

Optimal Age for Second Language Acquisition

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Abstract: Few second language researchers now question the suggestion that learners whose exposure to the second language starts early in life, as long as such exposure is sufficient, for the most part attain an eventual higher degree of proficiency compared to those whose exposure starts during or after adolescence. However, the question, that continues to be the point of departure for scholars in this field, and which is the focus of the current review, is whether the effects of age in second language acquisition comprise a manifestation of a preprogrammed critical period explicitly related to language or whether they are indicative of other, more general, factors that influence second language learning. Anchored on a critical review of authoritative and relevant literature, the present study addresses the question of the possibility of an optimal period for language acquisition by, first, exploring the theory of a critical period and some significant evidence in relation to age differentials in second language acquisition. Finally the researcher explores some possible explanations for the age effects, which do not necessarily rely on the notion of a critical period for second language development. Following an examination of the evidence, the researcher concludes that age must be viewed as involving various issues, among them length of exposure, as well as motivational and cognitive factors.

Keywords: Second language acquisition, Age of acquisition, Critical period hypothesis, Ultimate native-like attainment.

1. INTRODUCTION

The relationship between age and second language acquisition comprises one of the most frequently debated and investigated issues in the area of second language acquisition (SLA). A preliminary review of literature reveals two different orientations in research related to age in second language acquisition. One of the orientations is highlighted by DeKeyser (2013), and comprises research seeking to explain the existence and the characteristics of maturational impediments on the human capability for learning second and subsequent languages. The second orientation intends to identify age-related variations in second language acquisition with the intention of informing educational policy and practice. Regardless of the orientation, learners' age is gaining immense scholarly interest in terms of its relationship with second language acquisition. Much of the previous research comparing younger and older learners have constantly shown an advantage for younger learners compared to their older counterparts (DeKeyser, 2013; Nikolov & Djigunovic, 2006). These findings have been used to give credence to the critical period hypothesis, which posits that there exists a crucial period during an individual's life, after which the acquisition of language is either incomplete or imperfect. Lenneberg, as cited by Larson-Hall (2008), places this period at about age two and ending around puberty.

However, while the postulations of the critical period hypothesis and the possibility of a relationship between age and language acquisition has been the focus of considerable scholarly attention, there has been very little scholarly attention given to synthesizing the available evidence, with the aim of determining whether there are other factors that influence this relationship. As such, based on a critical review of relevant and peer-reviewed literature, the present research explores the general opinion relating to the age at which the learning of a second language is ideal. The undertaking is informed by the idea that, if it can be demonstrated that younger learners perform better in second language acquisition compared to older learners, then the case for an early beginning for second language acquisition is reinforced. Furthermore, if it can be demonstrated that children learn languages in different ways from their adult counterparts, teachers and policy makers would need to establish different techniques and approaches that suit language acquisition in the different categories of learners. The report begins by offering a critical summation of what the literature says about the critical hypothesis and the role of neurobiology and cognitive science explanations, followed by a review of pertinent themes and findings in age-related research.

2. LITERATURE SEARCH

To enable the analysis of the relationship between age and second language acquisition, the present study employed a critical review of secondary data and literature. The critical review approach was chosen for the present review based on a preliminary review of literature, which noted a shortage of studies synthesizing and analyzing available theoretical and empirical information on the critical hypothesis, and potential role of age in language learning. In addition, as indicated by Windle (2010), secondary data and literature analysis offers a time-effective and cost-effective way of integrating information in an area, with the view of informing practice and future research. The articles and studies used for the current review were identified through an electronic search of reputable websites and databases like Wiley, SagePub, Researchgate, Elsevier Palgrave, and Emerald Library. The researcher also conducted additional searches on general search engines like Google Scholar to identify 'grey' material. To enhance relevance, the inclusion was limited to full articles published in the English language after 2008. The search terms used in the identification of relevant literature included second language acquisition, age, and affective factors.

The Critical Period Hypothesis and Neurological Explanations for Differences in Second Language Acquisition

One issue that has captured the interest of scholars and practitioners in the field of linguistics for several decades is the question of whether there is an age factor in second language acquisition. The reasons for the continued interest in the debate are both theoretical and practical. On the theoretical perspective, previous scholars have argued for an interaction between the idea of maturational constraints to the acquisition of language and the idea that language learning is shaped by bio-programming.

