the intrinsic difficulty of the target phonetic feature.

1 Introduction

There is a growing recognition that the study of third language (L3 henceforth) acquisition can offer some valuable insights into the processes involved in non-native language acquisition and speech production in general. The opportunity to

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contextualize and thus better understand the role that previously acquired linguistic knowledge plays in the acquisition of subsequently learnt linguistic systems becomes readily available in the case of sequential multilingualism. The key issue that remains to be determined, however, relates to the specific interplay between the two previously acquired linguistic systems with the target language and the factors that conspire to condition such an interaction.

When it comes to the acquisition of L3 phonology, the findings of the few extant studies in the area suggest that both the L1 and the L2 sound systems can affect L3 speech production, depending on a range of factors which can converge and interact to either increase or decrease the likelihood of transfer[1]. The main factors identified to date include L1/L2 status (e.g. Llama et al. 2010), typological distance (e.g. Wrembel 2012), L2 proficiency (e.g. Gut 2010), and task-related variability (e.g. Wunder 2012). Considering the complexity of multilingual experience (for a recent review, see Aronin and Singleton 2012), there may be additional variables operative in (CLI). For instance, age-related differences in the acquisition of L3 phonology have rarely been addressed in the current research in the area. Indeed, the general observation that L1 sound system is favored for transfer during L3 phonological acquisition may be related to the fact that previous studies have mostly been conducted with adult L3 learners, who are likely to have extensive experience with learning and producing their L1, and thus may be more prone to L1 transfer effects. On this view, the L1 sound system of child L3 learners may be a weaker 'attractor' of L3 sounds and play a lesser role in their L3 phonological acquisition (cf. Flege 1995; for an extensive review of alternative accounts for 'age effects' in non-native language acquisition, see Singleton and Ryan 2004).

The aim of the present study is therefore to contribute to this line of linguistic enquiry by examining CLI in the initial state of L3 segmental acquisition by instructed child learners. Based on previous research into phonological transfer in L3 acquisition reviewed in greater detail below, the assumption adopted in the present study is that the initial state of L3 phonological acquisition is not fated to L1 transfer alone, but rather that it represents a multi-causal phenomenon affected by many interacting factors (Hammarberg and Hammarberg 1993; Hufeisen 2010).

2 The Complexity of Crosslinguistic Influence in L3 Phonological Acquisition

It can be assumed that CLI will be more complex when three or more sound systems are in contact rather than two. Earlier investigations of transfer in L3 phonology do not seem to provide much support for this assumption though. For example, Ringbom (1987) observed that L1 transfer effects are dominant in L3

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[1] The terms *crosslinguistic influence* and *transfer* are used interchangeably in this study.

speech production, especially when it comes to intonation and the early stages of L3 learning. He went on to claim that L2 transfer is rare in this domain, and if present at all, it is conditioned by the learner's perception of similarity between the L2 and the L3 and the recency of L2 use and/or intensity. Llisteri and Poch-Olivé (1987) support this observation; their results from an experimental study showed that Catalan-Spanish bilinguals—not unlike their monolingual Catalan counterparts—followed the acoustic features of their L1 in the production of L3 French vowels and consonants. Considering that French and Catalan are closely related languages, the factor of typology may have had a bearing on the documented type of transfer here, however. González Ardeo (2001) also explained most of the pronunciation problems experienced by Basque-Spanish bilinguals in a reading test in L3 English by reference to the phonological properties of their L1. Most recently, Wrembel (2012) offered evidence of a dominant L1 influence in L3 English in an accent rating study, where the majority of the study participants were correctly identified as being Polish native speakers despite their dominance in L2 French. Comparing the results to her previous work, she concluded that in the context of three typologically unrelated languages in contact, L3 learning is likely to be driven by the motor routine of the L1.

Other studies do nevertheless highlight a unique character of L3 phonological acquisition by documenting conditions in which it is the L2 system which is favored for transfer. In the oft-cited study by Hammarberg and Hammarberg (1993, 2005), an L1 English speaker with excellent knowledge of L2 German was found to speak with a distinct German accent in her L3 Swedish. As her experience with the L3 increased though, the German-colouring of her L3 articulations decreased and L1 influence took over as a basic constraint. It this case, the L2 seems to have accumulated a number of factors which conditioned its influence on the target language—recency of use, level of proficiency, and foreign language status. In fact, the learner reported a conscious attempt to suppress her L1 phonetic setting in the production of the L3 to avoid sounding English-like. Also, her performance was found to be task-related; when performing repetition tasks, the learner's pronunciation was colored by the L1, while when faced with more complex tasks, such as reading and narration, she relied on the L2 as a coping strategy. Wrembel (2010) also found L2 CLI in her foreign accent study with L1 Polish learners of L3 English, who were proficient L2 speakers of German. Due to the convergence of L2 status and psychotypology in this case, she was unable to determine which of the two conditioned the L2 transfer. Llama et al. (2010) addressed this question by including two groups of learners, one with L1 English and L2 French and the other with L1 French and L2 English; their study demonstrated that the L2 status—cognitive association of non-native languages—may be the driving force for L2 transfer in the acquisition of L3 Spanish VOT patterns.

De Angelis (2007: 21) introduces yet another possibility in this connection, namely multiple sources of transfer in L3 learning, rather than L1 or L2 only. She refers to this phenomenon as *combined CLI* and defines it as occurring:

> (…) when two or more languages interact with one another and concur in influencing the target language, or when one language influences another, and the already influenced language in turn influences another language in the process of being acquired.

Early evidence of this type of combined transfer was offered by Chamot (1973) who examined the acquisition of L3 English by a French/Spanish bilingual boy, reporting a negative impact of the presence of similar vowel sounds in both his L1 and L2. Apparently, the boy's inaccurate production of L3 vowels was reinforced by the presence of near-identical phonetic features in his background languages, resulting in what was called 'double interference' in the study. More recently, Wunder (2010) investigated the acquisition of L3 Spanish voiceless stops by L1 German speakers with L2 English, noting compromise L2 VOT values transferred to L3 productions. The largest part of her dataset included instances of hybrid VOT values, however, which were uncategorizable as to whether they stemmed from the learners' L1 German or L3 Spanish. The study also showed a great deal of variability in the L3 learners' productions, which raises the question of the extent to which individual differences, such as the learner's linguistic awareness, may play a role in L3 phonological transfer. The findings of a recent research project conducted with Chinese/German adolescents acquiring English and French as their L2 and L3 in a formal learning setting suggest that phonological awareness —arguably extending to typology judgments with regard to transferability—can have a positive influence on the production of L3 prosody (Gabriel et al. 2012).

Finally, there is also the possibility for CLI in which the L3 affects the previously learnt languages. Gut (2010) reported no L3 transfer effects on the L2 in terms of speech rhythm and vowel reduction. In fact, her study results pose the question whether phonological properties of the L3 can play a more important role than CLI in L3 acquisition since very little interplay at all was found between the languages examined. In a study by Trembley (2007), one of the four participants did show L2 VOT values in L1 productions of stop phonemes, but very little is still known about this type of CLI. As noted by Cabrelli Amaro (2012), further examination of L3 regressive transfer would be worthwhile not only in respect of the examination of the different CLI phenomena in L3 phonology, but also in respect to some unresolved issues within L2 acquisition theory.

The present study aims to contribute to this line of research by examining possible sources of and conditioning factors for both progressive and regressive CLI in the segmental production of child L3 learners at the onset of their L3 instructed learning.

3 Rhotic Sounds in German, English and Spanish

To examine CLI in the productions of the child L3 instructed learners, rhotic sounds were chosen for the empirical study reported here. These vibrant sounds are realized differently in each of the languages under investigation, i.e. L1 German,

L2 English, and L3 Spanish, allowing for a fairly straightforward identification of the source of phonetic transfer in the learners' productions. First of all, the rhotic sounds of German are typically uvular, while those of English and Spanish are dental or alveolar (Ladefoged and Maddieson 1996). In addition, three different manners of articulation for each type are possible. When it comes to German, the *uvular trill* /ʀ/ can occur in some conservative varieties of Standard German, especially word-initially, although the *uvular fricative* /ʁ/ features as the most frequent realization of the rhotic sound in German today, being either voiced or voiceless depending on the neighbouring consonants (Kohler 1999). Acoustically, German uvular sounds show low second formant frequency together with a somewhat high third formant frequency (Ladefoged and Maddieson 1996). In contrast, the English *alveolar approximant* /ɹ/ is typically produced with a markedly low, below 2,000 Hz, third formant (Delattre 1965). It is also notable that the rhotic sound is always pronounced in American English, whereas in British English it is only produced in the onset position and remains silent in the syllable coda. In respect to the present study, such a silent 'realization' in the L3 productions of the child learners could be interpreted as a type of combined CLI since in German any r quality is also lost post-vocalically before a consonant (Kohler 1999). Finally, in Spanish, a distinction is made between two types of rhotic sounds, the *alveolar trill* /r/ and the *alveolar tap* /ɾ/. The sounds contrast in intervocalic positions; otherwise, the trill occurs in word onset, while the tap is common in other contexts (Martínez-Celdrán et al. 2003). For the alveolar trill, the tip of the tongue vibrates rapidly against the alveolar ridge, resulting typically in two to three periods of vibration, whereas the alveolar tap involves a single short closure against the rear of the upper front teeth or the alveolar ridge (Ladefoged and Maddieson 1996; see Fig. 1 and Fig. 2 for illustration). As shown by Recasens (1991), the Spanish /r/ is not to be treated as a geminate version of the /ɾ/ since the two sounds are articulated with different lingual gestures in that the former involves more apical retraction and more predorsum lowering than the latter. A summary of the 'r' sound classifications for this study is provided in Table 2 below.

No study to date has explored the acquisition of Spanish rhotic sounds to determine CLI in the context of L3 learning. Hammarberg and Hammarberg (1993) make a brief note about the presence of L2 uvular approximant-coloring in their L3 Swedish learner's productions in a story narration as well as in a read-on-your-own condition at the onset of her L3 learning. This pattern was lost for L1 alveolar approximant productions in the speaker's L3 1 year later.

There is also paucity of research on the acquisition of rhotic sounds in the L2 context as well, which may be due to a variety of reasons, starting with the point that Spanish /r/ shows a high level of variability in the productions of native speakers themselves (Hammond 2000). Also, the production of the Spanish trill requires a high degree of articulatory and aerodynamic precision, which makes it a challenging sound for speakers in general. In fact, it is acquired rather late in the L1 development, with most Spanish children producing the trill consistently as late

as around the age of seven and the tap around a year earlier (Carballo and Mendoza 2000).

One study which did involve L2 acquisition of a Spanish rhotic is Reeder (1998), examining the production of trills in L2 Spanish by native speakers of English. Accuracy of the /r/ production was judged auditorily in the study, and operationalized as the number of contacts per trill. The results showed that the number increased, on average, from 0.6 at the beginner level to 2.6 at the advanced level. Similar results were reported in an experimental study by Johnson (2008), who documented an increasing ability of university students to produce trills as their proficiency levels increased. What is noteworthy is that the L2 learners showed a pattern of increasing substitution of the alveolar tap—the other rhotic sound occurring in Spanish—as an intermediate strategy at the moment when they had ceased to transfer L1 alveolar approximant but had not yet acquired the ability to produce trills consistently. The trills produced successfully by the L2 learners were further evaluated in the study for their aerodynamic properties to determine the level of native-likeness of the productions, the finding being that non-native acquisition of Spanish trills can be both categorical and gradient. In other words, it was suggested that once the occurrence of trilling experiences its dramatic jump after remaining flat for some time, it begins to grow more native-like over time, with intervocalic trills apparently being the easiest to produce in comparison to post-pausal and post-consonantal trills. Whether similar patterns are also to be identified in other groups of learners remains to be examined.

4 Research Questions

In light of the foregoing, the following research questions were set for the present study:

1. Do beginner L3 instructed child learners differentiate between L1, L2, L3 with respect to the production of rhotic sounds?
2. What type of transfer phenomena do the learners' L3 rhotic productions demonstrate?
3. Is there evidence of L3 regressive transfer in the L3 learners' L2 and/or L1?

As there has been insufficient research on the non-native acquisition of Spanish rhotics, no specific hypotheses were formulated a priori. It was expected, however, that the child L3 learners—despite being beginners in their L3 learning and to some extent in their L2 learning as well—would differentiate between their L1, L2 and L3 productions of the sounds. It was also expected that the learners would be more successful at producing the L3 tap than the L3 trill. Finally, different transfer phenomena *alongside* L1 were expected to be identified in the learners' non-native productions, including that of L3 regressive transfer.

5 Methodology

5.1 Participants

The participants in this study were 20 children (11 girls and 9 boys) in the sixth grade (11–12 years old) of a grammar school in Nordrhein-Westfalen, Germany. All were German native speakers; five of the participants were raised bilingually and thus had another native language besides German. This will be accounted for in the results section. The participants had a fairly homogenous profile with respect to both their L2 and L3. At the time of the study, the children had been taught English for at least 3 years, and had recently been introduced into Spanish (3 months previously); hence, the chronological distinction for L2 English and L3 Spanish (cf. Hammarberg 2010). They were attending English classes for 3 or 4 h a week (180 and 240 min, respectively), and Spanish classes for 3 h a week (180 min). Most of the children evaluated their English competence as good (two on the scale of five, one being very good); nevertheless, when formally evaluated, significant differences in L2 oral fluency were found between those who were exposed to English for three contact hours a week and those with four hours a week of English lessons (t (18) $= -2,63$; $p < 0.05$). In further analyses, the child participants were therefore divided into two groups (higher L2 exposure/lower L2 exposure). It should be recalled though that all the children had experienced 3 years of instructed English, on average, at the time of the study, following the curriculum of A2 level English according to the *Common European framework of reference* (CEFR; Council of Europe 2001). Overall, their L2 proficiency was thus rather low. In evaluating their ability in Spanish, bearing in mind that they had been introduced into the language only recently, the higher L2 fluency group was slightly more critical about their L3 skills than the lower L2 fluency group. This pattern also held true for the children's perceptions of challenges related to L2 and L3 pronunciation. Both groups seemed indifferent about sounding native-like in their L3, emphasizing the need for a communicative ability in the language

Table 1 Language learning background of the child participants (means for age of first contact are provided in years, and for oral L2 fluency score; modes are provided for self-assessment of proficiency, where 1 = **very good and 5 = very poor, pronunciation difficulty, where 1 = very easy and 5 = very difficult, and ambition to sound native-like, where 1 = very important and 5 = very unimportant**)

	Lower L2 exposure group (N = 13)		Higher L2 exposure group (N = 7)	
	English	Spanish	English	Spanish
Age of first contact	8	11	7.14	11.29
Oral L2 fluency score	121	–	183	–
Self-assessed proficiency	2	2	2	3
Pronunciation difficulty	2	2	3	3
Native-like ambition	2	3	2	3

instead. Table 1 below summarizes the language learning background of the two groups of child L3 learners.

The children's metalinguistic comments revealed that 55 % of the sample found it useful to have some command of English when learning Spanish, mainly in respect to vocabulary learning and language learning strategies. In fact, some pupils reported their Spanish teacher occasionally using English in their classes to support the learning process. In contrast, the majority of the child L3 learners saw no relationship between their L1 and L3 learning, which seems to point to the oft-reported cognitive dissociation between native and non-native languages in the mind of multilingual learners (De Angelis 2007; Llama et al. 2010).

5.2 Data Collection

The child participants were recorded in all their languages, i.e. in their L1 German, L2 English and L3 Spanish. First, they took part in an interview with a native speaker of German in which they shared their experience of learning languages in general. Next, the pupils engaged in a session with a native speaker of Spanish, performing language tasks in three conditions—picture naming, reading a text, and responding to questions in a brief interview. These tasks were carefully designed to include only the vocabulary and structures that the pupils had learnt, while eliciting the target segments. Finally, the pupils were interviewed in the English language by the author, who is a near-native speaker of English, eliciting information about their formal and informal experiences with learning the L2. Together, the three recording sessions took 30 min to complete. The children were consistently approached in a supportive manner, which emphasized the enjoyable aspect of taking part in the study.

5.3 Procedure

The recording sessions were conducted with each pupil individually in a quiet classroom in their school. The pupils wore a head-mounted Sennheiser microphone (PC 131) and their speech was recorded on an Edirol R-09 digital recorder at 22.05 kHz sampling rate with 16 bit quantization.

A total of 60 rhotic sounds were elicited from each participant. The first five realizations of the 'r' sounds produced by the children during interviews in their L1 and L2, respectively, were selected for analyses together with 50 tokens elicited in the three L3 tasks. In the picture naming task, the children were asked to name each target word (and those of 30 additional distractors) at the moment a representative picture of each was displayed; these 10 Spanish words (/r/: 'gui-tarra', perro', 'rojo', 'revistas', 'romántica'; /ɾ/: 'pera', 'periodista', 'favorito', 'colores', 'naranja') were elicited in a random order three times each. During the

first elicitation, the children saw the written form and heard[2] the name of the picture via headphones as the picture was displayed. The second elicitation followed the same procedure, with the exception of the orthographic form of the picture being removed this time. For the final elicitation, the children said the name of the picture upon seeing the visual prompt only. In the next part of the Spanish session, the pupils were asked to read a brief text about a teenager from Barcelona, which included the very same target words as had appeared in the preceding picture naming task. Finally, the children responded to 14 short questions about themselves and their family members. These again were linked to the previous tasks as much as possible, and based on the review of the topics and structures that the pupils had encountered.

Instructions were given only in Spanish in the L3 part of the session and were accompanied by appropriate modeling and body language by the researcher. In fact, each of the trained study collaborators was instructed to attempt a monolingual mode under all circumstances (Grosjean 2001). The participants were not told about the focus of the research, but rather that the aim of the meeting was to share experience with their learning of languages in general.

5.4 Oral L2 Fluency

The fluency measures used in the present study conform to the proficiency variables which have proven to correlate well with impressionistic fluency ratings (e.g. Pennington 1992; Kormos and Dénes 2004) and to discriminate between low proficiency young instructed learners (Mora 2006): speech rate in words, speech rate in syllables, L1 word ratio, and maximum length of utterance in words.

The speech rate calculations were made on the basis of the total duration of the English interview calculated in seconds, excluding the interviewer's turns and including only the learner-produced utterances. The speech productions thus measured ranged from 71 to 164 s (mean 111.65 s). The *speech rate in words* (L2SRWm) was calculated as the number of words in the interview per minute. Similarly, the *speech rate in syllables* (L2SRSm) indicated the number of syllables in the L2 words computed in the interview per minute. The *L1 word ratio* was calculated as the number of L1 words per 100 words produced by the learner; an equivalent L2 word ratio (L2WR) was then used in the calculation of the composite oral L2 fluency score (see below). The *maximum length of utterance in words* (L2MRW) was the number of words in the longest run of speech without pause disfluences (>4 s). Finally, a composite L2 oral fluency score was calculated by computing the mean of the four measurement scores, using the following

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[2] The stimulus words were recorded by a male native speaker of Peninsular Spanish, who was the same speaker as the L3 session convener.

formula: L2SRWm + L2SRSm + L2WR + L2MRW/4. This composite score was used in all later analyses in which the factor of L2 oral fluency was included.

5.5 Data Analyses

Audio and acoustic analyses were performed on a total of 1,200 tokens (60 × 20 participants) using *Praat* (Boersma and Weenink 2013). Tokens which were mispronounced were excluded from the analyses. The count for each variant that occurred was calculated for each subject in each speaking style; this was done both for items with the trill as the target and items with the tap as the target. Figures 1 and 2 show sample waveforms of the correct target items produced by an L3 child participant in the study; if a waveform showed two or more periods of closure, the segment was classified as a trill (Fig. 1), whereas if it showed only one, it was classified as a tap (Fig. 2).

