

# Biological Age and Second Language Acquisition overtime: A Literature Review

Aitor Arenas Cendoya<sup>1</sup>

<sup>1</sup> University of Deusto, Bilbao, Spain; [aitor.a@opendeusto.es](mailto:aitor.a@opendeusto.es)

\* Correspondence: [aitor.a@opendeusto.es](mailto:aitor.a@opendeusto.es)

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**Abstract:** The issue of the influence of biological/chronological age on Second Language Acquisition (SLA) has been long studied in academia. This theoretical review paper addresses the evolution of this issue over the decades, specially addressing the reality of foreign language learning contexts and older adult learners, which have been studied to a lesser extent overtime. The early perspectives supported the existence of a special or critical period that would favor language learning before puberty. Since then, this theory has partially been supported in certain contexts in which learning a language at an earlier age has been found to be more advantageous. However, learning at later ages has not been found to be impossible. In general terms, the academic consensus seems to state that the Critical Period Hypothesis (CPH) would mainly be applicable to the phonological/phonetic domain. The consensus also tends to state that an adult can be a successful learner of a second language as long as certain aspects are present. For instance, by having good learning motivation/affectivity and an appropriate learning context. Moreover, adults would benefit from formal language learning classrooms because of their higher cognitive maturity and complexity. These findings suggest that older age does not seem to be an impediment for possible successful second language learning. At the same time, it is argued that learning a new language as an adult and senior can have positive effects for the learner in the cognitive and social domains, provided that the specificities of this age range are considered. Finally, new research regarding senior second language learning is deemed necessary.

**Keywords:** Second Language Acquisition (SLA), Critical Period Hypothesis (CPH), Age of Onset (AO), adult second language learning, social-psychological factors in language learning, older adults, lifelong learning

## 1. Introduction

In recent years, the number of older adults, understood as those who are over 60 or 65 years of age, is growing in all western societies. (Findsen & Formosa, 2011). Authors like Mühlig-Versen et al. (2012) have explained that it is important to provide resources, opportunities, and incentives so that adults and, especially, senior adults can still be active members of society. In this sense, Andrew (2012) explained that western societies are increasingly expecting older adults to be as independent, active and productive as possible. To continue learning during their whole lifespan is a way of contributing to active aging, by reducing cognitive obsolescence or decline, and contributing to the social, cultural, and economic development of a human being in the rapidly changing environment of contemporary societies (Martinez, 2006).

The European Council established in 2006 that being able to learn and use foreign languages is one of the key competences of lifelong learning and European institutions have since then reinforced the value of this idea (European Commission, 2019). It is a useful and even necessary tool to face a multilingual, multicultural, and globalized society (Basciera & Marcinkiewicz, 2016). Moreover, authors, such as Pawlak (2021), have recently mentioned that foreign language learning is becoming increasingly popular among seniors. However, there has been a long popularly accepted idea that learning a second or new language is notably easier in the early years of life. This idea or belief is still present among many learners (Horwitz, 1999) and could condition some adults and older adults who decide to learn a new language. This issue has been addressed by the academic community at least since the mid-20th century. The theories that favored learning a language before puberty dominated in the beginning (Lenneberg, 1967), but were later questioned and reformulated in numerous studies. For example, to cite several relatively recent articles, Marinova-Todd et al. (2000), Birdsong and Molis (2001), as well as Muñoz (2010, 2014).

The main purpose of this theoretical review article is addressing whether the age factor is or not a significant predictor of Language Achievement (LA) and whether age affects second language learning in any significant manner, particularly in foreign language learning contexts which have been less profoundly studied overtime than naturalistic settings and in the case of older adults learning a new language. This article will address the development of the issue overtime, trying to counteract the famous “earlier is better” motto in language learning. The review of the existing literature starts with the first academic studies regarding the issue which were published in the 1950s and ends with the perspectives of the last decades.

## **2. Materials and Methods**

An up-to-date theoretical review of the literature has been conducted in the processes of writing this paper. The principal authors of Second Language Acquisition (SLA) have been reviewed, particularly regarding their contributions to the issue of age and the learning of a second language. Both empirical as well as theoretical works have been considered in this paper. According to Snyder (2019), a theoretical review should include both recent and relevant information provided by the significant authors in each domain of expertise. It is a relevant way of summarizing and synthesizing different research findings, particularly when data comes from different knowledge areas. It can also point out the aspects in which there is a gap in the literature that may require new research (Snyder, 2019). At the same time, as Denney and Tewksbury (2013) pointed out, a literature review can include both classic and recent references to demonstrate a profound understanding of a particular topic. Moreover, literature reviews must make the topic clear and understandable for the reader. They are most based upon academic articles published in specialized journals and academic books. A good literature review should include the main themes and subthemes found within the topic. These themes are usually presented alongside the methodological issues and main findings of the studies that are reviewed.