One of the main theories regarding the possible relationship between age and second language acquisition is the critical period hypothesis. Formulated by Roberts and Penfield in 1959, and popularized by Lenneberg in 1967, the critical period hypothesis can be summed as the concept of a biologically determined period in the individual's life, during which language can be learnt more easily, and after which language acquisition becomes increasingly difficult (Kaiser et al., 2015). The theory posits that the crucial point in second language acquisition happens between the age of two and puberty, beyond which individuals seem comparatively unable to acquire second language. If this were the case, then this period would be ideal for learning second and subsequent languages.

Support for the critical period hypothesis has been sought from neuropsychology. According to DeKeyser (2013), the period of optimal language acquisition coincides with a crucial period in neurological development, during which the individual's brain exhibits maximal plasticity, and thus, a maximal potential for development. There is also significant neurological research evidence indicating that before the beginning of puberty, damage to the human brain may not necessarily result in permanent impairment of function (Archila-Suerte, Zevin & Hernandez, 2015). The assumption here is that other regions of the brain close to the area of injury take over the functions of the damaged tissue. However, damage to the brain following this critical period often leads to irreversible and permanent impairment. It is, therefore, recommended that programs take advantage of the child's growth potential and neural plasticity by introducing second language instruction in the early period of development.

In addition, and more particularly, the ideal period for second language learning is assumed to coincide with the development of varying hemispheric specialization, especially in terms of its relation to language functions. For instance, as noted by Kaiser et al. (2015), in many right handed individuals, the left brain hemisphere often develops a specialized capacity for various language functions, including speech production, speech comprehension, and verbal memory, while the right hemisphere is postulated to specialize in the processing of non-verbal information, such as spatial, musical and visual material. Information from neuroscience suggests that complete hemispheric lateralization of the two brain functions are achieved at around the age of 13. In the same respect, some scholars posit that the completion of the process of cerebral lateralization signifies the beginning of the end of language learning optimal period (Larsen-Freeman & Long, 2014). The implication, therefore, is that it becomes much more difficult to learn a second language during and after adolescence since the areas of the brain responsible for learning languages become more fixed at puberty, limiting the ability to acquire new language skills.

Recent neurobiological explanations and cognitive approaches to understanding second language acquisition have also demonstrated a distinction between the processes implicated in the development of language proficiency. Kaiser et al. (2015), for instance, indicate that, unlike adults, who are typified by rule-based learning, young children depend more on

memory-based processes. This assertion is supported by evidence showing that the particular areas of the brain that are critical in particular domains of learning can shift over one's life span (DeKeyser, 2013; Kaiser et al., 2015; Larson-Hall, 2008). Larson-Hall (2008), for instance, demonstrate evidence that the right hemisphere of the brain is involved in much of learning during early years, but not so much in later learning. A different study conducted Bates and Dick (2002) also demonstrated that young children with lesions on the right hemisphere of their brains showed delayed word comprehension as well as the delayed use of communicative and comprehensive gestures. According to the researchers, these problems were not exhibited by adults with right hemisphere lesions. The implication here is that there may be a connection between the word comprehension problems exhibited by children and the right hemisphere. This connection can be attributed to the fact that, to comprehend the meaning of new words, children need to integrate information from various sources, including visual information, acoustic input, tactile information, emotions, and memories from the previous context.

The critical period hypothesis implies implicit linguistic competence. In other words, the decline in procedural memory for language compels late learners of second languages to depend on explicit learning, which leads to the application of a cognitive system that differs from the one that supports the native language. Acquiring implicit language competence is underpinned by the learner's age either biologically or cognitively. In terms of biology, the plasticity of the procedural memory for language during the early years of development gradually reduces after an individual reaches age five (Munoz, 2006). Cognitively, the individual's dependence on conscious declarative memory gradually increases from around age seven both for learning a language and learning in general (Pfenninger & Singleton, 2016). However, it is important to note that the critical period can be masked to some level by compensatory mechanisms. For instance, learners with exceptional metalinguistic memory, the critical period hypothesis may not apply.