Following Ladefoged and Maddieson (1996), the other classifications based on the occurrence of the rhotic sound concerned in either the initial or intervocalic position included a uvular trill, a voiced uvular fricative/approximant, a voiceless uvular/glottal fricative, an alveolar approximant, a rhoticized vowel sound, and a low central vowel. In further analyses, these sounds were interpreted as translating

Fig. 1 Waveform for *perro* ('dog'), produced with a three-closure trill /r/ by a beginner L3 child learner
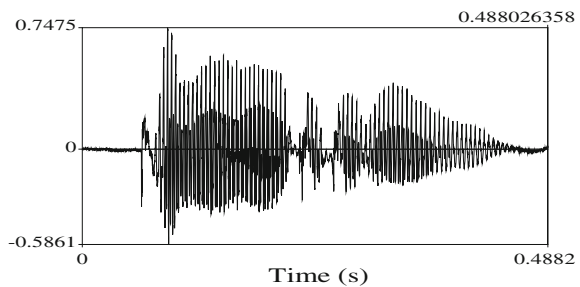
Fig. 2 Waveform for *pera* (pear), produced by a beginner L3 child learner with the expected tap /ɾ/ in the intervocalic position
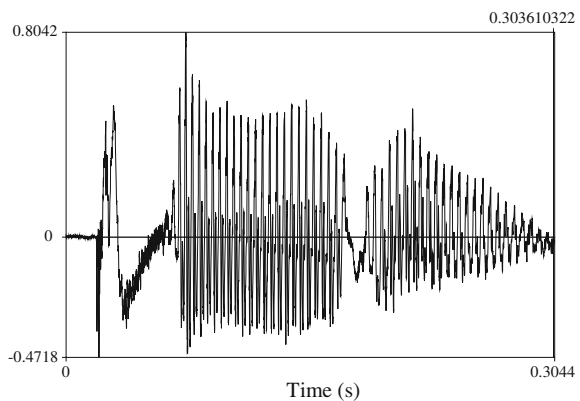
Table 2 Classification of the rhotic sound realizations in the study

Definition	Symbol	Acoustic cues	Source
Uvular trill	R	Uvular vibration; F3 > 2,500 Hz	L1/Interlanguage[1]
Voiced uvular fricative/ approximant	ʁ	Short turbulent airflow; F3 > 2,000 Hz	L1
Voiceless uvular/ glottal fricative	x χ h	Long turbulent airflow; F3 > 2,000 Hz	L1
Retroflex/alveolar approximant	ɻ ɹ	F3 < 2,000 Hz	L2
Rhotocized vowel sound	–	Alveolar/dental articulation; F3 > 2,000 Hz	Combined L1-L2
Low central vowel/ zero sound	Ø	Silent *r* sound	Combined L1-L2
Alveolar trill	r	Alveolar articulation; two or more occlusions; F3 < 2,500 Hz	L3/Interlanguage
Alveolar tap	ɾ	Alveolar articulation; one occlusion	L3/Interlanguage
Inconsistent anticulation	–	–	Varied

[1] Please refer to the data analyses section for the rationale of the *interlanguage* classification in this study

[2] It is noted that the *voiceless glottal fricative* /h/ occurs both in German and English in the initial and intervocalic positions under examination here. The L1 classification for the relatively rare /h/ realizations in this study (n=14) of an attempted L3 rhotic sound was guided by careful comparisons of the respective speaker's L1 German and L2 English rhotic productions, which showed no /h/ realizations of the sounds concerned in their English. The difficulty of identifying the source(s) of CLI in this case, however, needs to be acknowledged

into different CLI phenomena. The related acoustic cues which drove the classification of the different realizations of rhotic sounds produced in this study are provided in Table 2. One should note that "rhoticized vowel sounds" refer to those r sound productions which lacked a rapid dip in amplitude and were realized with high F3 values, suggesting a combined CLI from both the L1 and the L2. Similarly, those r-less sounds which were realized either as a low vowel or disappeared altogether were also classified as a type of a combined CLI, in which the non-rhotic realization in pre-consonantal contexts seems reinforced by both the L1 and the L2, and transferred further to the L3. Finally, 'interlanguage' forms refer to those L3 productions which were realized as the other L3 target (e.g. when a tap was produced in the attempt for a trill) or the case of the target alveolar trill production as a uvular variant, provided the analyses of the L1 productions of the speaker indicated no trilling in their native language; such an L3 realization was thus not interpreted as stemming from the L1, but rather as approximating the target L3 trill with an underlying L1 feature. If the L3 learner's productions showed an inconsistent articulation—mixing any of the conceivable forms—they were classified as 'varied'.

In addition to the acoustic analyses, the accuracy of the L3 productions was independently evaluated by a native speaker of Peninsular Spanish (with no

linguistic background), who assigned a binary value of either 'correct' or 'incorrect' to each of the L3 productions. The level of agreement between the acoustic and the impressionistic evaluations proved to be high (93 %).

6 Results

6.1 CLI in L3 Spanish

To determine CLI in the L3 speech of the child L3 learners, the proportion of trill and tap targets produced as one of the six realizations stated in Table 2 above was calculated for each speaker and each task. Next, using frequency analyses, a possible association between the L3 child learners' amount of L2 exposure/level of L2 oral fluency and their L3 productions was examined. For the case of /r/ productions, the analysis yielded no significant result [χ^2 (4) = 8.19, p = 0.085]; however, the two groups of L3 learners (higher and lower L2 exposure) were found to differ in their productions of /ɾ/ as the target [χ^2 (3) = 27.041, p = 0.000]. Accordingly, further analyses were performed on the data either for the whole sample or for the higher and lower L2 exposure groups of L3 learners in comparison, where relevant.

As Fig. 3 illustrates, the data on the production of /r/ by the child L3 instructed learners shows high levels of variability. This may be expected at the onset of L3 learning, but what seems pertinent in respect to the focus of the current study is that the L1 was by no means the only source of transfer in the L3 learner's productions. A comparable proportion of the realizations featured the non-target production of the L3 /ɾ/, or a uvular variant of the trill by speakers who nevertheless do not trill in their L1. No L2 transfer as such was identified in the L3 /r/ productions of this sample, and only around 4 % of the sample demonstrated a consistent combined influence from their L1 and L2.

Fig. 3 Sources of transfer for realizations of /r/ as the target (*across* tasks) by child L3 learners
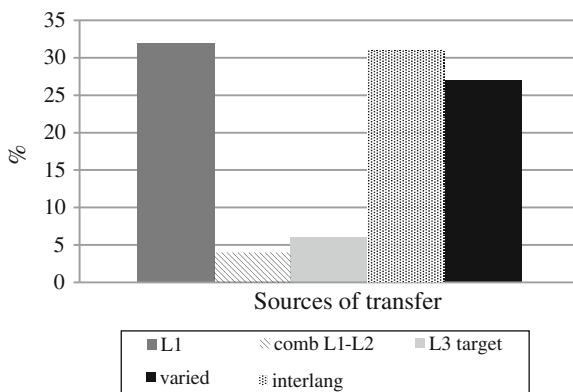
When the data was further examined in terms of the occurrence of each of the realizations of the L3 /r/ productions in the sample and the learners' background variables, a significant positive relationship was found between the productions showing combined CLI and the L2 oral fluency score, $r = 0.53$; $p = 0.016$ (two-tailed). In other words, the higher the L2 oral fluency of the child L3 learners in this study, the higher the occurrence of their /r/ productions displaying simultaneous L1-L2 influence (see Fig. 4 below).

It may seem surprising that some of the beginner L3 learners were actually able to produce the challenging /r/ sound target-like. Upon closer examination, it was noted that it was the L3 child learners brought up bilingually who tended to be successful at producing this vibrant sound [t (18) = −2.890, $p < 0.01$). The additional L1 languages reported by the participants concerned were Russian, Croatian, Polish and Italian, all of which actually have the alveolar trill in their consonant inventories.

Frequency analyses of the /r/ data within the different task types used in this study yielded no significant results as to the association between the L1, inter-language, and varied production, respectively, and the five production tasks (the *expected* frequencies for the other realizations were lower than permissible in *Chi* square test analyses) [$\chi 2$ (8) = 3.69, $p = 0.88$]. As Figure 5 below shows, the child L3 learners in this study relied most on the L1 in the very first task—the picture naming task, in which they could both hear and see the name of the target item. The L1-colouring was also featuring in their free speech. The reading task in turn generated least L1 influence, but no target-like production of the /r/ sound. Together with the free speech task, the reading task triggered a degree of combined L1-L2 influence in the learners' production of the /r/ sound though. These patterns are broadly in line with what previous studies found in terms of task-related variability in L3 phonology in that more cognitively demanding tasks are likely to trigger reliance on the L2 as a coping strategy (Hammarberg and Hammarberg 1993).

Fig. 4 Correlation between L3 trill productions showing combined CLI and L2 oral fluency score in the sample
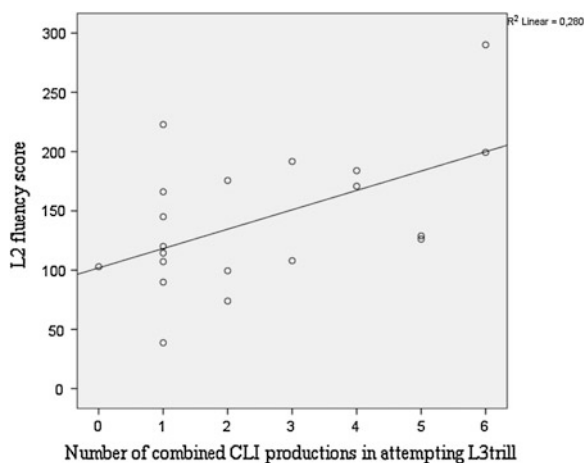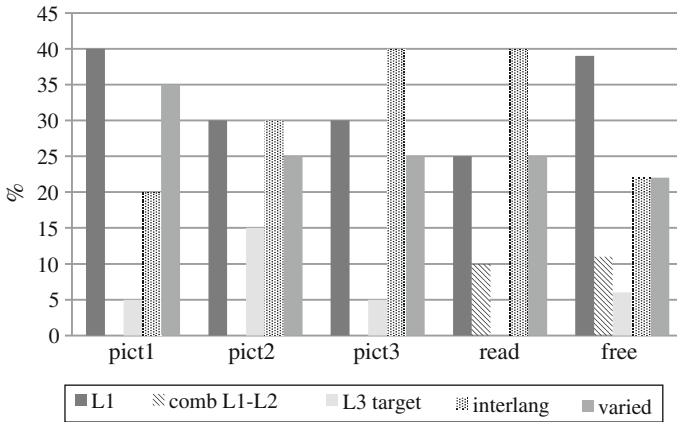
Fig. 5 Task variability and CLI in child L3 learners' productions of /r/ as the target

Fig. 6 Sources of transfer for realizations of /ɾ/ as the target (across tasks) by child L3 learners (as of their L2 exposure)
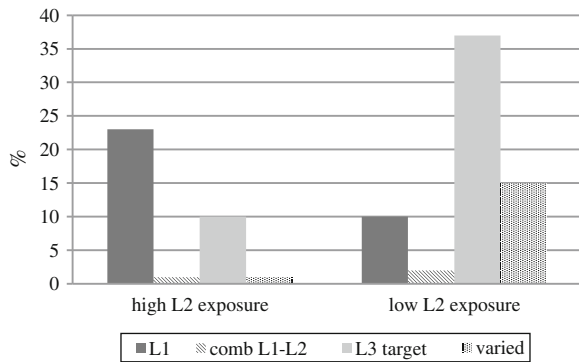
When it comes to the production of the target /ɾ/ sound, almost half of the beginner L3 child learners produced the elicited tokens in a native-like manner and a third showed L1 transfer effects. Interlanguage and combined L1-L2 forms occurred rarely. In comparison to the production of the trill sound, the L3 child learners found the tap apparently much easier to produce, a result corresponding to the developmental patterns in the acquisition of these segments by L1 Spanish children.

As shown in Fig. 6, however, significant differences were found between those L3 child learners who reported more L2 contact hours and those with a lesser amount of time spent on learning English. The low L2 exposure learners were more likely to produce the target L3 tap native-like than the high L2 exposure learners did. In parallel, the latter group of learners demonstrated more L1-colouring in their production of the L3 sound.

To summarize, the analyses of the child L3 learners' productions of L3 Spanish /r/ and /ɾ/ segments showed that the beginner L3 learners in this study differentiated between the two L3 rhotic sounds; they were largely successful in producing

the tap but showed high levels of variability in attempting to come to grips with the trill. In terms of the CLI patterns, L1-coloring occurred in their production of the sounds in equal proportion with interlanguage forms, and the influence of the L2 only occurred together with L1 as a type of combined CLI.

6.2 Rhotic Sound Productions in L2 English and L1 German

To examine whether the lack of L2 only transfer in the L3 rhotic productions of the child L3 learners in this study could be related to their acquisition rate of the target L2 sound itself, the learners' 'r' sound realizations in the English interview were also analyzed. It was found that only two out of the 20 learners consistently produced alveolar approximants with a mean F3 value typical of English. More than half of the sample produced interlanguage forms when attempting the L2 target, i.e. their articulation of the sound was actually realized as an alveolar approximant or as a retroflexed vowel sound, but with F3 values above 2,000 Hz, pointing at retention of some L1 features in their L2 production of the rhotic sound. The L2 'r' sound productions of only three children demonstrated a full L1 transfer. Figure 7 shows the proportion of each type of the L2 'r' realization from the pool of 100 L2 tokens (5 tokens × 20 learners). What may be noteworthy is that a small proportion of the learners' L2 'r' productions was realized as an alveolar trill or tap, i.e. L3 segments. This observation may reflect chance results, but it is worth mentioning that a further look at the individual cases revealed that the speakers concerned were also those who produced the L3 sounds target-like in their L3 speech.

When it comes to the L3 learner's 'r' sound production in their L1 German, the uvular fricative and uvular approximant were the two most frequently occurring realizations in both onset and intervocalic positions. Individual cases of uvular trilling were identified in the L1 speech of eight child participants. Out of the pool of 100 L1 tokens (5 tokens × 20 learners), again a very small proportion was articulated as a tap; a comparison with the respective child learner's productions in

Fig. 7 Sources of transfer for L2 *r* sound realizations in L3 child learners
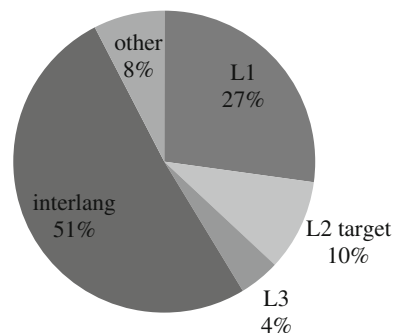
their L2 and L3 revealed that these instances were rather a case of idiosyncratic pronunciations.

7 Discussion

What emerged in this study, and what is relevant for the first research question outlined above, is that beginner child L3 instructed learners do differentiate between the 'r' sounds of their languages. The study participants articulated the L1 rhotic sounds as uvular whereas the L2 rhotics were largely realized as alveolar. The majority of the child L3 learners successfully produced the L3 tap, and showed a tendency for tapping as a sort of 'bridge' production *en route* to mastering the challenging L3 trill sound. This seems a very suitable strategy on the part of the learners since—as different as taps and trills are from each other in articulatory terms—the tap is still a consonant perceived to be a one-strike version of the trill, and it is certainly closer in sound and articulation to the trill than German uvular fricative or English alveolar approximant. This substitution pattern suggests that there is a role for yet another factor in L3 phonological acquisition, i. e. that of markedness. Major (1986) found that a less marked sound can substitute for a more marked one which is still novel for the learner's interlanguage phonology, and this pattern was observed in tap substitution for the target trill in Spanish. In the context of the present discussion, Llama et al. (2010: 51) thus argue that the L3 phonological system consists of a balance between all the languages in contact and the universal properties of language. Also, given that the /ɾ/ features among the first three most frequent consonant sounds in Spanish, while the /r/ occurs much more rarely (Delattre 1965), the abundant presence of the single vibrant phoneme in the L3 learner's input may have had a bearing on the present findings. A further point worth recalling is that apart from being highly marked, the trill is a physically demanding consonant which is mastered rather late in L1 acquisition, and may therefore require more time to learn to produce consistently in the non-native language than other sounds (cf. Johnson 2008). This point goes hand in hand with the finding of the present study in relation to the higher success rate on the part of the child L3 learners whose bilingual L1 background may have provided them with greater experience of being exposed to and using the alveolar trill. In any case, the group of child L3 learners did demonstrate awareness of the distinction between the two phonemes, however unsuccessfully they may have produced the correct variants. This in itself may come as striking considering that the children had been exposed to instructed Spanish for only about 3 months at the time of the study. One reason for this outcome may be related to the level of the learners' L3 phonological awareness which was encouraged by their teachers' use of methodologies and a course book incorporating an explicit focus on phonetic form and rich audio material. In combination with their multilingual skills, the learners may have been able to approach the acquisition of the L3 sounds more

efficiently. This would be in line with the findings reported by Gabriel et al. (2012) on the acquisition of L3 prosody in a comparable group of multilingual learners.

In reference to the second research question, the results in this study confirm the findings of previous research conducted with adult L3 learners, namely that L1 does not play a privileged role in L3 phonological acquisition. The L3 'r' sound productions of the child L3 instructed learners exhibited a fairly balanced influence from all their languages. This finding corresponds to the basic tenet of the Cumulative-Enhancement Model (Flynn et al. 2004) which predicts that all languages may act as a source for transfer, and that language acquisition has a scaffolding effect in the sense that previous knowledge enhances subsequent language acquisition. The underlying L1-colouring of the /r/ productions by the child L3 learners in this study would be nevertheless suggestive of the view that L1 transfer is favored in the context of typologically unrelated languages in contact (cf. Wrembel, 2012). Arguably, the rhotic sounds in the three languages concerned here are so distinct in phonetic terms that the L3 learners may not have perceived much resemblance between them. This is especially likely given the children's metalinguistic comments on the relationships between their languages which pointed to their perception of no particular similarities or differences between the phonologies of the languages. The L2 influence in the L3 learner's rhotic productions was documented only to a lesser degree and in tandem with L1 as a type of combined CLI in this study, possibly due to the co-factor of generally low L2 proficiency of the learners and the fact that the target L2 feature was not yet fully acquired. This explanation is especially likely in light of the present finding of a relationship between the occurrence of the combined CLI influence and the learners' L2 oral fluency.

One of the more unexpected findings of this study relates to the different transfer patterns identified in the /r/ productions by the two groups of L3 child learners, who differed in their amount of L2 exposure/L2 oral fluency. Those L3 learners who were engaged in more L2 learning tended to transfer their L1 into the L3 /r/ productions to a greater extent than those who had a balanced exposure to both L2 and L3 at the time of the study. Assuming that greater L2 exposure and/or L2 proficiency lead to a greater likelihood of L2 transfer in the initial stages of L2 learning, the result of this study is rather puzzling. A possible explanation may, however, be found in the learners' orientations towards their non-native languages. What transpired from the interviews with the child L3 learners is that the higher L2 exposure group was more critical about their ability in Spanish as well as their pronunciation skills. Apparently, their greater engagement with the L2 built their confidence in the L2, but not in the L3. In contrast, the lower L2 exposure group enjoyed a balanced contact with their non-native languages and reported excitement from learning a new language. This constellation might have motivated the lower L2 exposure group to aim at a native-like performance in their L3 to a greater extent.

The last research question considered this study concerned the phenomenon of regressive transfer. Similarly to the findings reported in Gut (2010) no significant results were found for L3 influence on either the L2 or L1 rhotic productions of the

child L3 learners tested here. It is likely that the L3 learning experience of the children was not sufficient enough to result in any regressive transfer. Previous studies conducted with L2 child learners indicate that L1 phonology will be affected by the phonetic properties of the non-native language only after many years of substantial native-speaker input and L2 use (Flege 2007). Yet, the few instances which showed L3-L2 transfer effects in this sample suggest, that regressive transfer deserves further attention in L3 phonology studies to be conducted with different language learner groups.

8 Concluding remarks

As pointed out by Cabrelli Amaro (2012: 54), the study of L3 phonology is both theoretically relevant and practically necessary in today´s world of multilingualism. The new field of L3 phonological acquisition promises to bring some important insights for our understanding of the dynamic interplay between the sound systems in contact and the factors that conspire to condition such interplay. As demonstrated by the findings of this study, the native language system does not represent the only source of transfer for all subsequent phonological acquisition even in instructed learning settings and where L2 has not yet reached advanced levels. The intrinsic difficulty of the phonetic feature as well as non-linguistic factors, such as language orientation and motivation, seem to play an important role in instructed L3 phonological acquisition, and as such deserve further attention in this research area. Also, the role of the ´age factor´ in L3 phonological acquisition would be worth a systematic examination. The present author has been developing this line of investigation within the framework of the current research project. Obtaining a better understanding of age-related differences in the acquisition of L3 phonology will be important in the advancement of adequate models of non-native speech acquisition; in practical terms, it can help to determine what types of training and encouragement may be most effective for L3 learners of diverse age groups, and thus may better inform practices and expectations in terms of learning outcomes in various educational contexts.

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Crosslinguistic Influence and Bilingual Children's Weaker Language

Justyna Leśniewska and Ewa Witalisz

Abstract Various kinds of asymmetry in bilingual development have been investigated, with a distinction often being made between the 'dominant' and the 'weaker' language. One interesting question is to what extent the acquisition of the two languages resembles monolingual acquisition patterns of the languages involved. Some findings point to the independent development of two language systems, indicating that the weaker language, despite developing in a delayed manner, actually follows the same developmental pattern as when it is acquired as the only language. However, other results suggest that the weaker language differs fundamentally from monolingual L1 (or balanced bilingual L1) and resembles an L2, or provide evidence for the separation of both languages and cross-linguistic influences. This Chapter analyses the weaker language output of two unbalanced simultaneous Polish-English bilingual children with the aim of gauging the extent and nature of crosslinguistic influence. While the influence of the weaker language (English) on the stronger one (Polish) was found to be very limited, numerous non-target elements were observed in the weaker language, about half of which can clearly be attributed to crosslinguistic influence.

1 Introduction

Research studies on childhood bilingualism have reported on various kinds of asymmetry in bilingual development. The current state of affairs is aptly described by Aronin and Singleton (2012: 105) in their recent book on multilingualism:

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> The consensus here is that balanced multilinguality is extremely rare, and that, depending on circumstances, one language or another at a multilingual's disposal will be in advance of the other(s) for a particular period—at least in certain of its aspects—and that another may, as it were, take over the lead at another point.