## **3. Literature Review**

The issue of the relationship between biological/chronological age and SLA started to be addressed systematically in the 1950s. Authors such as Penfield and Roberts (1959) and Lenneberg (1967) stated that the human brain is very plastic during childhood, something that would favor language learning and acquisition during that period, being more sensitive to environmental stimuli. This theory, known as the Critical Period Hypothesis

(CPH), states that the human brain loses its plasticity and becomes lateralized and more rigid during adulthood, making learning a new language more complicated. In the 1970s, this issue was already addressed as an important one by authors such as Stern (1975). In 1977, Lamandella was one of the first authors to criticize the CPH theory, by considering childhood as a sensitive or more favorable time for language learning, but, at the same time, claiming that it is an achievable task during later ages and adulthood.

The CPH was initially related to the post-pubertal development of impaired native language skills. For instance, in the case of feral children and those deprived of normalized social contact as well as those recovering from aphasia in adulthood. However, there are important doubts regarding its appropriateness related to second language learning and it remains a discussed and controversial theory (Abelo-Contesse, 2009; Muñoz, 2012; Yi, 2021). For instance, Krashen et al. (1979) stated that adult learners of a second language tend to be faster learners regarding syntax and morphological aspects in the early stages of the process, as they are cognitively more developed, while children would develop a better ultimate attainment in the long-term, if they have frequent contacts with the target language during this period. In relatively recent times, Muñoz and Singleton (2011) explained that there is a consensus in the SLA academic area regarding this aspect, at least in the cases related to naturalistic settings, which are the ones in which the target language is the main means of communication in society. In this sense, Muñoz (2014) has argued that age may not be as important as a variable in the case of foreign language learning, as it is usually a formally instructed learning context with a usual limitation of target language input. Similarly, Pfenninger and Singleton (2019) explained that Age of Onset (AO) is not a strong predictor of Foreign Language achievement, as it is a learning context more prone to social, psychological, and teaching/learning methodological issues. This may mean that foreign language learning is an achievable task for adults. Moreover, Gómez (2016) pointed out that Foreign Language Learning can help to improve emotional, social, and cognitive aspects in adults and older adults, by creating a new cognitive challenge in a socially active learning environment that provides new opportunities for socialization.

Over the decades various studies have partially supported CPH. For instance, Johnson and Newport (1989) tested a series of Chinese and Korean immigrants who had arrived in the United States with different ages. In an English grammaticality test, the younger language starters performed better than the older ones, suggesting certain biological and maturational difficulties in second language learning. However, there were language aspects in which no major differences of performance were found (namely, plurals, word order, and progressive -ing). This suggested that adult language learning may be an achievable goal, although it may be more challenging. At the same time, the authors of the study also remarked that individual differences such as motivation and attitudes towards the target language and its culture could play an important part in second language learning, regardless of the age issue.

Several years later, Birdsong and Molis (2001) replicated the study by Johnson and Newport (1989). In this case, the study participants were natives of Spanish learning English in the United States. As in the previous study, the Age of Onset (AO) turned out to be negatively correlated to language achievement. However, the age effects were found to continue after the end of the Critical Period (usually situated around puberty), suggesting a possible decline in second language learning abilities with progressive aging. However, all participants did better in the overall scores in comparison to the previous study. Certain typological similarities between Spanish and English were described as well as the reasons for this. Moreover, apart from the influence of the native language, the amount of

use of the target language was a predictor of language proficiency in the case of this study. Finally, a few late learners were found to range in the near-native category.

In recent years, there seems to be a consensus in the literature regarding a possible Critical Period for phonetics and phonology, in contrast to other areas such as morphology, syntax, and vocabulary acquisition. This period would end around the early years of life (Saito, 2015; Dollman et al., 2020). In this sense, Odlin (2003) explained that phonetics can be more prone to cross-linguistic transfer than merely linguistic areas, explaining the usual presence of the native language accent while talking in a second language. Dollman et al. (2020) explained that having frequent contacts with native speakers of a target language could be a way of trying to overcome this difficulty. Moreover, Muñoz and Ca-dierno (2021) remarked on the importance of having target language exposure in the informal context set outside the instructed classroom. For instance, they valued alternating second language oral input with audiovisual materials or using subtitles simultaneously, as a way of associating images and target language words and expressions.

