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The Role of Age in Second Language Development

David Singleton^{1*}, Justyna Leńniewska²

¹Fellow Emeritus, CLCS, Trinity College, Dublin, Ireland

²Institute of English Studies, Jagiellonian University, Kraków, Poland

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Abstract

This article delves into the ongoing debate surrounding the role of age in second language acquisition, examining developments over the past three decades and highlighting contentious issues. We argue that the commonly held belief in age's pivotal role is frequently contradicted by empirical evidence. Additionally, we examine the age-related debate with respect to foreign language teaching. A brief review is provided on advances in neuroscientific techniques, which show that the adult brain retains substantial plasticity for language learning, followed by a discussion of these findings in relation to lifelong language learning. Finally, we turn to Complex Dynamic Systems Theory, which offers a dynamic perspective that emphasizes the evolving interplay of age, context, and individual factors, pointing to the need for more qualitative research.

Keywords: *The Age Factor in L2 Acquisition, Age and Language Learning, Starting Age of Language Instruction, Critical Period Hypothesis (CPH)*

Introduction

The age factor in second language acquisition has never been a central point of interest for Diane Larsen-Freeman; however, she did make some important contributions to this area in the early years of her career. For example, in 1991 she produced a very widely used book with the late Michael Long containing a very erudite and substantial section on this topic, entitled “Age” (Larsen-Freeman & Long, 1991: 274-294), in which the line taken was broadly that unless second language acquisition gets under way in childhood, there is no hope of the acquirer consistently attaining native-like proficiency in the language in question, whereas, if it begins in childhood, consistent native-like proficiency is achievable. It was a controversial view at the time; however, little did anyone expect that some thirty years later the issue of the role played by age would still be a matter of a lively debate. In this article we explore some of the shifts and advancements that have taken place in the last three decades, outlining the main issues generating controversy, and showing that we are – regrettably – no closer to any simple answer

* Corresponding author.

E-mail address: dsnglton@tcd.ie

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as to the role of age in second language acquisition than we were thirty ago. We argue that the widespread belief in the crucial role of age is not only not supported, but often countered by empirical findings. We then look at the impact of the age debate on the situation in foreign language teaching. Lastly, we discuss the importance of reconsidering the role of age in L2 acquisition for language learning in a lifelong perspective. Here, we are aided by a theoretical framework that Diane Larsen-Freeman has been instrumental in developing in the more recent years of her scholarly activity: Complex Dynamic Systems Theory.

The Notion of a Privileged Period for Language Acquisition

We seem to get everyday evidence of a favoured period for language learning from the way in which immigrant children very frequently adopt the role of interpreters of the language of the host country for their parents. This phenomenon has been noted (and often discussed at length) for a very considerable period of time. For example, nearly a century ago, in 1925, the British psychologist J.S. Tomb considered the language-use patterns of British families living in India in the days of the Raj, commenting on the very much greater proficiency attained by the children in the various Indian languages as compared with the adults. We need to take into consideration in this context, of course, the fact that the children in question had vastly more contact and interaction with the Indian house-staff and their languages than their parents. This is the usual pattern with children who come to be resident in a place where the dominant language differs from their parents' language; such children tend to become more quickly, more thoroughly and more deeply embedded in the host community than their parents. Note that this is not, or not simply, a matter of age differences: a large range and number of interactional, social and motivational factors need to be taken into account alongside maturation. Often, it appears, these interactional, social and motivational factors seem to be prime. Despite this, psychologists and second language researchers have often pinpointed the age differences as the real reason for cases such as the one addressed by Tomb.

One of the reasons why, since the mid-20th century, there has been a lot of readiness to attribute such phenomena primarily to age is the ongoing popularity of the Critical Period Hypothesis (CPH) and its various mutations. An idea dating from the 1950s suggested that, as childhood moved towards its finale, neurological changes began to occur which precluded the subsequent complete mastery of additional languages. Thus, Penfield claimed that the optimal period for language acquisition terminated when, towards the end of the first decade of life, the brain started to lose its plasticity: "for the purposes of learning languages, the human brain becomes increasingly stiff and rigid after the age of nine" (Penfield & Roberts, 1959: 236). However, the current scholarly consensus in this sphere is that the brain may be modified by experience at any point in life, as it retains its plasticity (Gutchess, 2014; Ramírez Gómez, 2017; Raz & Lindenberger, 2013). Accordingly, Penfield's claim that post-childhood learning of new languages is "unphysiological" is very much under a cloud.