As Aronin and Singleton note, the phenomenon of shifting balance has been documented for a long time, with the much-cited study by Leopold (1939–1949) of his daughter Hildegard being probably the best known example of an early study of childhood bilingualism. However, regardless of whether a shift in language dominance takes place or not, at a given point in time one of the languages of the bi- or multilingual is usually dominant (for a number of reasons), while the other language, or languages, are characterised by limited ability.

2 Research into the WL

There have been some studies of childhood bilingualism which focus specifically on such non-dominant languages and their characteristic features. Most of them have been carried out within the theoretical framework of Universal Grammar (UG) (e.g. Meisel 2007; Bonnesen 2009), and their authors use the term *weaker language* to refer to the less-developed language of a bilingual. This is also the term we adopt in this Chapter (henceforth abbreviated to WL).

Studies of intergenerational language transmission provide plenty of evidence for the fact that children who grow up with two languages invariably learn to speak the majority language, while the minority language is at risk of not being spoken. A large-scale study by De Houwer (2007), which investigated ca. 2000 families in a predominantly Dutch-speaking region of Belgium (Flanders), revealed that the success rate for raising actively bilingual children for all families with dual language input was 75 % (De Houwer 2007: 420). Naturally, the question that has been posed most often is "why?" There is a body of research trying to establish which factors are responsible for the fact that the children who grow up with two languages spoken at home do not necessarily become actively bilingual, or, why the acquisition of two languages is often unbalanced. So far the lack of balance has been attributed to a number of factors, most importantly to parental language input patterns (Nicoladis and Genesee 1997; Yamamoto 2001; King and Fogle 2006; De Houwer 2007) and societal influences (Portes and Hao 1998; Hammer et al. 2004). Perhaps the most interesting finding emerging from these studies is that the widely recommended 'one parent—one language' rule appears to be neither a sufficient nor a necessary condition for successful active bilingualism (De Houwer 2007). Language dominance has been found to be affected by the frequency of input and engagement (Yamamoto 2001), the amount of input from minority language-speaking relatives, friends and child care providers (Bayley and Schecter 1996), as well as the use of specific discourse strategies by the parents (Lanza 1997; Mishina 1999). More specific features of input have also been investigated, such as parental use of particular grammatical constructions (De Houwer 1997; Paradis and Navarro 2003). One more

factor which has been investigated with respect to language dominance is the gender of the parent, as a result of the traditional belief that, all things being equal, a child will favour the language of the mother over that of the father. Unsurprisingly, this hypothesis has been disproved by research (see De Houwer 2007).

The factors listed above are outside language as such. However, as Aronin and Singleton (2012: 105) point out, some peculiarities of multilingual balance may be due to the characteristics of the languages being acquired. In other words, even when the general syntactic development in each language is equally strong, there still may be an asynchronic development of certain specific phenomena in the two languages, simply because of systematic differences between these languages (see e.g. Gawlitzek-Maiwald 2000). Evidence which seems to support this view comes from studies that present cases of, for example, functional categories developing in Latvian and German from the earliest stages, but not in English (Schelleter et al. 1997; Sinka and Schelleter 1998; Sinka et al. 2000), IP being acquired later in English than in French, due to the fact that the languages differ in this domain (Paradis and Genesee 1996), or negative marking developing earlier in Japanese than in English (Mishina-Mori 2002).

In this Chapter, we are interested not as much in the reasons why a certain language is less developed than another, but in specific characteristics of the WL. Research on WL often touches on the issue of separation versus integration, attempting to answer the question to what extent the languages acquired by a simultaneous bilingual develop separately. Other important questions concern the extent to which the acquisition of the WL resembles monolingual acquisition patterns of that language, or the acquisition patterns of that language in a balanced bilingual. It seems that we can try to find answers to these questions by looking at the atypical structures in the language production of bilinguals, including ones that display cross-linguistic influence. It has been argued that such structures may help shed light on the cognitive processes involved in the simultaneous acquisition of two languages (Döpke 2000a) and that studying them may help understand the language faculty in general (Francis 2011), and thus contribute to the development of a general theory of language acquisition (Genesee 2003: 205). Most research findings point to the independent development of two language systems (Meisel 2007; Bonnesen 2009), with the WL following the same developmental patterns as when it is acquired as the only language, though possibly with a delay. Other findings suggest that WL differs fundamentally from monolingual L1 (or balanced bilingual L1) and resembles L2 acquisition (Schlyter 1993, 1994), or provide evidence for both language separation and cross-linguistic influences (Döpke 1999).

3 The Study: Aims, Subjects, Method and Results

This Chapter reports on a case study of two unbalanced simultaneous Polish/English bilingual children whose dominant language is Polish, as they live in Poland. At the time of the data collection the subject we call "A" was five years

old, and his brother, "M", was seven years old. The aim of the study was to examine specific features of the WL and assess the extent of cross-linguistic influence. The procedure involved an observation of both children over a period of 8 weeks, with all instances of non-standard use of either language being noted. Also, for English only, one-hour sessions were recorded for both children every two weeks for the period of eight weeks, of interaction with a caretaker, a native speaker of English. The sessions included elicited narrative tasks.

Generally speaking, for Polish, the dominant language, during the observation period very few deviant lexical items or structures were observed, and in most cases, no cross-linguistic influence could be observed, as in, for example:

A (5:10): Mamy w ogrodzie osiem mrówisk.

where 'mrówisko' is used instead of 'mrowisko' ['anthill'], under the influence of 'mrówka' ['ant'].

The rare cases of cross-linguistically motivated non-target forms include infrequent instances of code switching (four noted altogether during the observation period), and two very interesting occurrences of expressions which are not normally used in Polish for specific situations and seemed to be motivated by English:

A (5:11): Jestem …/hesitation/spragniony. [I'm thirsty]

X: Mógłbyś mi podać nożyczki? [Could you pass me the scissors?]
M (7: 7): Tu. [Here.]

'Jestem spragniony' is lexically and syntactically congruent with the English 'I'm thirsty', but it is an unusual choice of expression (literary/dated) for this situational context, where the expression 'chce mi się pić' would normally be used. 'Tu' ['here'] is not used in Polish when handing something to someone.

The fact that only the two instances noted above were observed means that the influence of the WL on the stronger language is clearly very limited. For the WL, however, the situation looks radically different. Numerous deviant elements were observed in the children's English language output, the majority of which seems to fall into five categories, as presented in Table 1.

The first category comprises deviant verb/auxiliary forms in contexts which required the use of the past tense. Past tense forms were found to be missing in ca. 60 % of the obligatory occasions, as illustrated by the following examples (note also the occasional use of the double past). In all of the examples below, the intended reference was to the past:

A (5:10) Look what I find.
M (7:7) Wait, I forget something.
A (5:10) We look for you and now we find you.
A (5:10): I see on the Christmas tree a cookie and I eat it.
X: And you, M., did you eat one too?
M (7:6): I see it but I didn't wanted to eat it.
X: Did you draw this calendar?
M: I didn't draw it. Mummy buy it for me.

Table 1 Non-target elements in observed English-language output

Non-target elements	A (%)	M (%)
1. Inflectional morphology—past tense forms	40	25
2. Syntax/word order: questions	20	25
3. Syntax/word order: calques	15	20
4. Collocational restrictions	5	10
5. Prepositions	10	15
6. Other	10	5

The second category is made up of incorrectly formed questions; some examples are provided below:

> M (7:7) What it says here?
> A (5:10) Where we are going?
> A (5:11) Where you are?
> A (5:11) But you don't gonna shampoo my hair?
> M (7:7) I know that it was somewhere. But where it was?

The non-target forms from both the first and the second category can occur in L1 acquisition. Table 2 presents the development of question formation in L1 English as presented by Lightbown and Spada (2006: 6–7). There are clear similarities between our data and stages 3 and 4 of Lightbown's and Spada's model. Similarly, past tense forms are well-documented to develop gradually, with no past tense marking as a stage in the developmental sequence.

While the non-target forms from categories 1 and 2 bear some similarity to forms encountered in L1 acquisition, the deviant structures from category 3 clearly mirror the syntactic structure of corresponding Polish sentences, as illustrated by the following examples:

Table 2 Question formation in the acquisition of English as L1 (after Lightbown and Spada 2006: 6–7)

L1 acquisition: question formation
Stage 1: Intonation
Cookie? Mommy book?
Stage 2: Intonation with sentence complexity. Yes/no questions. Declarative sentence order with rising intonation. Wh- questions: question word with declarative order
You like this? I have some? Why you catch it?
Stage 3: Beginning of inversion. Wh- questions maintain declarative order
Can I go? Is that mine? Why you don't have one?
Stage 4: Inversion in yes/no questions but not in wh- questions
Do you like ice cream? Where I can draw them?
Stage 5: Inversion with wh- questions. When negation included, the declarative form maintained
Why can he go out? Why he can't go out?
Stage 6: Overgeneralisation of inversion
I don't know why can't he go out

> M (7:7) He already three times destroyed the robots. [*On już trzy razy zniszczył roboty.*]
> A (5:10) So I can my robot now? (*Mogę już mojego robota [dostać z powrotem]?*)
> A (5:11) He's there where was the car. [*On jest tam, gdzie był samochód.*]

The fourth category, far less numerous than the previous ones, comprises instances of faulty selection of lexical items, which seems to be caused by the transfer of a word's collocational restrictions, as in the case of the use of the verbs 'say' and 'tell' by the subjects (both of which correspond to the Polish verb 'powiedzieć'):

> M (7:7) I'll say you what it is.
> M (7:7) I'll do it but you have to tell "please, please, please."
> A (5:10) Daddy, say me good night.

Finally, the fifth category contains cases of non-target prepositions being used in English. All of them can be attributed to the influence of Polish, as illustrated by the following examples:

> M (7:6) Daddy, can I say something **on** your ear? [*na*]
> M (7:7) I can't do it **in** this moment. [*w*]
> M (7:7)/describing a picture/He's putting a line **to** the chimney. [*do*]
> M (7:7) I'm building **from** my Lego. [*z*]
> A (5:11) Look **on** this. [*na*]
> A (5:11)/playing a board game/No, because here is the start, and you … you go back.
> Because you're going back **on** the start if you're going on the red. [*na*]

4 Discussion

Among the case studies described in the literature the one that shows greatest similarity to our findings is described by Matras (2009): a child who grew up with three languages, the father's (Hebrew), the mother's (German), and the language of the host country (English). The boy displays a strikingly similar linguistic behaviour to that of our subjects: in Matras' words, his output is characterised by the fact that "elements from both repertoire components are integrated by combining word-forms belonging to one subset of the repertoire, with organization patterns and meaning belonging to another" (Matras 2009: 23). The data presented by Matras include numerous examples of the blending of Hebrew words with German word-order rules, e.g. the placement of the negative particle after a verb in Hebrew (incorrect in Hebrew), which mirrors the placement of the negative particle in German. Such phenomena are noted as early as 2:1 and as late as 8:5. Matras also offers an extensive analysis of these phenomena. First of all, he notes that the patterns of organization are taken from the language which is the dominant one at a given point in time (initially German, then English, as the child starts to attend school). For example, at the age of six, when English becomes dominant, the child applies preposition stranding in 'wh-' constructions in German and

Hebrew (Matras 2009: 25), as in 'Was redet ihr über?' (instead of: 'worüber/über was redet ihr?'), or 'Ich bin kalt' (instead of: 'mir is kalt').

The explanation offered by Matras is that the separation of subsets of matter appears easier to maintain than the separation of the more abstract organization patterns of the construction. When the child learns to distinguish between his languages, or, in Matras's terms, when he develops sensitivity to the requirements for a particular setting, and selects the elements which comply with that setting, he learns to do it on the level of lexical items, but not structures. As a result, the abstract construction pattern is generalised for the repertoire as a whole. This ties in with the central theme of Matras's book: multilingual speakers have at their disposal not 'language systems' that can be switched on and off, but an integrated repertoire from which elements are selected during each and every communicative task-schema.

Moreover, Matras introduces the concept of *pivot-matching* to explain why the replicated pattern always conforms to most structural constraints of the selected language. It is the principal or pivotal feature of the construction that is selected; it is then matched with a structure representing a similar function in the other language, with polysemy being the key to the pivot-matching procedure ('This is but nice!'—'Das ist aber schön', 4:6 (Matras 2009: 26)). Matras also notes that modal particles, prepositions, and adverbial modifications constitute 'vulnerable categories'—a statement that is supported by our data as far as prepositions are concerned.

The above ties in with Hulk's (2000) statement that the syntactic system of one language is never completely inhibited when the child speaks in the other language, as well as with Döpke's (2000a, b) findings concerning atypical developmental structures in the speech of four German-English bilingual children (ages 2:0 to 5:0) which also occur in monolingual data but more frequently in bilingual data. She explains this fact in terms of 'cross-language cue competition', a concept deriving from the Competition Model (MacWhinney 1987): children notice similarities between their two languages and the similar structures gain strength crosslinguistically. The "tension between contrasts and similarities of structural cues" is thus offered as an explanation for "the coexistence of evidence for language separation as well as crosslinguistic influences" (Döpke 2000b: 100). The example from our data, quoted above, of A. (5:11) saying 'Jestem spragniony' ['I'm thirsty'] could also be taken as an example of such cross-linguistic cue competition at work.

Another very important point made by other researchers which finds support in our data is the hypothesis that there has to be a certain overlap of the two language systems at the surface level for cross-linguistic influence to occur (Döpke 2000b; Hulk and Müller 2000: 229). In this context, it is interesting to look at our data and discover that our subjects used correct English defining and non-defining articles in 100 % of the obligatory occasions, which is even more striking in view of the well-known fact that Polish learners of English as an L2 are notorious for their problems with English articles. It stands to reason that the complete lack of any overlap (as there are no articles in Polish) blocks cross-linguistic influence for our

subjects, whereas in the case of prepositions, severely affected, as was shown above, by transfer, the overlap between prepositions and their primary meanings in both languages is so extensive that is boosts cross-linguistic influence.

5 Conclusions

In conclusion, our findings suggest that the WL differs from both an L1 and an L2. As far as cross-linguistic influence is concerned, the WL has practically no observable influence on the stronger language, except for some signs that structures and phrases congruent with the WL may be preferred. In contrast, the stronger language clearly affects the WL, as almost half of the deviant elements in the subjects' WL output could clearly be attributed to transfer from the stronger language. The stronger language seems to affect the WL the most as far as word order and prepositions are concerned. However, the other half (roughly) of non-target forms are of a kind which is not untypical of monolingual L1 acquisition.

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Learners' Reflections on Their Narratives on L2 and L3 Learning

Muiris Ó. Laoire

Abstract The research in this chapter builds on two previous studies reported in Singleton and Ó Laoire (2006a), Singleton and Ó Laoire (2006b); Laoire and Singleton (2009), both of which indicated that in learning an L3, learners tend to draw on the language(s) they perceive as being closer to the target language (pyschotypology). Following a recent study by Markey (2011) into the nature of crosslinguistic influence and transfer from Irish as L2 to French as L3, this study investigates the extent to which the study of Irish as an L2 is facilitative of instructed acquisition of an L3. It also examines whether L3 learners of French, German and Spanish can consciously exploit the language awareness that the L2 learning experience confers. This qualitative-type study yields data from 15 learners of an L3 who have Irish as a long-standing L2 in four different educational contexts in Ireland. Specifically, it analyses the extent to which Irish can or otherwise promote conscious involvement in language learning and metalinguistic awareness, which are generally believed to be facilitative of instructed language acquisition.

1 Introduction

Much has been written internationally about the Irish language. Most studies have focused on sociolinguistic perspectives concerning language surveys, language policy, language planning and minority language. Studies of bilingualism in the

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Irish context have also contributed over the years to the general debate and research agenda on bilingualism. Fewer studies on Irish have been conducted, however, from an applied linguistics' perspectives with the notable exceptions of Harris and Murtagh (1999), Hickey (1997), and Murtagh (2007). Even fewer studies again exist on the Irish in relation to other languages on the curriculum in Ireland, i.e. the development of trilingual and multilingual competences. The data analysis in this chapter builds on two previous studies reported in Singleton and Ó Laoire (2006a; b) and Laoire and Singleton (2009), both of which indicated that in learning an L3 learners tend to draw on the language(s) they perceive as being closer to the target language (pyschotypology). Following a recent study by Markey (2012) into the nature of cross-linguistic influence and transfer from Irish as L2 to French as L3, this study investigates the extent to which the study of Irish as an L2 is facilitative of instructed acquisition of an L3.

2 Irish and Other Languages in the Curriculum

The present study was conducted among secondary school learners of Irish as L2 and of French, German and Spanish as L3. In secondary schools, students study English typically as an L1 and Irish as an L2 and generally one or two other modern languages (typically French, German, Spanish) for a period of three to five years. The exposure to languages in terms of hours of instruction is detailed in Table 1. The highest proportion of students study French as an L3 and this overall preference for French has remained stable over the years. Typically, students study French as L3, having already studied English as L1 and Irish an L2 for a period of eight years at least. A smaller number of students study German and Spanish. The number of students who presented for the terminal examination in secondary school, *The Leaving Certificate* in 2011 in English Irish, French, German and Spanish is detailed in Table 2[1]

It must be pointed out that the study of Irish is obligatory, both in primary and secondary school, and while the study of an L3 is optional, a modern language

Table 1 The exposure to languages in terms of hours of instruction

Language/years studied	Hours[a] primary	Hours secondary	Total hours
English/13 years	1480	648	2128
Irish/3 years	1480	648	2128
L3 languages/3-5 years		377	377

[a] Figures are based on averages. Hours are calculated on the basis of one hour on average daily at primary and 3 h on average per week at post-primary level for 37 weeks-the average length of the academic year

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[1] Data sourced from latest statistics available on State Examinations Commission webpage: http://www.examinations.ie/ (accessed 12 February 2013).

Language	Number sitting final examination
English	51,453
Irish	44, 453
French	26,786
German	6,955
Spanish	4,004

Table 2 Leaving certificate 2011 in languages

other than Irish is required, nonetheless to matriculate to most undergraduate courses in constituent colleges of the National University of Ireland. A sizeable cohort of students study French as an L3 who have had exposure to Irish an L2. Typically, students study French as an L3, having already studied Irish an L2 for a period of 8 years at least. Therefore, one would expect some cross-linguistic influence from Irish as learners engage in the learning of French or another language studied as an L3. One might also expect a certain awareness of the process of learning an L2 among these learners as being beneficial or otherwise to their study of an L3. The present study sets out to examine whether L3 learners of French, German and Spanish can consciously exploit the language awareness that the L2 learning experience confers.

3 Harmonization in Pedagogical Approaches to Irish and Modern Languages

Harmonization in pedagogical in pedagogical approaches to Irish and modern languages has been an area of interest to Professor David Singleton for many years. In 1990, at the advent of the revision of the modern languages and the Irish curriculum in secondary schools, in a chapter in *Teangeolas* entitled "Languages and language policy in Ireland: A personal reaction", he called for a de-compartmentalization of Irish and modern languages, believing in the potential of Irish as an L2 to foster a language awareness that could mutually benefit both the L2 and L3 language learning experience. It is important to note in passing that until the mid 1980s, Irish and other modern languages were generally researched and discussed in a completely different forum. The work of David Little and David Singleton helped to forge an alliance between them. The work in particular of the Modern Languages Project did much to advance communicative language teaching for modern languages.

This pedagogical perspective on Irish as a modern language was to be developed further through the research work at the CLCS, Trinity College where David Singleton worked. Research chapters and reports emerged that contributed significantly to the teaching of Irish and to understanding its sociolinguistic status more fully (see for example, Devitt 1983; Little et al. 1983, 1984, 1985; Mac Mathúna et al. 1988). It is true to say that these publications paved the way for

radical changes in the approach to Irish in the classroom at a time when such change was crucially needed. A common approach to the teaching of Irish and modern languages was adopted in curricular reform in the early 1990s. This curricular reform was underpinned by communicative competence, cultural awareness and language awareness. All participants in the present study were following L2 and L3 approach as stipulated in this curriculum and where language and metalinguistic awareness are espoused.

4 Previous Studies on Potential Influence of Irish as L2 on L3 Learning

While researchers elsewhere have directed their attention to uncovering under what conditions and in what way prior experience and knowledge of an L2 might influence subsequent acquisition processes (e.g. Thomas 1988; Klein 1995; Sanz 2000; Brohy 2001; Cenoz 2004; Jessner 2006; Cenoz 2009), little research in Ireland has until recently explored this question. As stated earlier, research output on the potential of Irish as an L2 to exert influence on L3 acquisition, or to open windows on language awareness for learners of L3 in Ireland is limited to a few studies which are outlined here.