With the turn of the century, Marinova-Todd et al. (2000) argued that adult second language learning problems are mainly related to sociocultural, psychological, motivational, affective, educational context, and environmental factors. For instance, Ruiz Calatrava (2009) pointed out that fear of ridicule and frustration are important among some adults, especially among those who are older and have a lower educational level. These problems could determine the development of speaking language skills, by creating a hesitance for active language practice and classroom participation. Moreover, Ramírez Gómez (2016) explained that the negative stereotypes that surround learning in older adulthood create more negative attitudes and less ambitious learning goals among teachers and learners. Therefore, this author calls on both teachers and older learners to question ageist stereotypes and discrimination. The possible relevance of the psychological and social factors in second language learning would mark a sharp contrast with the theories arguing that adult second language learning problems are originated by age-specific biological decline and neurological change issues, such as CPH. Indeed, authors like Hinkel (2005) have explained that CPH is currently a disputed theory, except for the domain of phonetics, where there is more consensus regarding its applicability. In this sense, Muñoz and Singleton (2011) explained that there are frequent disagreements between different scholars regarding the onset and offset age periods for possible different critical periods in different second language learning areas such as phonetics, collocations, lexical aspects, morphosyntax, and so on. In this sense, Marinova-Todd et al. (2000) explained that age effects in second language learning tend to continue during one's whole lifespan and are not confined to a determined period or periods of time.

Supporting the idea of a successful adult second language learning, authors like Białystok (1994) have argued that adults can make a faster initial progress in the process of learning a new language than children can. According to this author, they could achieve a working ability to communicate in the target language earlier than children could do. In this sense, Robinson (2003) explained that adults tend to be more aware about the functions of a language system because of the higher cognitive development, having a higher possibility of self-regulating a language learning process, and usually benefiting from formal as well as explicit learning contexts. Indeed, Muñoz (2010) argued that adults are cognitively mature individuals who can reflect on and self-regulate a second language learning process to a certain measure. Regarding the use of implicit knowledge, Doughty (2003) explained that comprehensible input can be useful for adult second language learners, but to a lesser extent in comparison to formal learning. Certain adults are highly proficient in a L2. For instance, Birdsong and Molis (2001) remarked that approximately 5% of adult

second language starters achieve a native or near native level, suggesting that native likeness is not especially rare or impossible for adults. At the same time, Muñoz and Singleton (2011) explained that trying to sound very similar to a native speaker may not be a realistic objective for a second language learner, irrespective of age, particularly, in a foreign language learning context with usually limited access to native speakers. Having a reasonable ability to communicate would be a more desirable objective. Moreover, according to Piccinin and Dal Maso (2021), in the case of adult learners, L1 literacy skills (reading and writing abilities) which have been developed overtime are partially transferable to second language reading and writing skills, if there are at least certain typological similarities between both languages. This is explained by the fact that adults are cognitively developed individuals, with usually higher experience with formal learning and higher development of native language skills. The possible advantage of adults for L2 reading and writing skills as well as for the development of morphosyntax was already noted by authors such as Cummings (1981). Regarding reading skills, Patria (2023) remarked on their importance to sustain literacy and educational development.

Adults and older adults (in particular) could face certain cognitive challenges when learning a new language. For instance, Kemper (2006) stated that older adults tend to have a cognitive deceleration and some problems with their working memories. This could slow down language comprehension and production as well as create certain difficulties with new vocabulary retrieval. However, as Martínez (2006) noted, adults can benefit from learning methods in which they can decide by themselves the speed of learning and response to stimuli. Allowing the adult learners for more time and practice could be a way of ensuring that adequate and competent learning takes place. In this sense, authors such as Osle (2020) found out that older adults learning a foreign language tend to have difficulties with listening and speaking abilities because of a deceleration of the processing speed as well as with phonetic coding, timed exercises and new vocabulary retrieval. Kuklewicz and King (2018) explained that older adults tend to demand a slower pacing in the lessons as well as a frequent repetition and revision of previous concepts. Moreover, it is also important to bear in mind, as Birdsong and Molis (2001) pointed out, that individual differences between learners tend to be more remarkable during adulthood in the case of Second Language Acquisition (SLA). This circumstance means that there may be important variations between individuals regarding proficiency level, use of various Language Learning Strategies, learning motivation, and so on. Finally, authors such as Eguz (2019) have explained that older adults could have certain hearing and sight problems, making it necessary to adapt the facilities of the classroom to their needs by making the audios louder, using bigger texts fonts, slowing down the pace of the information presented, eliminating external noise and so on. At the same time, this author remarked on the importance of textbooks and learning materials reflecting the reality and needs of older adult learners of foreign languages, being adequate to their needs and avoiding ageism.