Various Research Themes in Age-Related differences

On the practical front, scholars have claimed that younger second language starters have a significant advantage over older beginners, an assertion that has been disputed and invoked in decision-making in the ideal starting point for second language instruction. Our understanding of the possibility of a critical period during which second language learning is ideal must be informed by various research findings on the role of age in language acquisition. While the areas of research on age-related language acquisition vary widely, some of the common themes include age-related advantages, the age at language acquisition, duration of exposure, and learning mechanisms. This section integrates findings from recent research on age-related factors in language acquisition, and groups the analysis according to the common themes.

Age-related Advantages

One of the core premises of the critical period hypothesis is that early beginners in second language learning are often better placed compared to their older counterparts. However, as noted by Pfenninger and Singleton (2016), much of the research in this area has been carried out in natural learning settings, with the studies typically grouping large categories of second language learners and comparing such large groups in terms of their age of learning onset. The findings of many of these studies have consistently shown that younger beginners generally outperform older beginners in various skills, mainly in pronunciation (Munoz, 2006) and in morphosyntax (Hopp & Schmid, 2013). The superiority of younger beginners refers to the learners' ultimate attainment in language acquisition following a prolonged period of exposure to the second language.

In contrast, studies that have compared older and younger learners in their natural settings following relatively short periods have established that older starters often outperform younger beginners in the short periods of learning (Munoz, 2006). Based on this variance, a distinction can be drawn between language learning rate and ultimate language acquisition. Hopp and Schmid (2013) show that, in terms of rate of language acquisition, older beginners tend to outperform their younger counterparts in the short term. The ability of older starters to advance faster in the initial stages of second language learning makes them more efficient learners in the short-term. In other words, adolescent and adult learners have an advantage in second language learning in the short-term. However, in contrast, the younger beginners, despite their relatively slow start, have a superior proficiency level attainment in the long term. In fact, as demonstrated by Munoz (2006), the proficiency level of younger starters in terms of second language acquisition in the long term can be native-like. In other words, younger starters have an ultimate second language attainment advantage.

The ultimate language acquisition advantage of early starters in natural second language learning settings can also be generalized to younger learners in settings of instructed language learning. However, as noted by Hopp and Schmid (2013), it is important to reiterate that there is a dearth of consistent empirical research supporting such generalization. In regards to instructed learning settings Hopp and Schmid (2013) suggests that the superior ultimate achievement of younger learners in instructional settings may take longer periods to emerge due to the scarcity of input to which such learners are exposed. Nevertheless, starting instruction in the early years of development appears critical for native-like second language acquisition. It is, however, important to note that, in general terms research findings do not support the concept that children are 'sponges' in the acquisition of a second language, at least, as far as rate of achievement is concerned.

Age of Second Language Acquisition

The age of second language acquisition is another important factor in the debate of the possible existence of an ideal period for language learning. As indicated by Archila-Suerte, Zevin and Hernandez (2015), the age of language acquisition in the natural setting is a very important predictor in age-related research. Here, the age of onset or age of acquisition is taken to imply the start of significant exposure, or the commencement of immersion into the second language context. This milestone is differentiated from the age of first exposure in such studies in which learners have had some instruction in the target language in their home country prior to immersion or immigration (Saito, 2015). Unlike the age of acquisition, the age of first exposure has not been shown to be an important predictor of ultimate second language acquisition (Archila-Suerte, Zevin & Hernandez, 2015). The explanation for this could possibly be that it only offers insignificant exposure. The situation is different for language learning in instructional settings, where the initial age of learning at schools is considered to be an important variable (Saito, 2015). In the setting of second language learning, the entire age span during which learning occurs ought to be taken into consideration since it may have more impact on the language learning process as well as the final learning outcomes compared to the age at learning onset, at which the amount of learning and exposure is minimal.

Length of Exposure

Another recurring theme in age-related literature is the role of the duration of exposure in second language acquisition. In natural second language learning settings, the length of exposure is likened to the duration of residence in the target language community, starting from the age of acquisition or onset to the age of testing (Munoz, 2010). Due to the advantage held by older beginners in relation to rate of language learning, it may be argued that comparisons ought to be carried out after periods that are long enough to determine that it is ultimate acquisition achieved, instead of just rate effects.