Citing with broad approval Penfield's view of an age-related, physiologically based diminution in language acquiring capacity, Lenneberg – another key figure in the CPH debate – spoke of a "critical period" for language acquisition which ends at puberty. Later in life, in his words, "the incidence of 'language-learning-blocks' rapidly increases," "foreign languages have to be ... learned through a conscious and labored effort," and "[f]oreign accents cannot be overcome easily" (1967: 176). He ascribed such alleged problems to the lateralization of

language functions, that is, the process of their gradual relegation to one of the hemispheres of the brain (usually the left one), which he claimed lasted till puberty. Neuroscientists no longer go along with Lenneberg's version of this process. Current research indicates that lateralization and age are related in a complex and multi-faceted way (see e.g. Nenert et al., 2017). However, at the time, Lenneberg's suggestion that puberty is the "critical age" proved very influential and contributed to the widespread belief that one loses the ability to learn a language properly in one's early to mid- teens.

The Naturalistic Evidence

The empirical support for the maturational approach concerning the acquisition of additional languages has predominantly been drawn from immigrant and naturalistic studies (e.g., Asher & Garcia, 1969; Hyltenstam, 1992; Piske et al., 2002; Seliger et al., 1975). These studies have consistently demonstrated that individuals who arrive in a country with a dominant language different from their home language at a younger age are more likely, over time, to be considered as having native-like command of the new language compared to those who arrive at an older age. However, it is crucial to emphasize, as previously mentioned, that maturation is not the sole determining factor in this context (see Cook & Singleton 2014, Chapter 2). The immigrant's relationship with the new language cannot be comprehensively understood merely by considering age as a single determinant. There are notable distinctions between younger and older immigrants concerning their initial resources and various facets of their lives. These disparities can be attributed to the varying developmental stages of their linguistic and cultural identity, which, in turn, affect their willingness to form connections with different groups. For instance, a study by Jia and Aaronson (2003) demonstrated that among their immigrant participants, children tend to have more exposure to contexts where the host country's language (L2) is used and form a larger number of friendships with L2-speaking individuals. Conversely, adolescents tend to gravitate towards peers who speak their native language (L1). It is common knowledge also that older immigrants often take up work in the same sectors of the economy as their compatriots, who have arrived before them, and as a result the L1 often remains the main language of communication at work. It is utterly unrealistic to expect such differences not to have a substantial influence on immigrants' proficiency in the language of the host country and on the significance of this language in their lives.

Flege (2019) argues against the common assumption that residing in a place for a longer period of time naturally leads to more exposure. Immigrants might spend years engaging with a primarily native language environment or communicating with other immigrants who speak the second language with accents or in an otherwise non-native manner. Socioeconomic status is likely to play a role here (see, e.g., Huang et al., 2018), as is motivation, attention, and a supportive environment (Marinova-Todd et al., 2000). As we can see, the generally negative relationship between age and ultimate achievement in naturalistic language learning cannot be taken to be a result of just the biological age of the learners, because it is impossible to separate age from a vast array of factors that accompany it. As accounts of language acquisition over the lifespan show growing recognition of influences other than physical maturation, the age factor is increasingly being labelled a 'macrovariable' (Flege et al., 1999; cf. Birdsong, 2018).

At the same time, while such factors related to the developmental stages of life clearly favour younger arrivals in terms of L2 acquisition, it is important to emphasize that not all

immigrants arriving in childhood acquire a perfect command of the host country language. Contrariwise, not all immigrants who arrive later in life systematically fail to attain the language proficiency levels achieved by those who arrive earlier.

In this context, it may be pertinent to mention a study conducted by Kinsella and Singleton (2014) which examined a group of 20 L1 English speakers with an average age of significant exposure to French at 28.6 years. These individuals all resided in France and reported being mistaken at times for native French speakers. In the study, both these participants and a control group of native French speakers were tasked with identifying various regional French accents and completing tests on lexis and grammar. Notably, three out of the twenty participants achieved scores within the range of native speakers on all tasks, even outperforming many native speakers in recognizing different accents. This is reminiscent of Marinova-Todd's (2003) findings, which indicated that the most proficient individuals in her group of 30 post-pubertal English learners were those who cohabited with native English speakers. These individuals attained native-level proficiency across all evaluated domains, including accent, in spontaneous speech.