Two studies in particular emerged in recent years conducted by Singleton and Ó Laoire (2006a, b, reported on in Ó Laoire and Singleton 2009) argued more for a typological rather than an L2 factor influence in the case of L3 learning in Ireland. The first study looked at possible influence from Irish on lexical acquisition in respect of French as an L3. The results appeared to confirm that learners in their cross-lexical strategies with respect to their use of French as L3 drew more from English and only minimally from Irish. The second study examined whether learners might find WO (word order) in L2 Irish in the case of non-finite clauses of purpose in Irish facilitative in the production of L3 German where word order is similar. Here the study found that learners consciously or unconsciously drew on their knowledge of Irish in their production of the correct WO in German, even though their ability to produce other lexico-grammatical elements was limited. But when asked to produce prepositional phrases, the learners performed less successfully and there was no indication that their knowledge of Irish had any influential or facilitative effect in the accurate production of prepositional phrases in the L3. The studies concluded (Ó Laoire and Singleton 2009: 99):

> The studies taken together represent the emergence of research in Ireland into the nature of crosslinguistic influence involving more than two languages, heretofore a rather neglected area of investigation in the Irish context. Specifically, they focus on the part that Irish—the typical L2 in the Republic of Ireland plays in the subsequent learning of L3s. The issue is an almost *terra incognita* and stands in urgent need of exploration, not only for the light that such exploration might shed in general terms, but also more for implications that its findings might have for the entire language teaching enterprise in Ireland.

Ó Laoire's (2007) study examined the outcome of a number of pedagogical techniques designed to raise Irish language learners' language awareness, including consciousness-raising and attention focusing devices in phonology, dialect syntax and lexis, but did not extend to looking at investigating similar type activities in the L3.

Dillon's (2009) study investigated the L2 proficiency and L3 acquisition skills of junior learners in Irish immersion schools looking in particular at metalinguistic awareness and crosslinguistic influence. Following on from a primarily quantitative survey of all schools participating in the Modern Languages in Primary Schools Initiative in Ireland, and language testing of a smaller group of children, the study showed that where Irish language proficiency had been achieved, as in the case of learners in immersion schools, the latter independently displayed higher levels of metalinguistic awareness and evidence of crosslinguistic transfer.

Markey's (2012) study explored how prior experience of L2 Irish could be harnessed in the learning of French as an L3 by learners in English mainstream and Irish immersion secondary schools. The study looked at how these learners reported their representations of language and language learning and showed, in spite of various contradictory findings, that a sufficient number of learners in the different types of schools attested to the fact that Irish as an L2 was generally helpful in the learning of French as an L3. These students in declaring that their experience of Irish had been facilitative emphasized the following points (Markey 2012: 311): vocabulary, the experience of learning a language other than English and openness to all language learning.

These studies taken together represent an emerging area of study. While the studies by and large confirm the facilitative influence of Irish as an L2, the findings so far are nonetheless inconclusive and uncertain. The present study while taking the previous studies on pyschotypological/L2 influences and metalinguistic awareness into account proposes to focus less on linguistic intuitions and knowledge of relationships between languages (James 1996) and more on learner experience of learning Irish, termed here as the learner's L2 narrative, as being facilitative of learning an L3. Language awareness, as James remarked (1996: 148) has given teachers and learners a provisional license to talk about language; this is the approach taken in this study. Have the experience and narrative of learning Irish as L2 much in common with the learning of the L3? Do learners in their L2 autobiography display an awareness of how the L2 and L3 are acquired? How aware are they of their own learning and of the potential to transfer language learning skills, approaches, strategies and experiences from L2 Irish to L3 French, German or Spanish?

5 Aim and Procedure

This study draws on observations and findings from an exploratory research project on narratives in language learning. It has as its focus the comparison of narratives of different bilingual and multilingual learners in different learning

Table 3 Participants' linguistic profile

Learner	Years studying Irish as L2	Level being studied[a] H = Higher O = Ordinary	L3	Years studying L3	Level being studied H = Higher O = Ordinary
Learner A	13	H	French	4 ½	H
Learner B	14	H	French	4 ½	H
Learner C	13	H	French	4 ½	H
Learner D	13	O	Spanish	4 ½	H
Learner E	13	O	French	4 ½	O
Learner F	13	H	French	5 ½	H
Learner G	13	O	French	4 ½	O
Learner H	13	O	Spanish	4 ½	H
Learner I	13	H	French	4 ½	H
Learner J	13	O	German	4 ½	H
Learner K	13	H	Spanish	4 ½	O
Learner L	13	O	French	4 ½	O
Learner M	13	O	French	5 ½	H
Learner N	13	O	French	4 ½	O
Learner O	13	H	French	4 ½	O

[a] Students in Ireland can opt to study a language at a higher level with more demanding assessment criteria in the terminal examination or at ordinary level

contexts in secondary schools in Ireland. Such a comparison is not only valid in the context of authentic learner narrative, but also in terms of its contribution to the research outlined above that explores 'the mysterious middle ground' between the L2 and L3. By inviting learners to share their narratives on learning Irish as an L2 and subsequently learning French, German or Spanish as L3, this research in its initial stage sought to gain insights into how learners' experiences of learning and routes to acquisition converge or diverge and into how they consciously or otherwise transfer skills, strategies and experiences.

The participants in this study are fifteen learners of L3 who had studied Irish as an L2 for twelve and a half years and an L3 for five to six years. They were randomly selected for this study by teachers of Irish, French, Spanish and German in mainstream English schools. No immersion students participated in this part of the study. They were all in their final year of secondary school in five different schools in large urban centers. The background of the learners in terms of the languages they were studying is detailed in Table 3.

The learners were firstly invited to write two free-style (ca. 300 word) narrative (free-flowing or unstructured) essay on "What it is like for me studying Irish?" and "What it is like for me studying French/Spanish/German?". No prompts were provided. They each agreed to reflect on, and explain their narratives during a semi-structured interview which was held in their school. The interviews were conducted between February and April 2013. They began by reading both narratives aloud to the researcher and a semi-structured interview of twenty to twenty-two minutes was then conducted with each participant. By asking participant

learners to write a free-flowing written piece in advance with a view to reflecting on, and elucidating their thoughts during a semi-structured interview, the research sought to gain comparative insights into learners' perspectives on study of the L2 and L3, respectively. Further interviews took place with teachers of Irish and teachers of L3, during which they reflected on the learners' comments. For the purposes of this chapter, we focus on the contributions made by the learner participants only. The reflections by the participants on their written narratives were transcribed and the data included in this chapter comprises only these recorded reflections where reference is made to the written narratives. Findings and suggestions in the analysis that follows should be understood within the context of the exploratory nature of this ongoing research project. The data provided by participants provided a rich vein of analysis and yielded a number of striking observations which could certainly inform our understanding of the potential of learning Irish as L2 on subsequent learning of an L3. As will be seen in the next section, a number of aspects merited particular attention and these form the basis of the discussion that follows.

6 Being "Good" at Irish

The terms "being good" at languages and "having a good ear for language" have for a long time been part of the folk idiom surrounding language learning and language competence. There is a also a tradition in educational institutions (the context of the present study) of students being "good" at certain subjects, i.e. high achievers of high grades, which is perceived as the result of commitment, hard work and natural aptitude. In the case of Irish as an L2, all learners in their narratives used the word "good" or "not good", when referring to themselves as learners. As can be expected, there is a thorough familiarity by learners with what we might broadly term issues of competence or proficiency. However, it is difficult for learners to explain what proficiency means exactly to and for them. Navigating curricular content in L2 Irish with such self-perceived proficiency presents a challenge for many learners. The analysis of the narrative and interview data reveals a number of striking features in this regard. Problems and challenges are referred to more often than positive aspects associated with learning, even among those learners who profess to be "good" at Irish. In many contributions made by the learners, reference is made to either the learners themselves being good or not as good at languages as a fact or a *fait accompli*:

Learner B: I know… I have always been good at Irish but not as good as () other lads in my class.[2] I just kind of know what to say and […] and I don't know really I suppose () I was always kinda good at it
Learner I: Yeah […] I'd say I'm good at Irish but I am not: the best
R: Why would you say that?
Learner I: […] am not too sure… donna know: really. There are lads in the class (smiles) much better than me (sic).
R: O.K. […] but you wrote here that you were always good at the lan guage, why would you say that?
Learner I: […] donna know really. I think I was always kinna () good at it.

The term "good" quickly becomes a general and amorphous one, referring to learners' ability to memorize and recall. There is an emphasis on rote learning and cramming to achieve high grades in the final Leaving Certificate.

Learner O: Well, I kind of […] em..kind of () easy to learn things off essays and stuff () we have to learn the notes on the […] poetry and stuff like that and I find that kind of easy to be honest […] it's not too bad
Learner D: I hate having to do all that learning off and […] and I'd say that's why I not very good at it.
Learner J: I don't mind the learning off…I'm fairly o.k. at it and I find it easy to remember in the exam, although I gave up the Honours[3] this year.
R: O.K. so would you said here […] you were telling me you were good at the language […] so is that a reason why you think you are good at the language?
Learner J: You mean why am I good at it?
R: Is it you find it easy to remember?
Learner J: Yeah… I would say so.

Being "good" or otherwise at Irish is a *fait accompli* and in learners' perceptions, little can be done to alter this belief.

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[2] Transcription conventions:

=	latching	[…]	pause less than 1''
:	prolonged sound	()	pause more than 1''
-	interruption (self- or other-interruption)	?	question
(X)	unclear speech	(comments) researcher's notes	
[	start of overlap	*underline* stressed word/syllable	
LOUD	louder voice		

[3] Higher level.

R: But do you think you could be better, if you asked more questions for example? Teachers love questions!

Learner M: […] maybe […] but I don't think so really em […] I do: put in the work now in sixth year but no, I was always a no hoper at Irish

Learner H: I tried to put in extra work this year as I failed it last year like and I EVEN got grinds[4] but I improved a bit () but just enough maybe to PASS […] I'm still not good at it.

It also becomes clear that learners are unable to explain other than having a good memory or otherwise, the reason for their proficiency or lack of it in the language. The fact that learners begin studying the language at the age of five in primary school seems to be in a factor in their inability to explain proficiency more fully. They were "always" good or otherwise at the language. In the following extracts the influence of the teacher, and inability to grasp grammar rules are to the fore:

Learner L: The grammar an. and stuff gets to me […] it fries my head I swear (laughs). I was NO good at Irish in national[5] school and I'm not much better now () in FACT I'm worse, I'd say.

One learner, Learner N commented that the task of learning is insurmountable. There appears to be reference to synonyms or idiom and syntax as being causal factors in his/her self-attested lack of proficiency in the language:

Learner N: It's like a wall like-

R: Yes, you said that here in your essay on Irish, what did you mean by that?

Learner N: I don't know […] I suppose […] there are like so many ways of saying things

R: O.K. Can you tell me what you mean by that?

Learner N: I suppose () I suppose that eh […] there are SO many words for the same thing

R: Can you give me an example?

Learner N (laughs) = No…I told you I am SO completely useless like () no () oh my god..sorry ()

R: That's o.k.

Learner N: Another thing is I really can't understand how a sentence is put together

For some learners the role and influence of the teacher seems to have exerted either a positive or less positive influence:

Learner A: I find I was () I always liked Irish and was good at it. We had this like champion teacher in national school and it was cool after that.

Learner D: I could never really get the hang of it () Unless the teacher […] he translated it in Mr.XXXX's class () unless he translated it my god I was SO lost. For exams so () so I tried to learn it all off by heart to PASS. I see some of the lads in my class and they are just the same

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[4] Private lessons outside school.

[5] Primary school.

Learner F: Back in national school I was quite good I'd say at Irish […] but […] here in secondary school there is a lot of learning off () but, still like I'm fairly handy[6] at it –I'll be OK FOR a B[7] like…

For learners, therefore, one of the first associations they have with Irish is their own progress with, and proficiency in the language. This is largely to be expected. What was surprising here, however, was learners' acceptance of their rate of proficiency as a *fait accompli*. There is little or otherwise to be done if they do not have such a "given" proficiency in the language. The learners' narratives and comments seem to allude to the fact that being proficient in the language was a phenomenon that began in the distant past (in all cases over twelve years ago) and continued unabated and unchanged. Some reasons were evinced for not being good at the language, i.e. the extent of idiom and synonyms to be mastered, syntax and understanding of grammar. It became clear that these learners had not really reflected on their potential to become more efficient learners and to acquire the language rather than resorting to rote learning and cramming.

7 "Good" at the L3

As outlined earlier, all participants had produced written free-flowing narratives on what studying an L3 meant to them. Here the "global" and largely undefined description of being good or otherwise at language emerged again. The word "good" appeared in thirteen out of the fifteen narratives. Learners again were asked to explain what "good" meant in the case of the L3

Learner C: I mean the same thing as what is wrote (sic) here about Irish eh () you're just good at it or you're not…
Learner N: It's the same […] I mean. I see SOME of the lads in my class and they are like SO BRILLIANT in French as well
R: You mean as well as Irish?
Learner N: Yeah absolutely they are SO good like eh () oh my god they are just amazingly good.
R: And why is that do you think?
Learner N: I don't know I mean eh () I know that I could never like=
do = HONOURS[8] French.

Nearly all learners who had stated they were proficient in Irish stated that they were similarly proficient in the L3. There were some interesting exceptions, however, in this case. Learner D, for example, who had professed to never "getting

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[6] Good.

[7] I should achieve a grade B (in the final examination).

[8] Higher level.

the hang" (to succeed in learning how to do something after practicing it) of Irish had a different outlook on Spanish:

> Learner D: Yeah […] I think so. I had a good teacher in first year[9] and I just picked it up from her like and got the hang of it.
> Learner J: No, […] as I was saying like I don't mind eh () the learning off = it's easy but […] if you were to ask me like I'd swear I am a lot better in German. I don't know. In Irish I like, as I was saying learn everything off, but in German I can say things myself-
> R: That is interesting […] can you give me an example?
> Learner J: Yeah, well like […] if I wanted eh () to say ()*Ich fahre einschönes Auto* I can just say it I don't have to remember it […] from […] you know from stuff you've learned off.
> R: Could you say the same thing in Irish?
> Leaner J: Wait a minute () is () *tá mé (sic) ábalta carr a thiomáint*…is that right?
> R: What did you mean in English?
> Learner J: I drive a car?

What is interesting here is not only the deficiency in translation (in German, 'Ich fahre ein schönes Auto' translates as 'I drive a nice car', whereas 'tá mé ábalta carr a thiomáint' translates as 'I can drive') but is the ease and certainty which the learner exhibited in producing the German sentence that is noteworthy here as well as his/her perception of his/her ability (albeit somewhat flawed) to spontaneously produce language.

Learner H who expressed fear of failing Irish in final examination and had grave doubts about the possibility that doing extra work might remediate his/her lack of competence, professed to be good at Spanish and to enjoying it:

> Learner H: Yeah, I LOVE Spanish […]. I have like NO problems with it. I learn it off like but I mean […] there is like no problem-
> R: What do you mean?
> Learner H: I don't KNOW […] It's just I find it easy
> R: Is it your teacher who makes it easy?
> Learner H: Yeah, but we have a good teacher for Irish. I mean she's ALWAYS trying like to help but (), I don't know what it is…() it's just easy

For Learner M, the ease in both languages is again associated with ability to learn by rote memory:

> Learner M: Yeah, I think so ah […] it always works for me, even though there is much less to learn in French. That is why I gave up the idea of […] Honors Irish () the essays are long in Irish up to four pages sometimes- they are a pain.
> R: So it's the learning off then?
> Learner M: Yeah […] but Spanish is a lovely language. I have been to Spain a few times and this summer I am going with my boy/girl friend

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[9] First year in secondary school.

8 Difficulties

The word "difficult" arose fifty-four times in the narratives relating to Irish and thirty-seven times in relation to the L3. Interestingly, the word occurred more in the context of being good at languages. Participants were invited to reflect more fully on whether the difficulties they encountered in both language were similar or different. There is a certain convergence here in learners' observations:

> Learner A: I think Irish [...] you have to be eh [...] more careful. I mean there are so many words for the same thing.
> R: O.K. that is interesting, can you give me an example?
> Learner A: Eh [...] you know a word like *fadhb* (spelling)-
> R: The word for problem?
> Learner A: Yeah- [...] well sometimes you's see it like an *fhadhb* with a H and THEN other times = you see. *Bhfadbh*(spelling) and other
> times *faidhbe* (spelling) that, the teacher expains it and all, but I just learn it off.
> R: But is this not in French as well?
> Learner A: No [...] it's just = the one word *problème* (spelling).
> R: No () sorry, I mean masculine feminine nouns.
> Learner A; Yeah I know, but it's different in Irish.

Even though the learner mentions that there are many words for the same thing, the difficulty based on the example supplied is one that has its source in morphology rather than supply of synonyms. What is remarkable about the above extract is that it shows that some metalinguistic connections between the French and Irish languages are not being made by learners. From a language distance perspective, this is hardly surprising with both languages being equidistant: Irish being a Celtic language and French a Romance language. Irish is a highly inflected and in standard form, has vocative, genitive and dative cases. Initial mutation is common in nouns and verbs, hence the reference to 'fhadbh' or 'bhfadhb' in Learner A's observation. While morphologically distant from French, Irish nouns may be masculine or feminine, a feature shared with French, but absent from English (hence the question of the researcher—"But is this not in French as well?"). The learner, however, had never made this metalinguistic type association which could have been fostered through a language awareness approach. Another learner similarly reflected on difficulty as:

> Learner C: The words in Irish are spelt in different ways [...] like eh ()
> *Éirinn* and *Éireann*.[10] I can never get that right and [...] it does my head in
> R: How do you mean, the word is spelt differently?
> Learner C: I [...] don't know. I think our teachers says is the *tuiseal ginideach*[11] or something.
> R: So, what do you do to try and get your head around that?
> Learner C: I just [...] learn it off by heart.

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[10] Dative and genitive cases respectfully of the proper noun 'Éire' meaning Ireland.

[11] The genitive case.

It is clear that the morphological features of Irish cause difficulties for English speakers of Irish as L2. The principal mechanism deployed by the learners, however, in overcoming the difficulties appears to be rote learning and memorization. Sometimes referred to as chunking, it may be suitable as a cramming device using short-term memory for achievement in examinations, but it inevitably hinders language processing in long-term memory and neither facilitates easy retrieval nor fuels acquisition.

Other learners pinpointed similar-type difficulties, but lacked the metalanguage to be able to explain fully what they meant.

> Learner K: Well what does my head in […] is do you know the tenses () everything seems to be irregular so there is no choice but to learn it.
> R: Do you mean learn if off?
> Learner K: Yeah
> R: How do you do that?
> Learner K: Well I just keep at it it is not too bad-
> R: No, I meant do you learn the rules?
> Learner K: Well it depends, maybe if we are having a grammar test, but
> Normally, I just learn off the notes and the essays and the picture stories for the oral. I don't bother about the grammar and stuff (laughs).

This learner, Learner K was studying German at a higher level:

> Learner K: Yeah I'm doing German.
> R: And have you the same difficulties there then?
> Learner K: No, not really. Well the grammar […] the German grammar would = would do your head in,[12] but there is (sic) not all these changes to the words

The observation that there were fewer difficulties regarding morphology and mutations in the L3 compared to Irish was a common one:

> Learner A: Yeah I'm doing French and it's NO WAY as hard- in like-there are a lot of things to remember with all the irregular verbs and things and like […] the subjunctive and all the stuff you have to learn for the opinion question, but there is not as much to learn as in Irish.
> R: I know wrote that you like Irish and you are good at it?
> Learner A: Yeah, that's right. I do but French and I'm good too- I hope to get a B1 in the mocks[13] but there is not as much learning off.
> Learner L: I know as I was saying like I'm useless at languages. It fries my head […] but French is all right like. It's (X) enough
> R: Why do you say that?
> Learner L: I think there aren't as many different spellings-the word stays the same- I can't get that masculine and feminine stuff
> R: Is that not in Irish as well?
> Learner L (laughs) I don't know.

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[12] Annoy one.

[13] Trial or pre-examinations.

Agreement of noun and adjective in gender and number occurs both in Irish and French, German, Spanish but does not occur in English. It would be expected, therefore, that confronting this feature for the first time in Irish as L2 would facilitate a more holistic and efficient understanding in the L3. This does not appear to be the case in practice, however, according to the contributions of the participants. This is explored further in the next section of this chapter.

9 Commonalities in L3/L3 Learning Experience/Narrative

Learners were asked whether their narrative accounts on language learning in the L2 and L3 shared any points of commonality. A surprising result was the fact that only three of the fifteen participants made cross references to the L2 and L3. There was little evidence of learners using their L2 knowledge or tapping into their L2 intuitions. This does not mean, however, that this metalinguistic knowledge was not present; such knowledge may exist even when learners do not have the capacity to articulate it. When probed further whether learning French, German or Spanish reminded them in any way of learning Irish, the learners exhibit what could be termed surface metalinguistic knowledge that lacked depth of engagement and reflection.

> R: So you made no reference to Irish when you were asked to write your thoughts on what learning French meant to you
> Learner L: No
> R: And why was that?
> Learner L: They are […] they are not the same at all. I […]
> R: So you see no similarity between learning Irish?
> Learner L: Just that they are both languages we must do for the Leaving
> Like…

Learner's M contribution here typified most of the contributions:

> Learner M: Yeah […] maybe o.k. there is a lot of learning off and vocabulary () and stuff like that… and there are irregular verbs to be learned off and stuff

In contrast to this, in the following extract transcript of Learner A reflecting on his/her language narratives, we gain an insight into an awareness of how the experience of learning Irish as an L2 conferred advantage and benefit. It must be stressed, however, that these insights were not initially to the fore in his/her reflections, suggesting to the researcher, that he/she perhaps, had not perhaps previously engaged in any cross-comparative reflection.