In terms of the ideal length of exposure for ultimate attainment, there is no consensus among the scholars with different suggestions being fronted. However, the most common recommendation suggests a minimum of 10 years for ensuring ultimate attainment (Pfenninger & Singleton, 2016). It is, however, important to note that this duration for ultimate attainment may not be realizable for instructional classroom learning, meaning that many of the second language learning in classrooms are likely to result in the effects of language learning rates. In natural learning settings, the length of residence has also been found to impact the accent of the individuals who stay in the host country (Hopp & Schmid, 2013). Given the prolonged time required for ultimate attainment as well as the advantage held by early beginners in ultimate native-like second language acquisition, it may be inferred that younger starting age is good for better second language acquisition outcomes.

It is, however, important to note that equating the time of immersion in the target language with the time of instruction in classroom settings is a gross generalization. In fact, an approximation of the number of hours in which the language learner in the natural setting has access to the second language input after a ten-year period of residence is more than 50,000 hours. When these hours are distributed to weeks with four one-hour instruction periods results in more than 200 years of instruction. While this comparison may appear absurd, it highlights the compelling notion the magnitude of the disparities in the input quantity received by instructed and naturalistic learners is immense. The differences also exist in terms of input quality, including such considerations as linguistic characteristics, speech topics, speech acts, and speech situations (Saito, 2015). In essence, therefore, the differences in quality and quantity of the input to which second language learners are exposed in a natural setting and in a typical instructional setting are too significant to be ignored.

In relation to the differences between the age impacts in instructional language learning contexts and naturalistic language learning contexts, the role of the length of residence appears to change. In fact, according to Pfenninger and Singleton (2016), the length of residence loses its importance as a predictor of second language proficiency after the initial period in natural learning contexts. However, this cannot be the case for instructional settings in which the amount of input that would be comparable to the 'initial period' in a naturalistic learning context may never be offered. In such classroom contexts, the learners' amount of instruction can be anticipated to correlate with proficiency scores, though recent research has demonstrated that the connection between the time spent learning a language and the degree of proficiency in that language is not always linear (Muñoz & Singleton, 2011). However, with greater amounts of exposure learners with an earlier age of onset appear to have better outcomes in communicative skills, such as oral production, pronunciation, and listening comprehension compared to older learners (Pfenninger & Singleton, 2016). In sum, it has to be taken into account that for sufficient exposure to the language is critical for second language acquisition, irrespective of the age at onset of language learning.

Learning Mechanisms

Another factor in understanding the relationship between age and language learning is the possibility of different learning mechanisms between older and younger learners. According to Munoz (2010), there is a possibility that the automatic language acquisition from mere exposure to a language may diminish after puberty. This assertion agrees with the strict formulation of the critical period hypothesis that an early exposure to a second language is beneficial as it capitalizes on the individual's innate language learning capacity. The understanding here is that after puberty, the individual loses the mental equipment necessary for the implicit induction of the abstract patterns fundamental for human language.

From such assertions on the diminished capacity for automatic language acquisition, it is apparent that maturational constraints apply to implicit language learning mechanisms, at which younger learners are postulated to be superior to older learners (Abrahamsson, 2012). It is, however, important to reiterate that implicit learning works slowly, and may necessitate several years of interaction and massive input, which can only be achieved through total immersion programs (Munoz, 2010), rather than instructional programs that offer only few hours of foreign language learning every week. The understanding here is that in traditional instructional second language learning settings, children are not given the massive amounts of input demanded by their implicit learning mechanisms. This point can be better illustrated using the sponge metaphor, which compares children's superior capacity for absorbing new language to the capacity of a sponge to absorb water. Using this analogy the situation in which children lack sufficient input can be compared to when sponges lack enough water, limiting its ability to demonstrate its absorption capacity.

Unlike for children, instructional setting offer explicit instruction suited for adults and adolescents, especially given their higher degree of general cognitive maturity. This explicit-implicit approach to learning mechanisms could partly explain the advantage of older learners over younger learners in instructional settings. Such an advantage is reported by Nikolov and Djigunovic (2006), who indicates that, in addition to the initial faster rate of learning exhibited by older learners, older learners also benefit from the fact that school instruction is better suited for their cognitive capabilities.