Interestingly, instances of native-like attainment in late L2 learners are documented also in studies which on the whole provide support for the CPH (such as Dollmann et al., 2020). Even though this is a common finding (for many other studies see, e.g., Muñoz & Singleton, 2011), it has not been sufficient to refute the maturational hypothesis for its most dedicated supporters (e.g., Abrahamsson & Hyltenstam, 2009; Long, 2013). For such stalwarts, the only admissible criterion for falsification would be 'scrutinized native-likeness' (Abrahamsson & Hyltenstam, 2009) with regard to all linguistic features in the later learner. Birdsong (2014: 47) responds that, because of the interplay between an L2 user's languages, "nonnativelikeness will eventually be found" – so that, if "scrutinized native-likeness" is the operative criterion, the maturational hypothesis, like the existence of fairies, is immune to disproof. This, however, does not mean that it is true.

It is worth noting that in one specific dimension some notable proponents of the CPH (e.g., DeKeyser, 2003; Johnson & Newport, 1989) have allowed that the critical period for language is of no significance. The situation in question is that of language learning in educational contexts. The reasons these researchers give for this view is their recognition of the essential difference between the experience of formal education from the process of naturalistic language acquisition.

The Search for Threshold Effects

Finally, one more reason why the pieces of what we know about the role of age in L2 acquisition just will not fit together to form a coherent picture is the lack of clarity concerning the effects of learning taking place outside of the hypothetical maturational window for language acquisition, as well as a vast range of proposed onsets and offsets for this window. There is no consensus in the literature as to the expected observable phenomena which would result from a "critical period." One possibility, which has already been mentioned, is that of language acquisition always being in some ways incomplete if it takes place (or begins) after the window closes. As has already been said, counterexamples to this postulated rule have been documented in many studies. Much of the discussion centres around predicted thresholds or discontinuities in the relationship between the level of ultimate L2 attainment and the age at

which acquisition begins. With ordinary ageing effects, one would expect a gradual decline, whereas with a threshold, one would expect a discontinuity of some sort, a reflection of the closing of the maturational window.

As far as cut-off points are concerned, while most studies point in this respect to either the beginning or the end of puberty (which already covers quite a wide spectrum of age), recent studies diverge from puberty in both directions. For example, Dollman et al. (2020), who focused on pronunciation, found a maturational effect at the age of nine, while a recent “big-data” study (Hartshorne et al., 2018, Chen and Hartshorne 2021), in which over a million respondents gave answers to a grammaticality judgment test of English syntax, found a sudden drop in the learning rate for L2 syntax close to the age of 18 years. This is practically adulthood – and, as a threshold, contrasts sharply with findings from some studies on speech perception, in which subtle maturational effects on the ability to distinguish between phonemes were observed already before the age of four (e.g., Sebastián-Gallés et al., 2005). One might be tempted to speculate that the development of different aspects of language may be constrained by different maturational windows; however, even within the same language domain there is large variability of the proposed ages, and numerous contradictory findings (see, e.g., Singleton, 2005; for a discussion of age-related effects on speech perception, see Leśniewska & Singleton, forthcoming). As Birdsong (2018) argues, at the moment there is little potential for the development of a unified, coherent model incorporating multiple critical periods. This is not to say that language learning does not change with age, of course, but unless we see much more convincing evidence about specific cut-off points or thresholds, we should simply assume that language acquisition, like everything else, is affected by general aging processes.

The Evidence from Classroom Contexts

In the mid-twentieth century, under the influence of powerful enthusiasts for early L2 instruction in the school curriculum – such as Penfield – a trend began to lower the starting age of institutional foreign language learning. This trend, which started fairly gradually, more recently has accelerated dramatically the world over (see e.g., Murphy 2014; Singleton & Flynn, forthcoming), seemingly flying in the face of empirical research, which for decades has found that pupils who are taught a foreign language at primary school do not in the long run maintain the advantage of their early start (see Pfenninger & Singleton, 2017; Singleton & Leśniewska, 2021). Already in the 1970s, studies were conducted (e.g, Burstall, 1975; Carroll, 1975) which did not find in favour of the capacity of early instruction to deliver higher proficiency levels than later instruction. This has been the consistent finding since. Later beginners, despite less learning time, prove in the long run to be equal or superior to earlier beginners across a range of measures (see Muñoz & Singleton, 2011). Even in immersion situations it was found that older immersion learners were as successful as younger learners in shorter time periods (e.g, Swain & Lapkin, 1989; Turnbull, Lapkin, Hart, & Swain, 1998; cf. Pfenninger & Singleton, 2019a).