> Learner A: Well, as I was saying […] there is […] there is a lot of learning off to do in Irish and French.
> R: O.K., but do you think the experience of going through learning Irish has helped or hindered you in any way at all in learning French?
> Learner A: Yeah maybe ()
> R: How, do you think? Take your time.

Learner A: I suppose the way we went through learning a new language in the () first place helped me. I suppose I don't get too worried about getting to know things that […] things like nouns that are not in English () I mean adjectives and things.
You meet them in Irish and you learn them and that prepares you like for the idea […] for things like that in French. I think it makes you a better learner.

The experience of dealing with difficulties and lack of comprehension in Irish is also seen to confer advantages when approaching the L3. The contribution by learner I in particular reflects a certain inner mindfulness that the experience of language learning in L2 and L3, however different, is also in many respects remarkably similar and beneficial.

Learner I: I kinda survived all the difficulties I had with Irish () I kinda know how to cope now as well in French
R: Do you mean learning off by heart?
Learner I: No, not ONLY that […] but like it kinda prepares you-
R: How is that?
Learner I: I don't know like…you know how to look up words in a dictionary, prepare sentences in your own mind…watch out for grammar and
[…] and spellings like that the structure em of sentences () that are not in
English and that the order […] the order of words is different-it prepares you for what it is like to learn

These two quotations reveal that, for some learners, the process of L2 learning has prepared them, albeit unconsciously, to approach more holistically the learning of the L3. In the context of the present study this is an important finding. The fact, however, that there were few references overall to making metalinguistic connections indicates that learners are not used to making, or are unable to make, engaged and deeper associations apart from surface reflections regarding rote learning and strategic thinking.

10 Discussion and Concluding Comments

This chapter has referred to the fact that research on crosslinguistic influence between Irish and other languages in learners' constellations has been a virtually neglected area of investigation in the Irish context to date. The part that Irish plays in the subsequent learning of L3 requires further exploration, not only for the light that such exploration might shed in general terms on crosslinguistic influence but also for implications that its findings might have for the entire language-teaching enterprise in Ireland. The data presented in this chapter emanating in an uninterrupted manner from the narratives of fifteen learners shows a number of commonalities as far as language learning is concerned. Since the research is based in the secondary school context and during the year of the final examination, as expected, there was predominant emphasis on a rote learning approach to languages. Rote learning, however, can also be an evasive way of reflecting on and mastering difficulties encountered when confronting problems emerging from

language distance e.g. morphological and inflection in Irish as L2. Learners showed an ability to foreground these language difficulties, but exhibited little or no awareness of confronting difficulties which could involve the creation of language awareness that could facilitate and ameliorate the language learning process itself.

There was also a belief that being competent at a language is a *given*, a *fait accompli*. There was little evidence of learners' awareness of their capacity to become more aware of themselves as learners so as to improve their competence and proficiency. There is striking evidence of the lack of not only metalanguage, but also of learners' ability to reflect on the possibility of crosslinguistic awareness and transfer. Research data such as these point to the need to develop language awareness programs advocated primarily in Ireland by David Singleton that focus on learners' profiles and narratives in their endeavours to learn Irish as an L2. Such profiles would help delineate learners' Irish language learning experiences, their acquired and changing Irish skills and their attitudes to Irish in education and society. Thus learning Irish as an L2 represents a very good opportunity to imbue learners with a creative and empowering language awareness to help them to come to terms with how languages other than their L1 work phonologically, morphologically, lexically and syntactically. Evidence from this small study points to the fact that this opportunity is not being exploited to any significant extent at present.

More language awareness activities are necessary, therefore, to help learners to become metalinguistically aware of their developing interlanguage systems and to exploit such systems in their learning of L3s and L4s. As Ó Laoire (2010: 244–245) has pointed out, there has in fact been an unhelpful tradition over the years, more than likely the result of a long established direct method approach in the classroom of refusing to allow learners to use their knowledge of English when learning Irish, thus trying to keep their two store of language knowledge L1 and L2 insulated one from the other, avoiding use of L1 in L2 learning contexts and vetoing overt comparison of the two. The thinking was to prevent linguistic cross-contamination. Thus, learners over the years have had difficulties in conscious efforts at mapping Irish morphosyntax onto English or vice versa. Thus, rather than producing students apparently bereft of language awareness, teaching and learning Irish could do much to foster an excitement and a creative curiosity about all language learning and help them to move beyond the staid 'rehearsal for test' teaching and rote-learning for examinations

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Exploring the Impact of the Proficiency and Typology Factors: Two Cases of Multilingual Learners' L3 Learning

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Abstract The present study examines lexical crosslinguistic influence (CLI) from L1 and L2 in two cases of L3 learning. It focuses on the role of the proficiency level of the background languages and of typological proximity in the activation of the background languages in L3 oral production. Earlier research has shown that both these factors play a role for CLI. Here we aim at further understanding the role of these factors, and how they are related to the proficiency level of the L3. The first case, which will be summarized briefly and used as a point of comparison in this chapter, concerns a Swedish learner of Italian L3, with English, French and Spanish as L2s (Bardel and Lindqvist 2007). The results showed that low-proficiency Spanish L2 was the background language that was most used in the beginning of the acquisition process of Italian, especially in code-switches of function words. High-proficiency French L2 was also used but in a different way, mostly in word construction attempts. Both the proficiency and the typology factor played a role, but their impact varied at different stages of development in the L3. The second case concerns a bilingual Swedish/Italian L1 speaker learning Spanish L3, with English and French as L2s. The data was gathered following the same procedure as in the first study, and consist of three recordings of interviews and retellings. The results indicate that the proficiency and typology factors are decisive for CLI here too, but in slightly different ways as compared to the first case. Italian L1 is used for both code-switches and word construction attempts, suggesting that a high-proficiency language may well be activated for both

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purposes, if it is similar enough to the target language. These results show that further investigation of both factors is necessary for our understanding of their interplay.

1 Introduction

The present study investigates lexical CLI from the first language (L1) and the second language (L2) in two cases of third language (L3) learning: L3 Italian and L3 Spanish. It is a comparison of two beginning learners' acquisition processes in these two languages over a six-month period. The case of the L3 learner of Italian (henceforth Learner 1) has earlier been reported in Bardel and Lindqvist (2007) and is only summarized in the present chapter, in order to serve as a point of comparison for the more recent study of a learner of L3 Spanish (henceforth Learner 2). Many factors that can possibly affect L3 learning have been brought up in the L3 literature. In this chapter, the focus is on the role of the proficiency level of a background language and of typological proximity in the activation of the background languages in L3 oral production. The role of the proficiency level of the L3 will also be discussed, because the two learners' proficiency in the L3 increased during the longitudinal data collection (see Bardel 2005 for the development of verb morphology in the case of Learner 1, and Bardel and Gómez Manzanilla (in progress) for Learner 2). The rationale for choosing to concentrate on precisely these factors is that they proved to be determinant in several ways in Bardel and Lindqvist (2007). In the present study, we compare the role of these factors in two cases where the same languages—Swedish, Italian, Spanish, French and English—are involved, but have different statuses as L1, L2 or L3 (see Sect. 3). The aim is to gain further understanding of the role of these factors in yet another detailed case study. By using the same research design in the two case studies, we hope to be able to show the value of the case study as a method. We believe that case studies can be complementary to each other, if data is gathered in a similar way (see further discussion in Sect. 2.1).

A number of studies examining the role of different factors for lexical CLI in L3 have appeared in the last two decades. Many of these studies have highlighted the role of the proficiency and typology factors. The seminal chapter by Williams and Hammarberg (2009 [1998]) was followed by several contributions in Cenoz et al. (2001, 2003), for instance, and the question as to which factors come into play in L3 learning (e.g. proficiency, recency, typology and the L2 factor) continues to interest researchers. Some recent publications are the contributions in Dewaele and De Angelis (2011), Falk (submitted), and Lindqvist (2010, 2012). The importance of these factors will be discussed in Sect. 2.2.

2 Background

2.1 The Importance of the Case Study in L3 Research

Case studies of second and third language acquisition were common in the 1980s (see e.g. Schmidt and Frota 1986; Singleton 1987; Cohen 1989), but seem to have decreased since. However, there are some exceptions, for example, the case study of Swedish L3 by Williams and Hammarberg (2009 [1998]), which was later compared with another case of Swedish L3 (Hammarberg 2006, 2009), the two cases on Italian L3 reported in De Angelis and Selinker (2001), and the six cases on French L3 in Lindqvist (2009). One may wonder why the number of case studies decreased, since important findings emerged from them. One explanation might be that case studies are time-consuming, as pointed out by Cohen (1989: 147). Much data is needed from one single subject, and data collection normally takes place longitudinally and is therefore quite demanding for the participant. One also needs to acknowledge the limited possibility of conducting replicate studies of single cases, unless the methodology is outlined in detail. And, even if it is, it may be difficult to proceed exactly along the same lines as in previous case studies. One may also have doubts about the possibility of generalizing findings from one single case. However, as Singleton (1987: 329) notes concerning analyses of CLI in one particular learner's oral production, "the detailed investigation of manifestations of transfer in the L2 output of even one learner contributes to the accumulating pool of information in this area and to the associated theoretical debate".

One advantage of case studies is that they provide the opportunity to use introspection and retrospection, which is not easily given in large-scale studies (cf. Singleton 1987; Bardel and Lindqvist 2007). Dealing with transfer questions, the researcher is often unsure about how to interpret output that looks like positive transfer. Also, what looks like negative transfer is not necessarily transfer, but can be common interlanguage structures (Singleton 1999). Furthermore, as pointed out by, for example, Hammarberg (2001: 27), it can be very hazardous to try to decide whether code-switches and word construction attempts take place consciously/voluntarily or not. If the learner carries out a verbal report the chances to understand the processes behind production increase. On the other hand, such reports are subjective, and the learner can unconsciously come to conclusions that do not correspond to reality. The researcher can of course never be quite sure about the trustworthiness of the learner's comments. Questions that arose in Learner 1′s mind during the retrospective activity in Bardel and Lindqvist (2007) reflect this problem. The comments of the learner show that she herself sometimes seemed to hesitate concerning which one of the background languages influenced the L3 on several occasions, as in the following quote (Bardel and Lindqvist 2007: 134):

> I think that I mix up Spanish and Italian sometimes, become unsure whether a word is Spanish although I think it is Italian. (…) When I said *ahora* I was really unsure whether it was Italian or Spanish. Same thing with *simpatico*.

Nevertheless, the uncertainty expressed by the learner in this case is still an interesting testimony of how several languages are dealt with in the multilingual mind. It can be questioned whether the language learner can be used as a linguist in order to describe processes of SLA (cf. Gass and Mackey 2000: 110). In the normal case, the two roles of learner and researcher do not coincide, and it cannot be taken for granted that the learner notices everything that a researcher would find interesting. In Bardel and Lindqvist (2007) the learner *is* a linguist, a fact that, according to our view, could support the validity of the verbal report data. A disadvantage could be that the learner's report may be influenced by the fact that she, as a researcher, knows what is of interest for the research questions, and therefore the retrospection risks to be biased.

In a longitudinal study, one could of course discuss what the effect of the verbalization might be on the successive production, i.e. "whether, and to what extent, the verbalization has an influence on the task performance" (Faerch and Kasper 1987: 18–19). What does it mean that the informant has reflected on the tasks and questions between one recording and another? According to Learner 1's own report, the fact that she had already seen and reflected on the stimulus certainly did influence her production the subsequent time(s). She felt this in particular with the retellings, where she sometimes had the impression of "retelling the retelling" from the time before, and not the actual task stimulus (cartoon/comic strip). However, she did not estimate that it influenced her introspective comments.

On the whole we found in Bardel and Lindqvist (2007) that the retrospective comments contributed in a positive way to our possibilities of interpreting the data. There were some cases, where the researcher would never have been sure about the interpretation without the report of the learner, for example the form 'severe'. Since the adjective 'severo' exists in Italian, only the learner's own report could tell that 'severe' was the result of cross–linguistic consultation. In summary, we find that intro- or retrospection are ideal complements to case studies. Unfortunately, however, in the case of Learner 2 it was not possible to use introspection, due to practical reasons.

2.2 The Role of the L1 and L2 in L3 Learning: What Factors are Decisive for CLI?

As already mentioned, the present study focuses on the role of the proficiency and typology factors for CLI in L3 acquisition, even though other factors have also been brought up in the L3 literature (cf. e.g. De Angelis 2007). Regarding the proficiency factor, several studies have shown that high proficiency in an L2 seems to favour CLI (Schmidt and Frota 1986; Ringbom 2001; Wei 2003;). However, it has also been shown that low proficiency in an L2 can play an important role (De Angelis 2005).

As for proficiency in the target language, results from earlier studies indicate that CLI decreases as proficiency in the target language increases (Singleton 1987; Navés et al. 2005; Muñoz 2006; Lindqvist 2009). However, it can be discussed whether the nature of crosslinguistic influence differs at different levels of acquisition. Most of the cited studies have looked at the early stages of acquisition, where formal transfer, for example code-switches and foreignizings, is common. It may be the case that meaning-based transfer is more common at advanced levels of acquisition, for example in semantic extensions (cf. Ringbom 2007; Lindqvist 2012).

With respect to the typology factor, previous research has found that CLI often occurs from closely related languages (Ringbom 1987; Singleton 1987; De Angelis and Selinker 2001; Singleton and Ò Laoire 2006). Ringbom (2007: 91–92) stresses that crosslinguistic similarity plays an important role at early stages of acquisition. Both learners in the present chapter are at the beginner level, and, as will be shown more in detail below, in Bardel and Lindqvist (2007) it was demonstrated that Learner 1 mainly transferred lexical items from the other Romance languages that she had knowledge of, and especially so in the first recording.

As the present study concerns Romance languages, both as L3, L2, and as an L1 in the case of Learner 2, it is interesting to note what previous research has shown in terms of CLI between Romance languages. In fact, many studies show that a Romance language rather than a non-Romance language is used when the target language is also a Romance language, suggesting that the typology factor plays an important role. In Singleton's (1987) case study, for example, lexical CLI occurred from Spanish L2 rather than English L1 and Irish and Latin L2 in the oral production of learner French. According to the author, this was due to the fact that Spanish is more closely related to French than the other languages. The fact that Spanish was the most dominant transfer source was also discussed in terms of the psychotypology factor, that is, the learner was aware of the similarities between Spanish and French, as well of the relation between the other languages in his repertoire. This emerged from the retrospective comments that were gathered during the data collection process. The typology factor did not seem to play a role in the case of Latin, however. One could have expected that Latin would influence French because of the similarities between these two languages, but it was rarely activated. Instead, English was the most commonly used background language after Spanish. This result is discussed in terms of the proficiency factor. Obviously, the learner was more proficient in his mother tongue than in Latin. Singleton (1987: 334) also notes that "English is itself in large measure a Romance language" and that transfer from this language mainly concerns English/French cognates, thus lending support to the hypothesis that languages that are similar seem to influence each other (even if they are not genetically related). It then seems that both proficiency and structural similarities played a role as regards the role of English in learner French.

In another case study, Lindqvist (2009) found that lexical CLI (code-switches and word construction attempts) occurred from Spanish L1 rather than from Swedish and English L2 in the oral production of French L3. This result was explained by the typological closeness between the two Romance languages Spanish and French. In Singleton and Ò Laoire's study (2006), also on French L3, English L1 was used to a much greater extent than Irish L2 in pupils' written production. The authors interpreted this as an indication of the psychotypology factor being at stake. Even though neither English nor Irish is a Romance language, there are more similarities between English and French than between Irish and French, especially as far as vocabulary is concerned (cf. Singleton and Ò Laoire 2006: 4–5). The results were further confirmed in the introspective data provided by the learners. In fact, almost all the comments in the introspective data referred to English as source language. De Angelis and Selinker (2001) also showed that Romance languages tend to influence each other. The two learners in their study both used a Romance background language when learning Italian. Of particular interest is the result that one of the subjects relied more on Spanish L2 than on French L1 and English L2 when speaking Italian, which the authors explain by the psychotypology factor in the sense that the learner perceived Italian and Spanish to be closer to each other than to French.

3 Methodology

The same methodology was followed in the two cases discussed in the present chapter, and is therefore outlined in one common section, although the results of the two cases will be presented in separate Section. The learners were recorded during semi-guided conversations with a native speaker of the respective language over a 4–6 months' period. The design of the data collection is shown in Table 1.

Tables 2 and 3 show the estimated role of the factors that we are interested in, i.e. proficiency and typology. The same languages are involved in both cases, but, as the tables reveal, they have partly different statuses as L1, L2 and L3. Both learners have Swedish as L1 and English and French as L2s. Learner 2 has a second L1, Italian (see Sect. 6.1. for more detailed information about Learner 2).

Table 1 Data collection

Recording I (beginning of term)	Recording II (mid-term)	Recording III (end of term)	Recording IV (6 months after course, learner 1 only)
Interview with a native speaker of Italian/Spanish	Interview with a native speaker of Italian/Spanish	Interview with a native speaker of Italian/Spanish	Interview with a native speaker of Italian
Retellings: 2 Comic strips	Retellings: 2 Comic strips, 3 Mute video films	Retellings: 2 Comic strips, 3 Mute video films	Retellings: 2 Comic strips, 3 Mute video films

Table 2 Estimated role of the factors (Learner 1)

	L1 Swedish	L2a English	L2b French	L2c Spanish
Proficiency	+	+	+	−
Typology	−	−	+	+

Table 3 Estimated role of the factors (Learner 2)

	L1a Swedish	L1b Italian	L2a English	L2b French
Proficiency	+	+	+ (B2)	− (A2+)
Typology	−	+	−	+

We only look at these two factors in this study, because we found that they were the most crucial ones with respect to Learner 1 (cf. Sect. 4), but it may be the case that other factors are involved too of course. Proficiency is based on self-estimation. Learner 1 had studied both French and English in school and at university level, and was a doctoral student of French at the time of the data collection. She had only studied Spanish for a year in high school, approximately ten years prior to the data collection in Italian. As Table 2 shows, French is the only language that scores high on both factors, in the case of Learner 1.

As for Learner 2, the proficiency level is based on both self-estimation and on the results of standardized placement tests (developed by the Swedish Open University). On the basis of the results of the tests in English and in French, the learner's proficiency level is estimated in accordance with the *CEFR* scale. Table 3 shows that, for Learner 2, Italian is the only language that scores high on both factors.

In the analysis, instances of lexical CLI were divided into two main categories. The first category represents code-switches (words belonging to L1 or L2 that have not been adapted to the TL) as in the following example of a conversation in Spanish between Learner 2 and a native speaker of Spanish:

1. NS: te gusta el francés?
   Do you like French?
   Learner 2: eh sí **ma** es muy difícil
   Eh yes but it's very difficult
   (*ma*: Italian)

The second category was word construction attempts, that is, words from the L1 or L2 that have been adapted morphologically and/or phonologically to the L3 (cf. Williams and Hammarberg 2009 [1998]):

2. Learner 2: y eh: llama el eh: **servitor**
   And he calls the waiter
   (*servitor* is based on the Swedish word *servitör*)

4 A Multilingual Learner's Use of the Background Languages in L3 Italian—A Short Summary of Bardel and Lindqvist (2007)

As already mentioned, this chapter focuses on one learner's oral production of Spanish as L3. This case study is a replicate of an earlier case study on Italian L3. As a point of departure, the results of the previous study are summarized here. Learner 1's L1 was Swedish, and English, French and Spanish were her L2s (cf. Sect. 3). The study showed that the two Romance background languages Spanish and French played an important role as sources of CLI. Spanish L2 was used to a large extent for code-switches (about half of all the code-switches were Spanish), especially in the beginning of the process of learning Italian. This was a rather surprising result, given that Spanish was the learner's weakest L2. However, the number of Spanish code-switches decreased over time. French was also used for code-switches (27 % of all code-switches) and distributed more evenly over time. Swedish and English were less used. In relation to the typology factor, these results were interpreted in the following way. As the Romance background languages were used to a larger extent than the Germanic background languages, it seemed that the proximity between French L2, Spanish L2 and Italian L3 favored CLI. Furthermore, we saw that Spanish L2 was more used than French L2, especially in the first recording. This seemed to indicate that phonological resemblances between a background language and the L3 favored CLI in the competition between two background languages that were closely related to the L3. This interpretation was supported by the fact that almost all instances of code-switches from Spanish were very close to the Italian counterparts as far as pronunciation (and meaning) was concerned. It can be illustrated by examples of Spanish code-switches such as 'treinta' ('thirty'), 'tarde' ('late'), and 'lengua' ('language'), which correspond to Italian 'trenta', 'tardi' and 'lingua'. In relation to the proficiency factor, the results showed that low proficiency Spanish was the most used language; thus, low proficiency in a background language seemed to favor CLI. Moreover, because the number of code-switches decreased over time, that is, as the proficiency level of the L3 increased, we argued that the proficiency level of the L3 conditions CLI. Low proficiency in Spanish L2 in combination with low proficiency in Italian L3 opened up for CLI from Spanish into Italian in the first recording. Then, as the proficiency of Italian L3 increased, there was less room for CLI from Spanish L2. In summary, as for code-switches, we concluded that rudimentary knowledge of both Spanish L2 and Italian L3, coupled with resemblances—especially at the phonological level—between these languages, favored CLI. As for word construction attempts, these were based almost exclusively on French L2 (cf. example 3).