Can Adults Attain Native-Like Proficiency?

One area of significant scholarly interest in the age-related debate in second language acquisition relates to the ultimate language attainment of late beginners. In this respect, differences between late beginners and early beginner programs in foreign language and immersion settings have been explored, with varying findings. Abrahamsson and Hyltenstam (2009), for instance, explored whether native proficiency can be achieved by learners beginning second language learning after the critical period. The researchers found that the length of exposure in years did not predict the learners' ultimate attainment. Rather the main factor, according to the research was the age of beginning language acquisition. The findings are similar to those by Muñoz and Singleton (2011), who found that the best significant predictors of native proficiency included the age at the onset of language learning, length of exposure, and education in the host environment. The findings of these studies pose a significant challenge to the strong version of the crucial period hypothesis by identifying learners of a second language who acquired native-like proficiency despite starting second language learning after the critical period. Studies of this nature go beyond the traditional research into the age factor to explore factors that make adult learners different from younger beginners.

An important factor in the ability of adult learners to realize native-like proficiency is motivation. Hopp and Schmid (2013) found that all post-puberty learners who had been frequently mistaken for native speakers strived towards unaccented proficiency in the second language. In this respect, the success in language learning is underpinned by intrinsic motivation in the target language. For many of the successful language learners, the target language is viewed as either part of the individual's profession or they have had a strong integrative drive to become bona fide members of the second language society. Intrinsic motivation is thus, a major driver for second language acquisition, especially for adolescent and adult learners.

Another factor underpinning the ability of adult learners to attain native-like proficiency is the intensity of language use. Research on successful language acquisition of adult learners has found complete immersion of in the host environment, often through marriage to a native speaker, for a prolonged period of time is supportive of native proficiency (Muñoz & Singleton, 2011). The understanding here is that with more intense prolonged language use, adult learners can attain a level of proficiency that is native-like. In sum, native-like ultimate language attainment is possible for adults who commenced second language learning after puberty, a fact that pokes holes in the strict version of the critical period hypothesis. If indeed, adults can attain native-like language proficiency, does age really matter for second language acquisition.

Does Age Really Matter in Second Language Acquisition?

Given the discussions in the previous sections, the main question that remains to be answered is whether age of a driving factors in second language learning. Here, the question of when it is the ideal age for second language learning appears to be linked to the amount of exposure or input to the target language. Scholars in the fields of linguistics and cognitive sciences are still struggling to explain sufficiently the precise effect of age on the language learner, especially when the exposure to language is insufficient (Munoz, 2010; DeKeyser, 2013; Abrahamsson & Hyltenstam, 2009). According to Abrahamsson and Hyltenstam (2009), the quality and amount of language input is critical for young learners at early stages of second language acquisition. While there is immense evidence offering positive support for the critical period hypothesis, there are other factors in second language acquisition that are equally as important as age. The previous sections show that, while age can play an important role in improving second language acquisition, there are other factors involved that must be considered for optimal language learning. However, if the age effects are not to be explained in terms of a critical period for language acquisition, especially in the face of evidence that even adults can acquire ultimate attainment, then there must be other ways of explaining such variances.

The Role of Socio-Motivational Factors

One possible explanation for the differences in second language learning between early and late starters is social or motivational factors. Apparently, adults require particular or greater motivation for learning a second language compared to younger learners (Archila-Suerte, Zevin & Hernandez, 2015). The motivational or social factors, while existent in childhood second language acquisition, have little or no effect on the learning of the second language (Muñoz & Singleton, 2011). However, while the motivational and social factors may explain second language acquisition disparities among older beginners, they fail to explain the higher language learning rates of younger individuals.

Nevertheless, a distinguishing characteristic between older and younger language learners is the probability that the older beginner will fossilize the various elements of his language acquisition, one of which is pronunciation (Muñoz & Singleton, 2011). One possible reason for this fossilization could be that the older learner simply fails to notice the variances between his own pronunciation and how the host community produces the sounds. Another possible reason for pronunciation fossilization is that the learner may want to maintain their social identity with the first language community, thereby using the non-conformity as a way of maintaining the social identity. While motivation may not necessarily guarantee success in language learning it is apparent that learners who are more highly motivated register higher degrees of success compared to those who are less motivated (Khodadady & Khajavy, 2013). It can be inferred, therefore, that motivation, along with specific phonetic training, access to second language input, and language learning aptitude, are necessary, though not sufficient requirements for the attainment of native-like second language proficiency. A combination of these factors can help older beginners overcome the limitations of the critical period.