Advocates of the CPH have, on the whole, acknowledged such evidence demonstrating the failure of early L2 instruction to yield the anticipated advantages over later L2 instruction. Thus, for example, two very oft-cited CPH advocates, Johnson and Newport took the position that “the learning which occurs in the formal language classroom may be unlike the learning which occurs during [naturalistic] immersion, such that early instruction does not necessarily

have the advantage for ultimate performance that is held by early [naturalistic] immersion” (Johnson & Newport, 1989: 81). Another CPH champion, DeKeyser, concurs, taking school-based L2 learning to be typically explicit in nature and largely unaffected by maturational constraints: “[r]ather than suggesting the importance of starting early, [age differences] indicate that the instructional approach should be different depending on age” (DeKeyser, 2003: 335).

Despite the fact that disappointing outcomes of early-start L2 instruction are seen as having no bearing on the validity of the CPH, ironically, the CPH has been hugely influential in shaping the educational policies of the great number of countries which decided to begin L2 teaching earlier. The widespread adoption of this policy, and the resulting changes to school curricula, especially with respect to English as a foreign language, have resulted in an unprecedented occasion to compare two generations of learners. As a result, recent years saw several large-scale studies which were able to compare the outcomes for students who started L2 education at different points in their lives. Contrary to expectations, these studies failed to demonstrate any advantage for learners who started FL instruction earlier. For example, Pfenninger and Singleton (2017), Jaekel et al. (2017) and Baumert et al. (2020) did not find any advantage for early-start learners. Pfenninger and Singleton (2017) analysed cross-sectional and longitudinal data from over 200 Swiss learners of English as a third or fourth language. They examined various factors such as learners’ experience, contexts, attitudes, orientations, as well as the correlation between their first language (L1) proficiency and proficiency in the target language. Their findings showed that students who began learning English at the start of secondary school performed better than those who started in the third grade of primary school across all areas. Similarly, Jaekel et al. (2017) and Baumert et al. (2020), who conducted studies with German learners of English, also failed to observe greater improvements for early starters. Baumert et al. (2020) found that the advantage gained by students who started learning English in elementary school diminished over time, which led them to conclude that there was “no evidence for the expected positive effects of early-start English” after 5 years of English instruction at the secondary level. Jaekel et al. (2017) found that an early start actually placed learners at a disadvantage.

Earlier studies on early second language instruction and its outcomes have been reviewed by Huang (2016) in a thorough synthesis of empirical research. The analysis, which includes articles published in English between 1964 and 2014, reveals that the majority of studies found no advantage for younger learners or indicated an advantage for older learners. Older learners generally performed better or equally well, although some studies showed evidence of younger learners catching up over time. Overall, the synthesis indicates that there is minimal empirical evidence supporting linguistic advantages relative to early second language (L2) instruction, with the exception of a possible benefit in terms of enhanced auditory skills, particularly speech perception, pronunciation, and listening comprehension.

The fact that it is in the auditory sphere that younger learners sometimes outperform older learners brings us to the next point. Even though empirical advantages to the approach of starting foreign language instruction early are hard to find as far as overall language competence is concerned, there are some grounds for believing that there may be some benefit to an early start in terms of listening skills, even though findings on this issue remain contradictory (see Leśniewska & Singleton, forthcoming). Among studies which point to the auditory sphere as an area of a potential age-related advantage, one can cite the Barcelona Age

Factor Project (Muñoz, 2003a, 2003b), which looked at participants who began English instruction at different ages. The results of this study show that— for equal L2 exposure— older beginners outperformed younger ones on all aspects of L2 proficiency except listening comprehension, where the performance of the two groups was similar.

In parallel to the findings concerning naturalistic L2 acquisition, recent research on instructed L2 learning has also been highlighting the importance of input. A study that is worth mentioning in this context is Huang et al. (2020), which looks at the impact of input on the long-term second language outcomes of teenage learners of L2 English in Taiwan who had begun learning English between the ages of 2 and 11. The learners' proficiency was assessed on the basis of tests of speech production and listening comprehension. Past input in English (both in-class and out-of-class) was investigated by means of a questionnaire completed by the parents of the participant. The findings revealed that input played a significant role in long-term L2 listening comprehension outcomes, but not in speech production. Importantly, variables that had to do with early input (the number of hours of English instruction the participant had in preschool or kindergarten, the frequency of contact with English during the preschool / kindergarten years) were not significant predictors of long-term outcomes. The results also highlighted the importance of out-of-class input and demonstrated that environmental factors and also language learning aptitude had a notable influence on long-term outcomes both in L2 listening comprehension and in speech production.