3. Learner 1: e poi hm eh hm mette una un **escar::pa esciarpa**
   And then hm eh hm he puts on a a escarpa esciarpa
   NS: una sciarpa sì # perché una scarpa lo sai cos'è

A scarf yes because a shoe, you know what that is
> Fr. *écharpe.*

As shown above, the results point to an interplay between three factors: the proficiency of the background languages, the proficiency of the target language and the typological relation between background and target language. We could conclude that the use of French L2 as a base for word construction attempts in Italian L3 was due to the typological closeness between French and Italian, and to the high proficiency that the learner possessed in French L2. Of course, Spanish is also closely related to Italian, but it seemed that the learner's proficiency level in Spanish L2 was too low—she simply could not use this language for word construction attempts as her vocabulary was too restricted.

5 Research Questions

With the results of the previous study in mind, we pose the following research questions in the present chapter.

1. Which language is the main source for code-switches on the one hand, and for word construction attempts on the other, in Spanish L3?
2. In relation to the first study, are the same factors decisive for the two types of lexical CLI? Is there a similar kind of interplay between the factors?
3. What are the similarities and differences between these two cases of L3 learning?

6 A Multilingual Learner's Use of the Background Languages in L3 Spanish

6.1 The Learner and her Background Languages

Let us now turn to the case of L3 Spanish. Learner 2 is a bilingual Swedish/Italian speaker. She was 33 years old at the time of the data collection. She grew up in Sweden and has spent most of her time in Sweden, with a Swedish mother and an Italian father. According to her own estimation, she is a balanced bilingual speaker. She regularly uses Italian with her father, with her Italian companion and with Italian friends. She has also lived in Italy for three years, approximately 15 years before the present study began. During her school years, she studied Italian for four years within the Swedish school system, which provides mother tongue tuition for children with parents born outside Sweden. Finally, she also studied Italian at university level, leading to a master's degree. As for her other languages, she

studied French in school for six years and took a one-semester course at the university four years before the data collection. She studied English in school for nine years as a compulsory subject. An overview of the learner's background languages in relation to proficiency and typology is presented in Sect. 3.

6.2 Results and Analysis

Following the same procedure as in the first study on Italian L3, we present the results in terms of number of code-switches (Table 4) and word construction attempts (Table 5), and the background languages that function as sources for these types of CLI.

It is clear that Italian L1 dominates in code-switches (76 % of all instances) as well as in word construction attempts (72 %). Thus, we do not see the same pattern as in Learner 1, where different languages were used for different types of CLI. In fact, in Learner 2's production of Spanish L3, Italian L1 seems to be constantly present, whereas Swedish L1 and English L2 rarely appear (as was also the case in Learner 1). French L2 is completely absent in code-switches as well as in word construction attempts. It is also interesting to note that CLI from Italian does not decrease as proficiency in L3 increases, contrary to what we found in Learner 1. How do we interpret these results in relation to the two factors that we focus on in this chapter? Starting with the proficiency factor, it seems that high proficiency in Italian leads to CLI—both code-switches and word construction attempts—from Italian into Spanish. As for the typology factor the similarities between Italian L1 and Spanish L3 open up for word construction attempts based on Italian, like in example (4), where the learner creates the word 'guidar' on the basis of Italian 'guidare' (target word 'conducir').

Table 4 Code-switches in Spanish L3

Recording	Swedish L1a	Italian L1b	English L2a	French L2b	Unidentified cases
I	3	21	1	—	3
II	2	17	—	—	1
III	1	15	2	—	4
Total	6 (8.5 %)	53 (76 %)	3 (4 %)	0 (0 %)	8 (11 %)

Table 5 Word construction attempts in Spanish L3

Recording	Swedish L1a	Italian L1b	English L2a	French L2b	Unidentified cases
I	2	5	—	—	—
II	—	8	—	—	2
III	—	5	1	—	2
Total	2 (8 %)	18 (72 %)	1 (4 %)	0 (0 %)	4 (16 %)

4. Learner 2: no puedo **guidar**
   I can't drive
   (Based on the Italian word *guidare*)

More precisely, since the other typologically close language French is not used at all here, it seems that, as in the case of the code-switches in Learner 1, phonological resemblances between Italian and Spanish favor CLI in the competition between two background languages that are closely related to the L3. The Italian examples 'mi' (reflexive pronoun), 'corso' ('course'), 'meno' ('minus')[1], 'contro' ('against') are in fact very close to their Spanish counterparts 'me', 'curso', 'menos', 'contra'. A possible explanation as to why French is not used by Learner 2 in word construction attempts is that her proficiency in that language is not very high. A high proficiency in a background language seems to be a condition for the capacity to form new words based on that language, as seen in Bardel and Lindqvist (2007) and in Sect. 4 above.

7 Discussion and Conclusion

Our first research question was: Which language is the main source for code-switches on the one hand, and for word construction attempts on the other, in Spanish L3? As we have just seen, it turned out that the same background language was used in both categories, i.e. Italian L1. This is probably due to the learner's high proficiency level in that language, in the case of the word construction attempts, and to the fact that Italian is phonologically the closest background language to Spanish, in the case of the code-switches. The other Romance language, French, was not at all used by this learner. Thus, even though French is typologically close to Italian, and could therefore be activated, as predicted by the typology factor, this does not happen. This result goes hand in hand with the ones in Singleton (1987), in the sense that the factors high proficiency in a background language and typology play important roles. Singleton's results showed that the learner relied on a closely related background language, as well as a high-proficiency language, which was also relatively closely related to the target language. In our case, the two factors pertain to just one language, Italian L1.

Our second research question was: In relation to the first study, are the same factors decisive for the two types of lexical CLI? We also asked whether there would be a similar kind of interplay between the factors. As for code-switches, there are both differences and similarities, because Learner 1 mainly used a low-proficiency language (Spanish L2), whereas Learner 2 relied on a high-proficiency language (Italian L1), but both used a typologically close language, and, more precisely, the background language which is most similar from the point of view of

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[1] This word is used in the expression 'dos meno diez', meaning 'ten to two'.

pronunciation. Thus, there seems to be interplay between two factors in both cases, but in different ways. Regarding word construction attempts, both learners used a high-proficiency language, which was also typologically close. Thus, it has to be concluded that the same factors play a role, but not in exactly the same way in these two cases.

Our third research question was: What are the similarities and differences between these two cases of L3 learning? As for the similarities, we can conclude that typological closeness plays an important role in both cases, whether the closeness concerns the relation between L1 and L3 or between L2 and L3. Thus, in the case of Learner 1, we have seen that both Romance languages known to the learner, Spanish L2 and French L2, influence Italian L3. And, in the case of Learner 2, it was clear that Italian L1 influences Spanish L3 (but French L2 was not used at all). We have also seen similarities concerning the proficiency level of the background languages. In fact, proficiency seems to play an important role in both case studies, but in slightly different ways. In the case of Learner 1, low proficiency in Spanish L2 seemed to lead to code-switches to this language. In the case of Learner 2, however, high proficiency in Italian L1 favored code-switches to this language. Regarding word construction attempts, high proficiency in the background language seems to be a condition, as both learners used the Romance language in which they are most proficient for this purpose: French L2 (Learner 1) and Italian L1 (Learner 2). Finally, proficiency in L3 played a crucial role in Learner 1, but seemed to make no difference for Learner 2.

On the basis of the two case studies presented in this chapter, it can be concluded that both proficiency in a background language and typological closeness play important roles for the activation of the background languages in L3 oral production. The results clearly showed that both learners used their strongest Romance background language for word construction attempts. Low proficiency in a background language seemed to be particularly determining for code-switches in the beginning of the learning process of the third language in the case of Learner 1. For Learner 2, high proficiency in a background language seemed to lead to code-switches throughout the learning process observed in the present study. The fact that there were some small differences between the two cases show the importance of conducting further case studies in the future, with learners with different combinations of languages, in order to pinpoint the role of proficiency and typology.

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Standard Punctuation
and the Punctuation of the Street

Vivian Cook

Abstract This paper concentrates on grammatical punctuation in written street signs using a methodology derived from linguistic landscape research and writing systems research outlined in Cook (2013). The data come from two inner city streets in Newcastle upon Tyne. After outlining the use of punctuation marks in 'standard' English, the paper describes the punctuation involved in the different functions of street signs: locating signs use little punctuation except for line-breaks; informing signs have either factual information in lists with from-to dashes and or full 'standard' punctuation in announcements; controlling signs have few punctuation marks but a distinctive use of word-initial capital letters; service signs have little grammatical punctuation as they have little structure. The grammar of street signs is largely block grammar noun phrases; their structure is shown more by capital letters and line-breaks than conventional punctuation marks. Overall, street signs show a more sparing use of punctuation marks than 'standard' texts, focussed on highlighting phrase divisions, varying according to the function of the sign. The conclusion is that the punctuation of the street is not deviant, illiterate or misguided but a response to the functional needs of those who write and read it.

1 Introduction

The city streets are alive with written language. It is impossible to walk for a few yards without seeing the numbers of houses, the names of restaurants, for sale signs on buildings, no parking notices, signs for hydrants, posters, and any of a thousand street signs we take for granted every day of city life. The street is a complex public area in which people move, live and have relationships, at the core

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of city life (Jacobs 1961; Hall 2012). This paper discusses the punctuation component of the language of the street, based on the approach developed in Cook (2013), which draws on linguistics, writing system research and linguistic landscape research to analyse the street signs in one urban milieu in relationship to those who create them and those who read them. The paper is an exercise in social semiotics (Scollon and Scollon 2003) focussed on visual signs with linguistic meaning.

Punctuation concerns the visual aspects of a writing system that convey information by symbols other than the letters of the alphabet in sound-based writing systems like English or the characters in meaning-based systems like Chinese. The paucity of research into punctuation means spending some time establishing the facts of English punctuation in general to bring out the unique features of the punctuation of the street. English punctuation has a rich history of prescriptive discussion and analysis, reflected in the perennial popular debates about the 'correctness' of some use of punctuation, such as the so-called greengrocer's apostrophe seen in < Panini's >, found on every street in the land. Yet little modern empirical research has been devoted to punctuation, compared say to the many studies of texting. Indeed most linguistic descriptions of English have ignored punctuation: it is for example mentioned only twice in the 1204 pages of the comprehensive *Longman grammar* (Biber et al. 1999) and is excluded from the frequency accounts for the British National Corpus (Leech 2013). Punctuation is evidently not awarded the status in the description of written grammar that intonation is given in the spoken grammar.

However, virtually all linguistics makes surreptitious use of punctuation. Take any example sentence from a paper on syntax such as:

John said he was looking for a cat, and Bill did too (Chomsky 1995: 126).

This is separated into words by eleven word spaces, marked for class of noun by capitals < John > and < Bill >, divided into two clauses by a comma, and delimited as a sentence by its final full stop, as one can see in its unpunctuated form:

johnsaidhewaslookingforacatandbilldidtoo

Most of the data presented as examples in linguistic papers have been pre-analyzed through punctuation for certain structures and word classes, even those presented in phonetic script - with word divisions.

Cook (2013) looked at all the meaningful signs from two streets in Newcastle upon Tyne, Stowell Street and Leazes Park Road, between March and June 2012, ranging from restaurant fascia boards to manhole covers. The aim was total coverage of one area at one time, in the manner of the classic study of Las Vegas by Venturi, Brown and Izenour (1972/1977). More details of these two streets and of the demography of Newcastle upon Tyne are given in Cook (2013); they are mixed usage inner-city streets of shops, restaurants, pubs and clubs with primarily nineteenth century buildings. The present paper develops one area touched on in that paper, namely punctuation in these street signs in English, i.e. excluding the

bilingual signs. This reduces the total to 296 signs. The omission of bilingual signs is partly because punctuation is to some extent universal in Western writing systems, apart from differences in the form of some punctuation marks (Nunberg 1990: 10), but also because there appears to be little description of it in the Chinese writing system, the main other system represented in our signs.

The conventions followed here are that examples of written language are enclosed in arrow brackets < Hullo! >, examples of spoken language in phonetic script are given in slants /hʌləʊ/ while linguistic examples are given in italics *hullo*. Since the data are visual, many examples have to be reproduced here, the only editing being altering the appearance to enhance legibility on the page. In the examples in the text the typefaces of the letters are approximated but the originals convey them best.

2 The Nature of English Punctuation

Traditionally the nature of punctuation has been interpreted in two parallel ways as rhetorical versus grammatical punctuation (Parkes 1992: 4), called by Cook (2004) *correspondence punctuation* and *grammatical punctuation*:

- *correspondence punctuation*. The overall idea is that punctuation marks correspond to something in the stream of spoken sound. Punctuation marks such as commas < , > and full stops (periods) < . > are claimed to correspond to different lengths of pause in reading aloud. One of the earliest systems was that of Puttenham (1589):

  > (…) the auncient reformers of language, inuented, three maner of pauses (…) The shortest pause or intermission they called comma (…) The second they called colon (…) [which] occupied twice as much time as the comma. The third they called periodus, for a complement or full pause (…).

  This is virtually identical to the advice to be found online today:

  > Where you think a reader should make a major pause (draw breath), use a full stop. Where you think a reader should make a smaller pause, use a comma (…) (Wilson 2007).

  Punctuation marks are also taken to correspond loosely to a few intonation patterns for reading aloud. Typically a question mark < ? > implies low-rise tones for 'yes/no' questions < Are you all right? > and an exclamation mark < ! > implies rise/fall tones < Well! >, while commas may be used for low-rise tones in lists < A, B, C, D >.

- *grammatical punctuation*. Punctuation marks also show the grammatical structure of the sentence. An early account is found in Lowth (1775), an influential though much derided source. While primarily an advocate of correspondence punctuation, he nevertheless stated:

> The period is the whole Sentence, complete in itself, wanting nothing to make a full and perfect sense and not connected in construction with a subsequent Sentence. The Colon, or Member, is a chief constructive part, or greater division, of a Sentence (…) Commas, or Segments (…) are the least constructive parts of a Sentence or Member, in this way of considering it; for the next resolution of it would be into Phrases or Words.

This can be readily transformed into the links between the syntactic rank hierarchy and punctuation presented in Halliday and Mattheisen (2005):

- *sentence*, shown by an initial capital letter and a full stop;
- *subsentence*, marked by a colon, semicolon or comma;
- *word*, bound by spaces;
- *letter*.

> One difference is that clause and phrase are collapsed into a single category of subsentence, rather than using the rank of clause employed in spoken grammar.

We also need to take on board a distinction between *lexical sentences* and *text-sentences* (Nunberg 1990). The lexical sentence used in the spoken language is often described as structurally complete, meaning that it conforms to Bloomfield's (or indeed Lowth's) definition of a sentence as a grammatically independent form (Bloomfield 1933: 170). Biber et al. (1999: 202) prefer the term *independent clause*, defined as "not part of any larger structure but it may contain embedded clauses or be coordinated with clauses on the same level". A text-sentence, however, is a unit "of written text customarily presented as bracketted by a capital letter and a period" (Nunberg 1990), that is to say, it is defined by its punctuation. < The dog bit the man. > is a prototypical example of a lexical sentence, while < The dog. >, < Man. > and < Bit. > are acceptable text-sentences. A text-sentence is then anything bounded by a capital letter and a final punctuation mark, namely < . ! ? >, thus encompassing on the one hand the gargantuan sentences of J. R. Tolkien with many clauses linked with commas, colons and semicolons, and on the other verbless phrases or single words, found for example in Angela Carter's novels (Cook 2004).

According to Halliday (1985), the link between pausing and punctuation marks the common coincidence of phrase structure and tone group boundaries. Support comes from Steinhauer (2003), who showed through ERP measures "[b]oth prosodic boundaries and commas elicit the same brain response reflected by the CPS [Closure Positive Shift]". The rival approaches of correspondence and grammatical punctuation have always had their proponents. The language of the street, however, conveys its meaning entirely through visual means and is not intended to be read aloud; it is quintessentially written language without a spoken equivalent. Traffic signs such as yellow lines on the road surface cannot be read aloud, though they can be paraphrased in speech and in written regulations. Hence the correspondence interpretation of punctuation is not relevant to the language of the street. The rest of this paper deals with punctuation for providing syntactic information in the form of text-sentences and written grammatical units, not spoken ones.

3 English Grammatical Punctuation

To provide a touchstone for the distinctive punctuation of the street, it is necessary to briefly describe the central features of English punctuation, called by Nunberg (1990) *genre-independent punctuation*. These are described in such prescriptive guides as Trask (1997), Carey (1960), Todd (1995) and McCaskill (1998), who provide little empirical support for their pronouncements other than example sentences. This will be called here 'standard' punctuation; it is concerned with language as an abstract entity ruled by authority rather than language as a set of sentences that have been uttered (Cook 2010). The overall issue is how punctuation indicates grammatical units at different levels of the phrase structure of the sentence. Frequency information on punctuation marks will be discussed below.

Table 1 displays a thumbnail sketch of the main links between grammatical units and standard punctuation. This amplifies Holliday's set of punctuation marks with double and single quotation marks < " " ' ' > and adds the use of capital letters and parentheses (brackets) (< ( ) >). Boundary marks occur either at the end of the grammatical unit, for example exclamation marks, or in pairs before and after it, commas and dashes. All punctuation marks are followed by a space before any succeeding text, except for < ' > and hyphen < - >; usage with dashes varies according to the type of dash (en dash < – > and em dash < — >) and their particular uses. Most examples here are quotations from Slavoj Žižek, often from interviews; the remainder are from the sign corpus.

- A *sentence* is delimited by the boundary marks of an initial capital letter and a final full stop, question mark or exclamation mark < . ? ! >:

  <I'm an old fashioned continental European!>

- As Nunberg (1990) points out, this delimits a textual sentence, not the prototypical lexical sentence with a compulsory verb, etc., as seen in the verbless sentences in:

Table 1 English grammar and standard punctuation

Grammatical unit	Boundary marks	Relation marks	Other marks
Sentence	. ! ?		Sentence-initial cap
Clause	, ; :		
Phrase	,		/ for list alternatives
Word	_ (*space*)	–	Word-initial cap for proper nouns
Morpheme		'	
Letter			' . letter omission
Units at any rank	' ' " " –		
Units at any rank			, may replace repeated units
			( ) may enclose units
			, , (paired commas) may enclose units

< Humanity? Yes, it's OK—some great talks, some great arts. Concrete people? No, 99 % are boring idiots.>

- A *finite clause* may be separated from its neighbour by a boundary colon, semicolon, dash or comma < : ; – , >:

  <If you have a good theory, forget about the reality.>

- A *non-finite phrase* can be separated from its neighbour by a boundary dash or comma:

  <Lately we have been doing quite a bit—intervening in foreign countries and destroying the environment.>

  Sometimes the phrase has a pair of marks on both sides, whether commas or dashes:

  <You could say, in a vulgar Freudian way, that I am the unhappy child who escapes into books.>

  The comma, sometimes a stroke </>, is used to separate structurally equivalent items in lists:

  <I am rather perceived as some dark, ominous, plotting, political manipulator, a role I enjoy immensely and like very much.>

  This applies in particular to postal addresses:

  <Churchill Road, Bicester, Oxfordshire, United Kingdom OX26 4XT>

  Another common use is to separate initial adjunct phrases or words from the subject of the sentence:

  <Here, I violently disagree.>

- A *word* is separated from its neighbour by boundary spaces on both sides, here underlined to make them visible:

  <We_know_very_well_some_things,_but_we_don't_really_believe_in_them.>

  A word may be joined to its neighbour by a relational hyphen, yielding a compound word:

  <The re-focus on the perpetrator's traumatic experience enables us to obliterate the entire ethico-political background of the conflict.>

  Words that are proper nouns or adjectives and a small set of other nouns like 'Monday' start with an initial capital letter:

<… apart from left-radical Keynesians like Paul Krugman, with whom I'm sympathetic…>

- Some *morpheme suffixes* are joined to their neighbours by a relational apostrophe:

<Today's racism is precisely this racism of cultural difference.>

- Some omitted *letters* are replaced with an apostrophe:

<I'm an old Hegelian.>

Other abbreviations have a final full stop:

<MR. M.F. LEE BDS>

There are semi-grammatical uses of punctuation that do not relate to the ranks of the sentence, such as quotation marks. In British style, the single quotation mark < ' ' >, in American style, the double quotation mark < " " >, signify distancing the speaker through *oratio recta*, i.e. direct quotation of another person's words, and can enclose any grammatical unit from the sentence down to the word. Quotation within quotation uses the opposite type of quotation mark for the style, i.e. double marks for British style, single for American. 'British' and 'American' are labels for styles that are used globally rather than only in the UK or the USA (Cook 2004):

<'I hate the position of "beautiful soul", which is: "I remain outside, in a safe place; I don't want to dirty my hands."' > (British style quotation marks added).

Similarly a pair of brackets may be used to enclose virtually any grammatical unit:

<What is really hard for us (at least in the West) to accept is that we are reduced to the role of a passive observer …>

As an aside, there are no analogues in spoken language for capital letters, word-spaces, hyphens and apostrophes. These punctuation marks associated with words, morphemes and letters are thus purely grammatical punctuation. Quotation marks are also unique to the written language; as Nunberg (1990) points out, the rare spoken use of 'Quote … Unquote' is very different from the written quotation marks, as is the teachers' stylised gesture of holding up two fingers of both hands and wiggling them, baffling to many students.