Cross-Linguistic Factors

Another possible way of explaining the age differences in second language acquisition is through cross-linguistic factors. An important cross-linguistic factor is a possible tradeoff between second and first language proficiency. According to Larsen-Freeman and Long (2014), most bilinguals are incapable of fully separating the phonetic systems of the first and second languages. In other words, the phonic aspects of first language subsystem necessarily impact the phonic aspects of the second language system. The phonic aspects of the second language can also affect the phonic aspects of the first language, in the sense that young children may acquire a good second language accent at the expense of their first language accent (Munoz, 2010). In sum, first language phonology continues to be refined during the early years of development, and its impact on the phonology acquisition of the second language phonology continuously increases accordingly.

Cognitive Factors

In much the literature on the relationship between age and second language acquisition, cognitive factors are also referred to as language learning aptitude. As indicated by Abrahamsson and Hyltenstam (2008), aptitude implies a learner's readiness for language learning or cognitive disposition. As previously mentioned, various elements must be present in the second language learning by late beginners for a measure of success to be realized, while such elements may not be a requirement for second language acquisition for children. One of such factor is language aptitude, which does not factor into childhood language acquisition since children have no need for access their problem solving skills, and can learn a second language based solely on implicit learning (Abrahamsson, 2012). The assumption here is that, while a relationship between language aptitude and ultimate language attainment exists during childhood and adulthood learning, it is only necessary for older learners. In addition, while adults may have a higher degree of cognitive development and a better mastery of the first language compared to younger learners, evidence still shows that they often fail to attain native-like proficiency. The isolated cases of older learners who attain native-like proficiency can, therefore, be partly explained by their language learning attitude as well as conscious attention to grammatical form.

An important element in the role of cognitive function in second language acquisition is working memory. As noted by Gass (2013), working memory is a cognitive function that has been demonstrated to have significant impact on second language acquisition. Younger beginners in second language acquisition are able to use procedural memory in learning, which, according to Ullman (2015), is available until the child reaches five years of age. Older learners on the other hand rely on declarative memory for learning. These differences in the type of memory used are reflected in the processes of language learning as the use of procedural memory often results in incidental language acquisition and implicit language competence (Abrahamsson, 2012). Declarative memory, on the other hand, allows the older learners to intentionally learn the second language, resulting in explicit competence. The differences in cognitive functioning, together with other elements in the language environment and socio-motivational predisposition of the learner are as important as age in explaining the individual differences in second language acquisition.

In summary, there appears to be advantages related to early beginning of second language learning, which have been the thrust of the debate on the critical period hypothesis. However, the present review demonstrates that age, while definitely an important factor, is not the sole consideration in effective second language acquisition. In fact, late instruction offers learners an advantage by the virtue of improved learning efficiency, while early instruction offers the benefit of malleable cognitive and neural potential and extended learning opportunities within and outside the classroom. Learners who begin early can also benefit from the advantages enjoyed by older learners as long as they continue second language learning through higher grades. The combined advantages of both stages of language learning facilitate the possibility of native-like proficiency in the second language. Nevertheless, the present discussion shows that focus should not be solely on age as a factor in second language acquisition at the expense of other factors such as motivation, language input, length of exposure, and the language learning environment (naturalistic or instructed).

3. CONCLUSIONS

While the critical period hypothesis has been the subject of much scholarly attention, there is a shortage of studies that synthesize literature and information on the theory with the view of determining whether there are factors other than age that influence second language acquisition. Based on a review of relevant and authoritative literature, the present paper seeks to narrow this information gap by analyzing theoretical and empirical studies on the relationship between age and