Neurolinguistic Evidence

It is worth emphasizing that the original CPH (Lenneberg, 1967) concerns changes of a biological (neurological) nature. Interestingly, once it was put forward, countless studies sought to provide evidence for it by investigating human behaviour, particularly second language learning outcomes in individuals with different ages of acquisition. As has been mentioned earlier, such studies were unable to settle the matter. Even though there was some criticism of the CPH soon after it was proposed (notably, Krashen 1973: 65), decades had to pass before developments in science allowed researchers to address the CPH in strictly neurolinguistic terms. The last two decades have seen significant advancements in the understanding of how the human brain develops. The two developments in research techniques that have been crucial to the investigation of the CPH are electroencephalography/event-related potential (EEG/ERP) and (functional) magnetic resonance imaging ((f)MRI). EEG/ERP research involves recording small voltages resulting from the simultaneous firing of large groups of neurons in the brain. These voltages present various typical patterns in terms of amplitude, direction, and timing, and it has been established that different linguistic stimuli elicit distinctive patterns; for example, the N600 pattern occurs when native speakers process morphosyntactic information, while the N400 pattern is indicative of semantic processing. It is obviously extremely interesting to compare such patterns activated, for example, by a similar task in two different languages spoken by the same person: if the ERP patterns activated by the same stimulus differ between an individual's L1 and L2, this implies that the processing mechanisms are different for each language.

Despite some mixed results, with certain studies showing limited brain plasticity in adults (e.g., Bergmann et al., 2015), research findings overwhelmingly support the notion that the adult brain retains considerable plasticity (see DeLuca et al. 2019 for an extensive review).

Most importantly, the findings indicate that L2 learners at lower proficiency levels exhibit different ERP responses compared to L1 speakers for the same stimuli, while L2 learners at higher proficiency levels tend to exhibit ERP patterns similar to those of L1 speakers. DeLuca et al. (2019) assert that, in spite of small variations in findings of studies, the overall trend suggests a gradual shift in L2 learners towards qualitatively similar language processing to that of native speakers, which leads the authors to conclude that “there is no true fundamental difference in how language is acquired and processed, irrespective of age” (p. 188).

For example, studies on which compare monolinguals, bilinguals and L2 learners of Italian conducted by Kasparian and Steinhauer for lexis (2016) and morphosyntax (2017) provide proof for the ongoing plasticity of the adult brain by looking at language proficiency, the extent of language attrition, and the ERP patterns generated by responses to the same stimuli. In these studies, L2 learners (in this case, learners of Italian) with very high proficiency exhibited ERP patterns which were akin to those observed in speakers of L1 Italian who spoke no other language. At the same time, participants whose L1 was Italian, but who were forgetting the language owing to residence abroad, were in some cases (advanced attrition) associated with ERP patterns distinct from those of monolingual speakers. Likewise, comparable patterns of brain activity between late adult learners who displayed very high levels of proficiency in the second language, and those of native speakers, were noted by Bowden et al. (2013) and Rossi et al. (2017) for morphosyntax. According to Steinhauer and Kasparian (2020), the studies which used ERP and found patterns consistent with the CPH are usually early ones, which had inadvertently confounded AoA with proficiency, while, as time goes by and research methods are refined, research is providing increasingly robust evidence against the CPH.

The other technique important to this review is (functional) magnetic resonance imaging ((f)MRI), a non-invasive neuroimaging method that utilizes radio frequency pulses and magnetic fields to reveal the location of brain activity. MRI captures specific structures within the brain, while functional MRI provides insights into neural processes. Studies which utilize (f)MRI have yielded evidence regarding neuroplasticity in the adult brain with respect to language learning; “plasticity” refers here to changes in the volume and density of white and gray matter, as well as to changes in connectivity and activation patterns in the brain. The process of acquiring an L2 has been shown to induce discernible changes in the brain, leading to an expansion in both gray and white matter volume in regions associated with language processing. While there have been relatively fewer functional magnetic resonance imaging (fMRI) studies exploring the effects of more natural language acquisition, a study by Pliatsikas et al. (2015) identified patterns of white matter growth in individuals who acquired a second language later in life that closely resembled those observed in individuals who acquired two languages during childhood. De Luca et al. (2019) summarize their review of MRI research by stating that “MRI affords us the opportunity to literally see first-hand if the 1967 predictions hold. Evidence (...) clearly suggests they do not” (p. 185).