Two uses that do not conform to the conventional phrase structure of the sentence. One is the use of < . > as a separator between numbers < 3.147 >, money < £3.14 >, web addresses <www.lmr.co.uk> and times < 13.47 >. This concerns numerical rather than linguistic structure. It needs to be mentioned because of its high frequency in the language of the street for opening times notices, prices etc. It will here be called the numerical stop. The other semi-grammatical use is the dash showing extent from A to B < 1939–1945 > and < Open 9–5 >,

equivalent in meaning to *to*, as spelled out in one sign < Monday to Friday >. Here a punctuation mark has both lexical and grammatical meaning, as described by Nunberg (1990) for colons in sentences like < Man proposes: God disposes. >. It will be called the fromto dash here.

4 The Sign Systems of the Street

The functions of street signs can be roughly divided into four systems (Cook 2013): locating, informing, controlling and service. These will be now be described separately before returning to more general points. The four systems interact with the six roles that people have in relation to signs: licensor, owner, author, writer, addressed reader and unaddressed reader (Cook 2013). This tries to give a broader account of the many relationships of writer and reader than the top-down and bottom-up dimension typically found in linguistic landscapes research (Ben-Rafael et al. 2006).

4.1 Locating Signs

Locating signs identify the street and its buildings indexically, as seen in the signs in Set 1, called by Scollon & Scollon (2003: 146) 'situated semiotics ... any aspect of the meaning that is predicated on the placement of the sign in the material world.' The meanings of locating signs are false, if they are moved to a different location. The number <18> (Fig. 1a) would not be true, if it were lying on the pavement or attached to the house next door. Austin (1962) laid down felicity conditions for performative utterances such as the speaker having the right role, i.e. a judge pronouncing sentence. The felicity conditions for locating signs require not only the right licensor and owner but also the right location. Some signs, like brassplates for businesses, have to be displayed by law in the Companies Regulations (2008). Their readership is passers-by, drivers, postal workers, etc – anyone who needs to know the precise identity of a particular spot. Fig. 1b <BARKER & STONEHOUSE> is a locating sign for a shop, giving nothing but the name, indexical to the building it appears on, made of metal with raised capital letters. Scollon and Scollon (2003: 153) saw this as exophoric reference in which language refers to a particular visible physical object. Fig. 1c <LEAZES PARK RD.> is a typical modern English street sign, with raised capital letters and abbreviated <RD.> with full stop; the physical object to which it refers is then the entire street, presumably extending to the point where a different street-name sign is placed.Grammatical punctuation is virtually absent from locating signs and they have no sentence-final full stops. The word-rank possessive ''s' apostrophe is found, for example in Set 1d < ROSIE'S BAR >, but is often absent, as in < Katherines Florists > and < GREGGS >.

Fig. 1 Set 1: Locating

Fig. 2 Set 2: Locating signs

Many signs simply assert the name or number of the premises, as in Fig. 1-b < BARKER & STONEHOUSE > and Fig. 1a < 18 >. For many, as in Fig. 1b, this is proclaiming not just location but also ownership. This can be called a *Locator*. Most Locators consist of one or more noun phrases with proper nouns, in Fig. 1b connected with ampersand < &>, frequent in street signs. When the Locator is too long to fit on one line, it is divided by line-breaks, as in Fig. 1b, which coincide with word divisions.

A Locator such as Fig. 2a < KING NEPTUNE > can be accompanied by additional information—an *Expander* such as < SEAFOOD & PEKING RES-TAURANT >. An Expander is typically another noun phrase or pair of phrases, separated by a line break from the Locator, such as < A Warm Welcome to All >, below the Locator < ROSIE'S BAR > in Fig. 1d. The line-breaks within a Locator or Expander mostly correspond to grammatical divisions but not neces-sarily. For example, Fig. 2b belies the underlying phrase structure by implying (*kingswalk dental*) (*implant practice*) rather than (*kingswalk (dental implant) practice*). The apostrophe used with plural nouns occurs often in Expanders, as in < Exceptional Florist's >, < Panini's > and < under 7's >. (Perhaps it should be noted that the use of apostrophes with single letters and numbers is advocated by Oxford Dictionaries http://oxforddictionaries.com/words/apostrophe# apostrophes_showing_plurals.) In both Fig. 2a and b the Locator is in 'conser-vative' serif, the Expander in modern sans serif (Cook 2013). Figure 2c also contains an *Identifier* giving an address, whether web address <www.lmr.co.uk>, street address < 50 Leazes Park Road > or phone number < Tel: 0191 236 6622 >. These have specific address punctuation such as numerical stops, commas and colons < Tel: … >. Finally Fig. 1d has a List structure of items for sale < Cask Conditioned Ales … > with no punctuation, to be discussed later.

The visual relationship between Locator, Expander and Identifier is not nec-essarily from top to bottom of the sign. Figure 2c has an Identifier < 58 Leazes Park Road > above a Locator < LMR > and Expander < Recruitment Consul-tants >, followed by more Identifiers such as the phone number. The Locators in Figs. 1d, 2b and c are more prominent by virtue of being larger or bolder or having a more distinctive font, not just by position. The Locator is often all capitals (Figs. 1b, c and 2a) or all lowercase (Fig. 2d) rather than word initial capital letters.

4.2 Informing Signs

Informing signs provide factual information such as opening times, the availability of goods and requests for planning permission. Informing shades into job offers, for sale signs and advertisements, which are perhaps more selling than informing. The intended readership is passers-by, drivers and potential users, that is to say anybody, essentially the ideational metafunction of language for conveying information (Halliday and Mattheisen 2005).

Informing signs divide into two main groups. The first group consists mostly of noun phrases, and only a few finite verbs. Figure 3a is a typical opening times sign with a structured list of phrases separated by line-breaks, no punctuation except for the from/to dash and numerical stops seen in < 7.30am–5.00 pm > and limited use of caps for the start of phrases/lines < Closed >. Its most prominent feature is < Opening times >, which we can call the *Header*, signalled partly by its greater point size and boldness. Figure 3b also has no punctuation apart from a
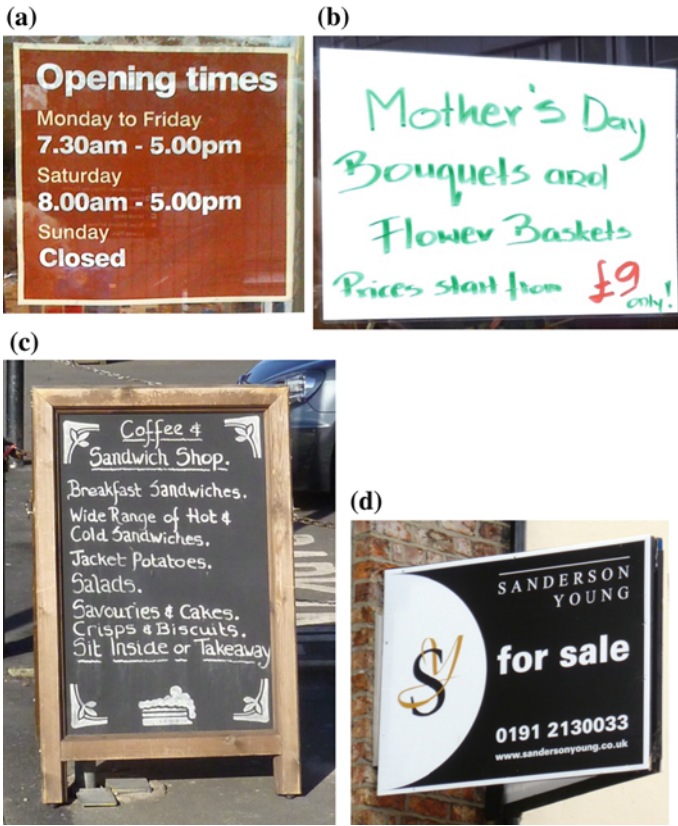
Fig. 3 Set 3: Informing signs

final exclamation mark after the only finite clause and an apostrophe; line breaks mark phrase boundaries; every noun has a word-initial capital letter < Bouquets and Flower Baskets >. The sandwich blackboard on the pavement in Fig. 3c starts with a Header < Coffee & Sandwich Shop. > and continues with a list of items for sale, to be discussed below. Both Fig. 3a and c are left-aligned rather than having the central alignment of the other signs seen so far.

The estate agents' board Fig. 3d has a Header < for sale > in the middle of the sign, all in lower case. A Header is not a heading in that it can occur where the writer chooses rather than at the top of the sign. Figure 3d has an *Identifier* < SANDERSON YOUNG >, which is not indexically linked to the location of the sign and proclaims ownership of the sign rather than of the property. It also has two Identifiers consisting of a phone number and web address.

The second group of informing signs consists of dense texts providing information for readers on foot, mostly owned by the local authority. The job ad in Fig. 4a is left aligned with two sentences, one has a short passive 'wanted', the other two imperative verbs 'call' and 'walk-in', with an unusual hyphenation for

Fig. 4 Set 4: Informing signs

the verb form. A more formal example is seen in the Fig. 4b < Planning Notice >; by law, planning proposals have to be displayed for 21 days near the site (*Development Management Procedure* 2010). Beneath a Header and an Expander, the notice is phrased in full lexical sentences; let us call this an Informer. Figure 4a therefore has only an Informer consisting of two sentences and no Header. While the details are specific to the location, most of the phraseology is laid down by the provisions of the *Development Management Procedure* (2010) in lexical sentences complete with full stops and initial capital letters: though owned by the local authority, planning notices are authored by them to only a limited extent. The readership are interested passersby. These are the only signs in which conventional standard punctuation is used consistently, including clause-final and linking commas. The Header in Fig. 4b is then a large bold < Planning Notice > with an Expander < An application for planning permission … >. Figure 4c is similar, having a Header < paybyphone >, an Expander < the alternative way to pay > and an Informer consisting of a list of bullet-initial phrases < • no more hunting for machines… >.

All of the Informing signs are indexical to their location, apart from posters or other advertisements for widely available products such as Stella Artois lager. Figure 3a announces that *these* premises are open at these times; Fig. 3b and c that these goods are available at *this* location; Fig. 3d that *this* building is for sale; Fig. 4a that a job is available at *this* restaurant. Moving the signs to another location falsifies their meaning. Readership for these informing signs are passersby or drivers potentially interested in the information.

As Kress and Van Leeuwen (1996) point out, the materials that signs are made of contribute to their meaning. Locating signs are permanent and so often made of stone or metal, both for endurance and to create an impression of solidity, for example the large raised metal letters in Fig. 1b < BARKER & STONE-HOUSE > and the sculptured stone letters of < ASPERS CASINO >. Informing signs, however, are often ephemeral, made of paper and written by hand (Fig. 3b) or PC printer (Fig. 4a and b) or done in chalk or paint on blackboards (Fig. 3c). Ephemerality may **also be a matter of temporary** display, whether the estate agents' board nailed to a wall (Fig. 3d) or the planning notice cable-tied to a lamp post (Fig. 4b).

4.3 Controlling Signs

Controlling signs ask or require people to behave in particular ways, whether drivers, pedestrians or customers. This may amount to control of traffic and parking, to warnings against stealing, and to suggestions how to open doors. The responsibility for these varies from traffic signs, licensed and authored by national decree but owned and erected by the local council, to warnings of wet paint put up by individual property owners. They are totally indexical in location and orientation. While Locating signs function as separators marking out boundaries, Controlling signs connect things together (Simmel 1997).

One category is official signs controlling the movement of road-users and pedestrians according to the *Traffic Signs Regulations and General Directions* (2002) [encapsulated in *The Highway Code* (1999)], as in Fig. 5a–d. Signs written on road surfaces have no punctuation, are all in capitals and consist of terse commands like < NO ENTRY > (Fig. 5a) and < ←LOOK LEFT > (Fig. 5b) or even simply of a picture of a bicycle (Fig. 5c). Those intended for road users are written in the elongated Pavement typeface seen in Fig. 5a. The reader's orientation to the message is part of its indexical meaning: < LOOK LEFT > only works from one side of the street and it would be catastrophic if the reader read it upside down from the other side—a classic case of Levinson's relative direction (Levinson 1996) as opposed to the absolute direction seen in the Toronto street sign < PEDESTRIANS CROSS AT SOUTH SIDE ONLY >. Grammatically, these are mostly noun phrases, with the occasional imperative.

The type of controlling sign in Fig. 5d consists of a series of punctuation-free signs (apart from numerical stops for time and fromto dashes), often starting with a

Fig. 5 Set 5: Controlling signs

capital letter < One way >. Division between phrases is by line-break except for
the phrase < Goods vehicles loading only > where it is by word division. Shape
and colour are significant in ways dictated by the Highway Code (1999). Traffic
signs are usually made of metal for permanency. A variation is way-finding signs,
whether owned and erected by the local council for pedestrians, as in the finger-
post seen in Fig. 5e < Eldon Square Shopping Centre…. >, or national traffic
direction schemes administered by the council. Each word has a capital letter,
necessarily as these are place names, and each noun phrase has a line-break. It is
necessary for such signs to be aligned to point to the objects they refer to, i.e. that
the *text vector*, in terms of Scollon and Scollon (2003), corresponds to the direction
of movement.

Other controlling signs are owned by the property owner. Warnings include the
no smoking sign (Fig. 6a), which has to be displayed in all publicly accessible
buildings, the very form, words and language being imposed by law in the *Smoke-
free Regulations* (2006). It also includes a range of signs discouraging parking like
Fig. 6b, and wet paint signs like Fig. 6c. These lack punctuation marks and mostly

Fig. 6 Set 6: Controlling signs
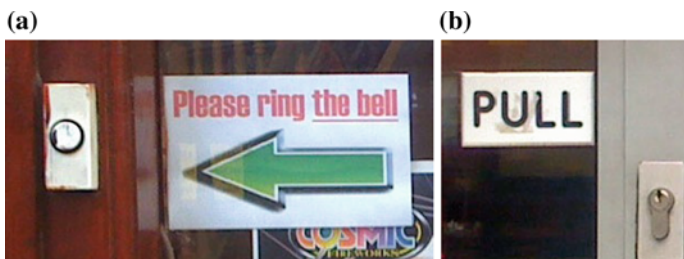

Fig. 7 Set 7: Controlling signs

have linebreaks at word divisions, apart from the no-smoking sign. Other warnings are seen in Fig. 6d < THIEVES WILL BE PROSECUTED >, which seems general moral exhortation—another sign announces < Stolen Plastic cards are not welcome here >. Many warnings are all caps like Fig. 6c and d; some are word-initial caps like Fig. 6b < Disabled Vehicles Only >. Few use capital letters in the same way as the standard punctuation.

Finally there are notices telling one how to press bell-pushes as in Fig. 7-a < Please ring the bell > and open doors as in Fig. 7b < PULL >. These necessarily involve short imperatives, have no punctuation and are often all in caps. They are highly indexical in that their position has to relate appropriately to the actual objects they refer to.

Like informing signs, Controlling signs usually involve a Header, sometime by itself as in Fig. 6c < WET PAINT > or Fig. 7a < PULL >, sometimes a list as

in < Eldon Square… > (Fig. 5e). The Header may have an Expander, as in Fig. 6a < NO SMOKING > and < It is against the law … >. While lists like Fig. 5e are left-aligned, the remaining controlling signs are centred and symmetrical whether the writing on the road (Fig. 5a) or the handwritten warning such as Fig. 6c, apart from balancing an icon in the rectangle (Figs. 5d and 6d). A further characteristic of controlling signs is that they often contain small icons (Peirce 1906), say the person pushing a trolley in Fig. 5d or the one in a wheelchair in Fig. 6b, the capital < M > on Fig. 5c indicating a Metro station or the prohibiting circle with a diagonal line in Fig. 5a, transferred from road traffic signs. Arrows are frequently present as in Figs. 5d and 7b, though the sign itself may point in the right direction, as in Fig. 4e. These are all iconic in that they do not simply represent an object but a meaning attached to an object, which it is up to the reader to deduce—people from outside Newcastle tend to think the < M > stands for the supermarket Morrisons rather than the Newcastle Metro.

4.4 Service Signs

Service signs are put up by providers of services either to tell people that the service is available at this location or to guide specialist workers to the right manhole, etc. They are owned by various specialist companies. Their readership is specialised whether to users of the service or workers for the utility service. On the one hand, there are general services provided for the public on foot such as telephone kiosks (Fig. 8a) and pillarboxes (Fig. 8b). The texts on these are minimal noun phrases—*Telephone* and *Post Office*—together with a list of collection times etc. and appropriate logos such as the royal monograph < VR > (Fig. 8b). The meaning is more in the iconic shape and colouring—the Stowell Street pillarbox in Fig. 8b is in fact a reproduction of a celebrated 1869 Penfold design – than in the actual text. On the other hand, some signs are only intelligible to a specialist reader such as the fire hydrant sign (Fig. 8c) and manhole cover (Fig. 8d). These have fragments of code rather than grammatical units and lexical items of English. If you are a fire-fighter, you will know that the figure < 4 > above the < H > in Fig. 8c gives the diameter of the pipe in inches, the figure < 35 > below states how far away the actual hydrant is in feet. But who knows what lies beneath the manhole cover labelled < CATV > (Fig. 8d)? Apparently the easy deduction that it is cable television does not work as these covers are used by several services. Hence the addressed readership is not the ordinary passerby or driver but a service worker.

The readership for the ubiquitous burglar alarm signs such as < ADT > (Fig. 8e) is more problematic. Partly they announce indexically that *these* premises are fitted with alarms, helpful for insurance purposes and to deter burglars; partly they advertise a service. Grammar and punctuation are more or less irrelevant to service signs as they do not usually have grammatical structures.

Fig. 8 Set 8: Service signs

Other types of signs not dealt with here include monumental signs such as inscriptions on war memorials, graffiti and artworks such as the Invader signs by a French street artist dotted around Newcastle. These genres need separate treatment.

5 The Grammar of the Street

In discussing the language of the street, Cook (2013), following Leech (1966), distinguishes *block grammar*, which lacks articles, etc. from *abbreviated grammar*, which has a wider range of constructions, such as the imperatives *Please ring the bell* (Fig. 7a). Locating signs and service signs necessarily consist mostly of a proper name like *Greggs*. Locating signs always use block grammar for Locators consisting of noun phrases without article as in *King Neptune* (Fig. 2a) and Expanders as in *kingswalk dental implant practice* (Fig. 2b). Hence the presence or absence of an initial capital letter is slight evidence for a word in a Locator being a proper noun. The two groups of informing signs have different grammars.

One group use block noun phrases for Headings and Lists such as *Opening times* (Fig. 3a) and *Savouries & Cakes* (Fig. 3c). The other group have 'full' lexical sentences, whether for jobs (Fig. 4a) or for planning (Fig. 4b) *Please walk-into apply* …. Controlling signs mix noun phrases such as *WET PAINT* (Fig. 6c) with full sentences with imperatives *Please ring the bell* (Fig. 7a) and impersonal prohibitions with full verbs *It is against the law to smoke in these premises* (Fig. 6a). Service signs either have noun phrase Headers *Telephone* (Fig. 8a) or cryptic messages which can barely be called phrases *CATV INTEGRAL SLIDE-OUT B125* (Fig. 8d).

The grammar of the street is highly restricted, mostly consisting of block grammar noun phrases. The occasional lexical sentence is confined to informing signs. What seems crucial is position and prominence rather than linear order. According to Kress and van Leeuwen (1996: 223), "[n]on-linear texts (…) select the elements that can be viewed and present them according to a certain paradigmatic logic, the logic of Centre and Margin or of Given and New, for instance, but leave it to the reader to sequence and connect them". It must not, however, be forgotten that such statements are not as yet backed by objective evidence, such as the use of eye-tracking. Vertical arrangement in lines is undoubtedly crucial, though not necessarily read from top to bottom of the sign. The distinctive grammar of street signs puts rather different demands on the punctuation system. It is marking out nouns and noun phrases that is important rather than distinguishing clauses and sentences.

6 Lists

We can now return to the List structure, which can occur within any of the types of signs. Figure 1d provided a typical List < Cask Conditioned Ales … >—a series of equivalent items detailing what's on offer, consisting of noun phrases marked

Fig. 9 Set 9: Lists

Table 2 Average occurrence per 1000 words

Punctuation mark	Corpus	Ngram	COCA
. full stop	73.6	42.8	47.4
, comma	64.1	n.a.	52.1
" double quote	39.4	10.4	n.a.
' apostrophe/single quote	17.9	4.0	2.11
- hyphen	22.5	2.6	0.87
? question mark	7.4	1.8	3.60
! exclamation mark	5.4	1.0	0.81
; semi-colon	2.8	2.6	1.73
: colon	2.1	4.5	3.02
Total	235.2		

out by a change of colour with each noun having initial caps apart from < spirits >. The division between list items is a line-break with additional leading. Figure 9a shows a more conventional use of commas as a list separator < 2, 3, 4, 5 & 6 >; Fig. 3c uses full stops for the same effect < Jacket Potatoes. Salads. Savouries and Cakes. >; Fig. 4c shows a list separated by bullets < • no more pocketfuls of change >, under the influence of word processing. The list structure in Fig. 9b depends on layout in two columns < Americano Mocha >. In most Lists, like Figs. 1c and 3c, all the nouns have word-initial capitals and the division between items is through line-breaks.