#### 4. Discussion

After some of the main findings of this knowledge area have been reviewed, it could be argued that there is not an ideal age to learn a new language. As Abrahamsson and Hyltenstam (2003) explained, learners of any age-range are usually able to acquire considerable amounts of a second language, if the right conditions and circumstances are met. According to Abello-Contesse (2009), among other aspects, the cognitive abilities of a learner, motivational orientation and intensity, language aptitude, memory-related abilities, affective state, learning styles and strategies used, quantity and quality of target language input, amount of language use and the time or resources devoted to the learning

process are of particular importance. At the same time, the relevance of teaching methodologies and educational contexts cannot be understated. All these aspects may have a more profound effect in the process of learning a new language than the age of starting it, especially in foreign language learning contexts, suggesting that learning another language as an adult and older adult is a realistic and achievable objective. At the same time, it is important to bear in mind, as Lightbown (2000) remarked, that both substantial and sustained second language exposure is necessary to achieve success in a target language, regardless of age. In this sense, Tukiainen (2003) explained that the process of mastering a second language is relatively long, requiring considerable amounts of both time and effort. Although the interlanguage grammars of both child and adult second language learners tend to be incomplete compared to native speakers and fossilize at a particular point in time (Montrul et al., 2008), this circumstance is not seen as problematic as long as the learner has a reasonably proficient mastery of the second language and is able to communicate successfully (Baildon, 2018). Moreover, as Muñoz and Singleton (2011) pointed out, the field of neuroscience has started to yield some interesting data regarding how language is processed in the brain by means of neuroimaging-based studies, although it is still a relatively recent area of knowledge that is still developing. It could be a way of clarifying the debate regarding the age issue in language learning in the future.

Different authors remark the value of learning another language during adulthood and older adulthood, both as cognitive stimulation (Antoniou et al., 2013) and a space for new socialization (Narushima et al., 2018) in the case of lifelong learning courses. In this sense, Antoniou et. al. (2013) suggested that foreign language learning can be positive for a general cognitive improvement, as it engages a large brain network consisting of both memory abilities and executive functions. Moreover, avoiding isolation by means of having a rich and varied social environment (a socially active lifestyle with an important number of social networks) can improve both cognitive abilities and overall health well-being in the adult person. In fact, high quality and quantity social relationships are generally associated with lower levels of stress and anxiety which are necessary to internalize learning processes better (Fratiglioni et al., 2004). Furthermore, Klimova and Pikhart (2020) found in a systematic review of articles regarding this issue that second language learning tends to help in either maintaining or even increasing cognitive functions during any life period. Finally, as Eguz (2019) explained, older adults are usually learning a second language voluntarily, without the need of having official certificates of achievement, and tend to be intrinsically motivated. Mora and Abad (2016) pointed out that older adult foreign language learners tend to approach language learning activities to augment their self-esteem and self-satisfaction levels. In this sense, Teimouri and Plonsky (2022) noted that, as human beings age, they tend to show more grit. That is, they tend to become more focused on achieving long-term goals and perseverating to achieve those goals. Therefore, the older adult second language learner needs tend to be specific. For instance, communicating as much as possible in the relevant contexts as well as having access to more information, entertainment and services (Eguz, 2019). In this sense, Słowik-Krogulec (2019) noted that their learning motivations usually include communicating with foreign friends or relatives, understanding the presence of the foreign language in their daily lives, understanding songs or movies in their original versions as well as browsing the internet. Moreover, authors such as Pikhart et al. (2021) point out that being able to communicate adequately while traveling to a foreign country is also a usual source of motivation for senior learners of a new language. Authors such as Kuklewicz and King (2018) and Osle (2020) have recently remarked on the need to address the needs of older adults in language teaching as well as the necessity to conduct more studies reflecting the realities of older language learners, as this activity is becoming more common among them.

## 5. Conclusions

The issue of the influence of biological/chronological age on Second Language Acquisition (SLA) has long been addressed in the academic studies that have spoken about this issue over the years. It has been a topic for intense debates, with different and even conflicting views appearing in the literature. According to most of the latest perspectives, the variable of age may not be as important or crucial as it was thought to be several decades ago, particularly in a foreign language learning context. In this sense, age effects seem to be intertwined with numerous cognitive and contextual factors. However, the discussion remains open in the scientific world and may yield new debates and conclusions soon. The current perspective supports the plausibility of learning another language for older learners, both in terms of possible successful learning and the benefits directly derived from it. It is a task that could be more challenging in the case of older adults, but it may be achievable if their needs and expectations are given consideration.

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