Conclusions

Although the age debate remains inconclusive despite decades of research, it holds significant real-world implications. The idea of maturational constraints limiting language learning beyond puberty has influenced the trend of lowering the starting age of institutional L2 learning. However, empirical research shows that the advantage of early L2 instruction

diminishes over time, and late starters may progress faster. Numerous studies have failed to show that early instruction leads to higher proficiency levels compared to instruction provided at a later stage.

In this article we have explored the idea of a “critical” period, showing that the detail of this notion is questionable and is the topic of lively debate, even among those who subscribe to it. We argue that the complexities of maturation and language are not resolvable by recourse to the simplistic solution of positing a physiologically determined phase which is crucially favourable to language acquisition. There are multiple factors playing a role in the relationship between age and language acquisition and these factors do not inevitably rule out the possibility of older language acquirers arriving at the same place as those who start their L2 exposure in childhood (cf. Singleton & Leśniewska, 2021).

Although some individuals attain notable success in learning a foreign language even when starting late, the majority do not.. Many factors, such as the amount and quality of input, as well as a host of environmental factors and individual differences, influence the language acquisition process.

An unfortunate side-effect of the focus on the search for the mythical maturational window has been that most of researchers’ efforts have gone into investigating early language acquisition, and on examining ultimate attainment (the final outcome of acquisition, if such a thing exists) in the light of the starting age of learning. Limited consideration has been given to the evolving character of L2 learning later in life, especially in the third age. In other words, the later parts of learners’ lives have mostly been ignored, as they were of no interest: from a CPH perspective, an older learner is doomed to fail (at least in some respects). This oversight is unfortunate because the acquisition of additional languages in late adulthood warrants research attention for various reasons. In our increasingly aging world, the global population aged 60 or over is projected to rise by 56% in less than a decade (United Nations, 2015). Moreover, global migration constitutes a highly conspicuous aspect of contemporary society, driven by diverse factors, and frequently resulting in scenarios where grandparents are unable to communicate in the language spoken by their grandchildren.

Despite the pertinence and significance of these concerns, the available body of research on the linguistic abilities and learning experiences of elderly individuals is relatively limited. This is, fortunately, beginning to change, with a handful of recent publications exploring L2 acquisition in adulthood, including senior adulthood (see Pfenninger & Singleton, 2019b; Singleton & Zaborska, 2021). Such research has revealed multiple benefits of language learning at an older age. While some studies on the cognitive benefits of learning a language in old age have yielded contradictory findings, there seem to be clear advantages of language learning for seniors in terms of their overall well-being, with the majority of studies indicating a beneficial effect on cognitive functioning, apart from gains in the socio-affective domain (see Klimova & Pikhart, 2020, for a review). At the same time, the gradual deterioration of sensory perception (especially hearing), memory and other faculties that accompanies aging needs to be duly acknowledged. An important point about L2 acquisition in older age is the heterogeneity of learners’ experiences and success rates.

Acknowledging the complex nature of the relationship between age and L2 learning brings us back to the topic that this article began with, namely Diane Larsen-Freeman’s contribution to the study of L2 acquisition. A theory which can be traced to her seminal paper (Larsen-

Freeman, 1997), best known as Complex Dynamic Systems Theory (see De Bot et al., 2007) makes it possible to reconceptualize the role of age in a way that recognizes that the connection between individual learners and their surroundings is in a constant state of flux and mutual influence, rather than being fixed and one-way (Larsen-Freeman, 2015; Verspoor et al., 2011). At the core of this conceptual shift is the importance of recognizing variation, context, and non-linearity in comprehending the system (Larsen-Freeman, 2015).

As Pfenninger, Festman and Singleton (2023) argue, the dynamic nature of interconnections between the factors shaping an individual's life may be the reason why age effects are poorly suited to generalization. A dynamic approach prompts different research inquiries about how the external and internal aspects of language learning interact over time, while acknowledging the uniqueness of any individual's specific situation. It also allows us to differentiate between biological age and the much less predictable "social" age. Methodologically speaking, such a change of focus requires a turn towards qualitative studies. Future research which adopts this direction will hopefully shed new light on the role of age in the perspective of lifelong learning, acknowledging the interconnectedness of the physiological, social and affective dimensions, recognizing the dynamic interplay of life-course factors, and identifying the contextual aspects which are salient to particular learners.

ORCID

 <https://orcid.org/0000-0003-2720-5965>

 <https://orcid.org/0000-0002-8121-2210>

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