7 Comparing Street Punctuation with Standard Punctuation

We can now compare the overall use of punctuation marks in street signs with the standard punctuation in written English texts. Table 2 gives the frequencies of standard English punctuation marks calculated in three ways. The first column is based on a writing system corpus, some 459 thousand words long. This includes three novels of different types (276 thousand words), selections of articles from two newspapers (55 thousand), one bureaucratic report (94 thousand), and assorted academic papers on language topics (34 thousand). More details are provided on http://homepage.ntlworld.com/vivian.c/Punctuation/PunctFigs.htm. The figures are presented as an average per thousand words of text.

The second column is the Ngram count for the year 2000 *British and American Google Corpus*, again converted to scores out of a thousand words. It does not include commas as these serve as a delimiter in Ngram Viewer and so cannot be counted. The third column is the count for the *Corpus of Contemporary American English* (2013), based on 450 million words. In this case the double quotation mark was not searchable as it appears to be stripped from the search item. A more delicate frequency analysis of commas in the *Wall Street Journal* by Bayraktar

et al. (1998) showed most commas separated 'appositives', items in lists and sentence initial phrases.

It is surprising that there are such differences in the averages between the frequencies for the three samples, given the large size of the Ngram and COCA corpora. The explanations for this we will not develop here, quite possibly attributable to the different ways in which frequency counts for punctuation are made in the three corpora.

The two most frequent marks are full stops and commas. While the different non-grammatical uses of full stops and commas, for example abbreviations and numerical stops, cannot be separated out, clearly these are the major way of showing grammatical units. Next in frequency come double and single quotation marks, again qualified by the inability to tell which of their uses is intended, say relational apostrophe versus closing quotation for $< ' >$. The overall average for our corpus is 235.2 punctuation marks, or 1 for every 4.3 words.

The language of the street, however, has far fewer grammatical punctuation marks. The corpus used here numbered 296 signs. Of these 182 had no punctuation marks other than apostrophes and numerical stops, i.e. 61.5 %. Excluding fromto dashes brought the total of punctuation-free signs up to 196, i.e. 66.2 %. 26 signs (8.7 %) made some use of full stops; excluding numerical stops and abbreviations, the total came to 12 (4.1 %).

Calculating frequencies per 1000 words is hard for our sign corpus since some signs like Fig. 4c have no written text. The total word count came to 3412 words. The total of full stops was 127, yielding an average of 37 per 1000 words, considerably down on the 235.2 for standard texts given in Table 2. Setting aside numerical stops, the total was 41, i.e. an average of 12 per 1000 words. Commas

Table 3 Punctuation in the language of the street

	Standard punctuation	Punctuation of the four types of street sign			
		1 locating	2 informing	3 controlling	4 service
Sentence	Final**. ! ?** Sentence initial cap		. lexical sentences		
Clause	, ; :				
Phrase	, -	Line-break noun phrases	, lists LB noun phrases All Caps/ Lowercase	Line-break noun/ verb phrases	
Word	_ (space)'	Line-break words	Line-break words All caps/word initial caps	Line-break words Word initial caps	All caps
Morpheme	'				
Letter	' .	St.			

occurred 39 times, or 11.43 times per 1000 words, compared to the standard 64.1 times. 18 of these were listing, i.e. 46 % compared to the 20 % found by Bayraktar et al. (1998).

The language of the street thus uses punctuation very sparingly. How then can it convey the necessary grammatical information? To answer this, let us try to capture the punctuation of the street in a similar fashion to the presentation of standard punctuation in Table 1 (see Table 3). Going down the grammatical ranks:

- *marking of sentences* is not needed. Only informing signs use lexical sentences finishing with a full stop and starting with a capital letter. Occasional exclamation marks are found in informing signs with an imperative < BOOK NOW! >; there are no question-marks on any signs. Hence initial capital letters and final punctuation marks are seldom a clue to the beginning of a sentence, caps being used in other ways.
- *marking of clauses* by commas, etc. is absent even from informing signs like Fig. 4c < If you would like to discuss the matter you can phone the officer … >.
- *marking of phrases* is mostly achieved through line-breaks, both between phrases as in < The Gate [line-break] Grey's Monument > (Fig. 5e) and within phrases as in < Fine [line-break] Wines and spirits > (Fig. 1d). As Waller (1990) points out, line-breaks by themselves may be insufficient to be meaningful as they could also be purely arbitrary divisions of text as in Fig. 2b. So line-breaks can be reinforced by bullet points (Fig. 4c) or by change of colour (Fig. 1d). One phrase finishes with an exclamation mark < This weekend only! >. Phrases vary between all capitals < LEAZES PARK RD. > (Fig. 1c) and all lowercase < percy house > (Fig. 2d); a few have phrase-initial caps < Opening times > (Fig. 2a).
- *marking of words* is by space or line-break. Some have word-initial capital letters < Disabled Vehicles Only > (Fig. 6b) and < Available from this Summer > . Unlike standard punctuation, an initial capital letter does not indicate a proper noun, except perhaps in Informing signs. Take for example Fig. 9d with its striking lowercase < t > dotted between the capital letters < StUDENt APARtMENts >.
- *marking of morphemes* is through possessive ''s'. It is nevertheless frequently omitted, as in < Lisas Coffee Shop >.
- *letters*. The full stop is sometimes used for abbreviations as in < LEAZES PARK RD. > but not always—the other end of the street is signposted < LEAZES PARK ROAD >—and in < MR. M.F. LEE BDS >. Another angle is the substitution of punctuation marks for letters in proper-names of shops, which does not occur in our sample but is widespread in shopnames like < sk:n > and < b:zarre > etc., which opens up the whole issue of novel invented spellings that will not be included here. Further examples can be found on http://homepage.ntlworld.com/vivian.c/Punctuation/PunctNovel.htm. The only parallel example is the replacement of < I > by a tooth implant in Fig. 2b.

Table 4 The punctuation of the categories in street sign structure

Category	Grammar	Marks	Other features
Locator	Noun phrases	Line-break	All caps or all lowercase
Header	Noun phrases	Line-break	Boldness
	Verb phrases		
	Imperatives		
Expander	Phrases	Line-break	
Identifier	Phrases	List commas	Word initial caps
Informer	Full sentences	. ,	
List	Noun phrases		

We can now reverse the approach and see how the categories of the structure of signs we have postulated are marked out in various ways: seen in Table 4

- *Locators* state the identity of the property by number (Fig. 1a) or name (Fig. 1b), hence they typically consist of noun phrases. The punctuation is division by word space and line-breaks. Compared to other uses, the letters tend to be either all caps (Fig. 1b) or all lowercase (Fig. 2d).
- *Headers* give the main point of the sign, usually a noun phrase (Fig. 3c), mostly without punctuation other than line-breaks (Fig. 1d). They are similar to Locators in standing out from the rest of the sign in prominence but may be a variety of phrases (Figs. 3d and 5d).
- *Expanders* can be different types of phrase, whether verbless clause (Fig. 1d) or noun phrases (Fig. 2b). Typically they have no punctuation other than line-breaks and are less prominent than the Header or Locator.
- *Identifiers* give additional information such as addresses, web addresses and phone numbers, using address punctuation of commas and numerical dots (Fig. 2c). These may have no punctuation (Fig. 2c), and often have least prominence in appearing at the bottom in smaller font sizes (Fig. 3d).
- *Informers* provide detailed information, mostly through full lexical sentences with initial caps and final full stops (Fig. 4a and b), sometimes bulleted lists (Fig. 4c).
- *Lists* are structures of similar items, punctuated by line-breaks, commas etc. (Fig. 9a and b) and by layout and by change of colour (Fig. 1d).

8 Conclusion

The general paper on the language of the street (Cook 2013) raised a number of issues about the language roles related to signs, the varieties of street sign and the distinctive nature of their language. The present paper has developed punctuation as one aspect of this complex linguistic situation and has shown how punctuation

functions differently in this genre from the 'standard' variety, linked to its different grammar. Punctuation adapts itself to different circumstances and uses new markers such as line-breaks. The punctuation of the street is not deviant, illiterate or misguided; it is a response to the functional needs of those who write and read it.

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The Homunculus in the Multilingual Brain

Kees de Bot

Abstract Wordy, the homunculus in a well-known applied linguist's head, reports on all the work to be done in the multilingual lexicon and on the changes in view on the lexicon over time. He reflects on the old days when the lexicon was still organized according to different languages and laments the demise of the high status of words. He notes that his work is no longer needed when words no longer count as the building block of utterances.

I am the little man in the brain. My career as a homunculus started about 60 years ago. At the time I was very inexperienced, but the work I had to do was simple too. I did some work for my friends in the language areas, and it turned out that I was pretty good at dealing with words, they still call me 'Wordy'. Over time the views on the part of the brain I am part of have changed dramatically and often I long back for the good old days when everything was so much simpler. Whether I really exist, I do not know. Homunculi come into existence when the brain has to do things, like making the body walk, drive a car or speak. How we know what we know is a mystery and I am told that the best minds have tried to solve that problem without success. People are often very negative about us. The will say "But that is a homunculus" as if it is something you would not even touch with gloves. As long as there is no better explanation we do our work. I do not care, I think so I exist!

We refer to the body and brain we are part of as The Master. The division of labor between us and The Master is quite simple. The Master can have intentions, but we decide what really happens! We do not always do what The Master wants and that is sometimes frustrating for him. We try to make life as easy as possible for The Master. Ours is a rather famous applied linguist, the guys from Conscience

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tell me. He likes to talk about language learning, the critical period and the multilingual lexicon, so as soon as I notice that he wants to talk about such topics, I quickly put the words that go with these topics on the first shelf so that they become available as quickly as possible. Some topics he talks about almost all the time, so I leave those words on top of the stack for a while, and some of them remain there for a long time. The Master also likes to talk about women, so when he starts doing that I quickly gather all the woman words, like body parts, make up, pretty face, multiple relations and the like. Unfortunately, it happens quite often that the Master talks about women while he also drinks alcohol. Alcohol is bad for us, we get lost easily in the brain and sometimes I punish the Master by not giving him the right words, holding them up for a while and then releasing them all at the same time. Awesome!

I am in charge of the words, I store them in the right place and get them out when needed. Words are a bit like LEGO, they consist of different parts that are combined. When they first knock on my door, words are still simple, just a part for the meaning and a part for the form. They grow with use. In the beginning they are tiny little structures, and I sometimes overlook them, they are so small I overlook them when I hastily gather the words in need for a conversation or for reading. But every time a word is used it becomes bigger and more complex. For example: an early word is 'dog'. At first it is a sound that is linked to a specific something, like the neighbors' dog. But then it starts to grow: the sound of 'dog' appears to go with different living things with four legs, and its meaning expands all the time. Dogs do things, like bark, bite and shit, they can be big or small, have different colors, they look cute or mean and so on. We do not have separate shelves for Big Dogs or Mean Dogs, we just have a Dog shelve and if needed we just add a word, like big or mean. But sometimes it gets annoying to have to pick up two words all the time and then it is easier to have a dedicated shelve for words combined. Like: 'That's a sweet dog'. Some people with dogs seem to say that every two minutes, so it is handy to have that thing ready rather than reassemble it every time. My Master also has such combined words like 'applied linguistics', or 'Trinity College', or 'content-based instruction'.

In a way, it is easier to speak words than to understand them. For speaking, I know what words to take from the stacks, I know my words very well and can find them easily. With listening it is more complicated. When the first part of a word arrives, I collect all the words that match that part. As more information arrives, many words no longer fit so I end up with a shortlist of candidates swiftly till the one matching word remains. Sometimes they play nasty tricks on me, in particular when running experiments. Then words are presented that do not exist really but they look like real words so I do my best to find a match, but end up with nothing. That really wears me out, running around trying to find the right words and then there is nothing! The other annoying thing is that words do not come in nicely separated from other words, so I will get 'Suchniceweathertoday' and then it is up to me to take that apart and get the words out so I can store them properly. In the beginning, I really had problems with that since I did not know all the words, I would hear 'suchni' and 'sweather' rather than 'such nice weather'. In all those

60 years of my career I do not think I have ever heard two words that were exactly the same. Different speakers, different contexts, different types of noise, different rooms, if you really listen carefully you notice that even simple words like street' sound somewhat different every time. Did you ever think about how this is done? That is my work! Over the years I have learned to classify words. 'Bat' and 'bad' are quite different of course, but there are many ways of saying words that are somewhere between these two. I can say within a blink of the eye whether a word is more of a 'bat' word or a 'bad' word. But of course I get into trouble sometimes as well. In particular with words in another language I do not know exactly how words sound and what the difference between words is.

For speaking I deliver my words nice and clean, without the dirt of other words at the beginning or the end. But then you should see how the guys from Production mistreat my words, they'll just merge them with other words, leave out parts or add things. Sometimes I wonder whether I should spend so much time and energy in cleaning up the words every time when in practice they get dirty right after I deliver them!

We have different kinds of words. We have all the words used stored with the context in which they were used, and if it refers to objects how they look. So I have a big drawer full of different 'tables', wooden ones, stone ones, Irish ones, and one particularly beautiful French one, seen in a Chateau on the banks of the river Loire. I am really attached to that one. But of course I have to come up with the right table when that word is needed. I cannot bring out my beautiful French one when it applies to a pub in Dublin! Sometimes it does not really matter what table to use. For instance, when the Master wants to say: "There are many chairs and tables in the room", I do not take out a specific table. I assembled a sort of all-purpose table that has characteristics of all possible chairs, but is not one particular table. You could call it a generic table that works perfectly on many occasions and is much easier to handle. I only do that when there are many exemplars that are sufficiently similar, yet different. It is quite some work to compare e.g. all the cathedrals we have ever encountered to assemble a generic cathedral out of that, hardly worth the trouble. It works well for concrete words like table and house, less so for abstract words like love and trust. You do not see 'love' like you see a table, so it is hard to say what makes a generic love. Maybe the Master should have more 'loves' for me to know how to combine them?

Sometimes when the Master is asleep we go to the Cartesian Theater to look at the movies in his head. When it is really quiet, we take a little break. I happened to have a nice place not too far from the Corpus Collosum where you can nicely watch all the traffic between the hemispheres. We just sit there and enjoy the view. But we never are off duty for long, because the master sometimes even talks in his sleep. I do not like that, the words all become disorganized and jumbled up, and then I can do all the cleaning up again afterwards.

When the Master was young, things were easy. We had a nice little English library set up, with all the words organized like in a dictionary. Things got complicated when Master started learning French. For a while I would store the words from the new language in the same bins as the English words, it was not that

difficult to keep the words from the two languages apart, English words are kind of greenish grey, while French words are more pinkish blue. But then he wanted to use words from both languages mixed. In some situations, he wanted a 50/50 % mix of the two languages, which gave me quite some headaches, because I had to keep track of what language words came from. Some words are the same in two languages and given the limited storage space I have for my words, it seemed logical to have three bins, one for English, one for French and one for words that were similar in the two languages, so that is what I did. But still, we ran out of space with all these new words when the Master became more fluent. So I decided to rent some additional space in the Right Hemisphere. I was told that they had space to share, so I moved the French words there, that was convenient: when the Master used English I would be in the left hemisphere office, and for French I would go to that right hemisphere.

I cannot say I fancied going to the Right Hemisphere, in the Left Hemisphere everything seems to be better organized, everyone knows what to do, while on the other side it is more messy. They are doing more or less he same there as we do, but not so neatly arranged, more artistic, so to speak. So I was very glad to take my French words back to the old place. It turned out that with more languages you can also create more space. More cells are added through learning new words.

While I was quite comfortable with this arrangement, I was told that this system is old-fashioned. Having words stored in bins in isolation apparently was not the best way to work. A new system was put in place in which words were no longer isolated units, but parts of a network. So when words came in, I had to connect them with cables with words they came with. So when 'doctor' came in and right after that 'nurse' I had to link the two with cables. So words that came in together were linked together. As you can imagine, that was quite a change for me: rather than the nicely alphabetically stored words I now had to set up all these networks, like a wine drinking network with all the words for tasting and grape varieties, or an Ireland network with all the Ireland words linked up. Some words are used a lot together so I make the cable between them thicker. Some other words are only used rarely and when they are not used for a while a disconnect them, I only have a limited number of cables so I have to be careful in using them. Words from different languages also typically appear together, so I now also have nice English and French networks.

Recent developments have put me in an identity crisis. I used to see words as solitary units, but now it turns out that they consist of different parts, one for the meaning, and one for the form of words. While the two parts are connected, finding one does not necessarily mean finding the other. Tip-of-the-tongue phenomena they call this. But basically it means that I am not doing my job properly. It is just too much for a single homunculus to deal with. Different languages, different networks, word meanings, word forms. It is more than I can take.

But the worst is yet to come. I always assumed that words were there, they had a meaning and a form and they fitted in specific syntactic patterns. A bit like a book in the library, when you need, you take it out, read it and put it back on the shelves. The book remains the same, it has no life of its own. Now they tell me that

using a word means changing it. So the book changes because you read it. What a ghastly idea! How do I know where to put it back when a word changes all the time? If The Master wants to say something, how do I find the right words when they move around all the time? It seems that they change because of the friends they hang out with. Let me give you an example. In the old days the word 'house' just had a simple meaning, something with a roof people live in. Of course there were many different houses that also had names, like villas or lodges, but basically they mean the same. Then some guys started making music in the Warehouse in Chicago, and called their music 'house'. People started using the term for different kinds of music, some used 'techno', others 'garage' all different forms of 'house', but nothing to do with the original meaning. For some people, 'house' is now primarily music and not something to live in. I find that confusing, maybe I am getting too old to deal with all these changes. Luckily, The Master is not into house music, he sticks with more traditional pop music as played by his son's band. Maybe he is also getting too old for house music.

What is even more astonishing is that words have began to have a will of their own. In the past they would simply make themselves available when asked. So when I selected a word like 'commit', it would be there, no complaints. It was up to me to combine it with other words, like 'suicide' or 'a crime'. I know that these words go together well, I have done that very often. But nowadays words even tend to refuse service when they are not allowed to bring a trusted friend. So 'gorgeous' wants to be used now with 'meal' or 'look' but not with 'car' or 'book'. I still try to make them listen to me, but in particular the younger words are very disobedient, they prefer to group together rather than stand on their own. Instead of stand for their own meaning, they hide in chunks, they let themselves being carried away rather than do their work by themselves. They become lazy, it is easier to act with others than to do the work yourself, it seems. Now I have to store all these long chunks. You think they fit in my old bins? Forget it. I have to make space for them and treat them as single words. Chunks are arrogant, they think they are better than single words, but I always tell them to be humble: words will still be there when all those fashionable chunks are long dead and forgotten. But some words really suffer and have an identity crisis. Let me give you another example: 'Church' is one of my oldest words, and a well respected one too. The word refers to specific buildings or religions. People used to go to church on Sundays. We always enjoyed that because for an hour or two they would hear only Latin which they did not know, so we had nothing to do. Now going to church means something different. It seems to refer to houses of ill repute where there is good wine and bad women. I also recently had to deal with "Well, I am out, Church!" Meaning something like 'goodbye'. Not to mention all the meanings associated with leaving the church. So I really had to care for 'church', telling her that she had still retained her prototypical meaning and that all these other unpleasant meanings would go away at some point. But inwardly I am not so sure that this is true. Remember what happened to 'weed'. Used to be the name of a plant without flowers that grows in water, but who nowadays thinks of anything else but Cannabis when using the word 'weed'? 'Weed' will never recover from this, I am afraid.

Recently, the Master started learning a new language, Hungarian this time. As far as I am concerned, he might have chosen something simple, but who am I, I am only a servant. But I have to deal with all these really foreign words. Take 'adultery', in French 'adultère', simple enough I can store them together, but then in Hungarian: 'házasságtörés'! That will be difficult to store for me, no links with anything I have here! The Master is getting old and so am I, we have problems picking up all those new words and maintaining them. It is hard work for both of us. The guys from Memory are of little help nowadays, all they do is complain that things get forgotten all the time. Even names of familiar people!

Now it looks like I will retire soon. The newest trend seems to be that there are no words at all in the brain and no lexicon neither. Have they gone crazy? What have I been doing all the time, picking my nose or something? They talk about 'input/output loops' and 'verbal routines', not about words stored nicely in a memory. They say there is no proof for words in the brain, well I can tell you that there are! But maybe I am wrong and was all my doing for nothing. I just thought I was doing the right thing. I am quite sure the Master was happy with me all those years, but now he has to go with the flow. If he would say: "For my words I still rely on my faithful Wordy!", he would make a fool of himself, people would laugh at him because he is 'old school' or something. I do not want to embarrass the Master, we had a good life together; now it is time for me to go. The neural network boys are eager to take over, it looks like they know what they are doing, so maybe I should not worry too much. But this in not the end of my career as I envisioned it, to be honest.

Well, thanks for listening to an old Humunculus, I am sure you will enjoy the work of my successors. And if you need me, you know where to find me! Homunculi do not die, they just fade away!

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