language acquisition. The arguments presented in this paper in support of early beginning of second language instruction can be summarized into various points. First, studies in adult and child second language acquisition research show that the length of exposure can influence second language acquisition in a favorable way, although longer exposure to the second language may not guarantee immediately superior outcomes. Secondly, the bilingual ability due to second language acquisition can improve metalinguistic awareness and cognitive development, and may encourage further learning. However, other than an early start, there are other factors that must be considered in language acquisition, including positive attitudes and motivation, the methodology, frequency, and content of the second language programs, and instructor proficiency. In sum, there are studies that support the 'younger equals better' postulation, while other studies show that even older beginners can overtake younger starters in terms of ultimate proficiency. Despite the significant differences, consensus appears to be emerging, in the sense that while older learners have an initial advantage in terms of the rate of learning, especially in grammar, they are later overtaken by younger learners who obtain sufficient exposure to the second language. The review has also shown that, while the process of second language acquisition may not be underpinned by age, the acquisition of pronunciation may be. In conclusion, age is definitely an important positive factor, but there are other factors besides age that must be considered for successful second language acquisition.

4. RECOMMENDATIONS FOR FURTHER RESEARCH

Based on the discussion in this paper, various recommendations can be made for future research undertakings aimed at improving second language instruction. First, the review notes that while many studies suggest a superior second language proficiency of early beginners compared to late starters, much of the available information does not determine whether these learners obtain ultimate native-like attainment. As such, it is recommended that future research tries to identify and compare the ultimate attainment of early and late beginners. In addition, there is a need for further research on organizational factors, including age of onset, quantity of exposure (compared to length of exposure), transfer, and content teaching. Such studies should also integrate the amount and role of extracurricular language input outside the classroom environment, to determine how such input mediates the age-differences in language acquisition.

The current review has also noted a shortage of longitudinal studies examining the impact of age on second language acquisition. The researcher notes that such studies are important as they give a long-term understanding of the learning experience of learners over time, integrating cognitive, linguistic and affective factors contributing to early beginners' second language development in various contexts. It would also be appropriate for future research to explore how the factors identified in this paper, including attitudes, aptitude, motivation, and duration of exposure contribute to second language acquisition over time, and how they affect older and younger learners differently.

REFERENCES

- [1] Abrahamsson, N. (2012). Age of onset and nativelike L2 ultimate attainment of morphosyntactic and phonetic intuition. *Studies in Second Language Acquisition*, 34(02), 187-214.
- [2] Abrahamsson, N., & Hyltenstam, K. (2008). The robustness of aptitude effects in near-native second language acquisition. *Studies in second language acquisition*, 30(04), 481-509.
- [3] Abrahamsson, N., & Hyltenstam, K. (2009). Age of onset and nativelikeness in a second language: Listener perception versus linguistic scrutiny. *Language learning*, 59(2), 249-306
- [4] Archila-Suerte, P., Zevin, J., & Hernandez, A. E. (2015). The effect of age of acquisition, socioeducational status, and proficiency on the neural processing of second language speech sounds. *Brain and language*, 141, 35-49.
- [5] Bates, E., & Dick, F. (2002). Language, gesture, and the developing brain. *Developmental psychobiology*, 40(3), 293-310.
- [6] DeKeyser, R. M. (2013). Age effects in second language learning: Stepping stones toward better understanding. *Language Learning*, 63(s1), 52-67.
- [7] Gass, S. M. (2013). *Input, interaction, and the second language learner*. Routledge.
- [8] Hopp, H., & Schmid, M. S. (2013). Perceived foreign accent in first language attrition and second language acquisition: The impact of age of acquisition and bilingualism. *Applied Psycholinguistics*, 34(02), 361-394.

- [9] Kaiser, A., Eppenberger, L. S., Smieskova, R., Borgwardt, S., Kuenzli, E., Radue, E. W., ... & Bendfeldt, K. (2015). Age of second language acquisition in multilinguals has an impact on gray matter volume in language-associated brain areas. *Frontiers in psychology*, 6.
- [10] Khodadady, E., & Khajavy, G. H. (2013). Exploring the role of anxiety and motivation in foreign language achievement: A structural equation modeling approach. *Porta Linguarum: revista internacional de didáctica de las lenguas extranjeras*, (20), 269-286.
- [11] Larsen-Freeman, D., & Long, M. H. (2014). *An introduction to second language acquisition research*. Routledge.
- [12] Larson-Hall, J. (2008). Weighing the benefits of studying a foreign language at a younger starting age in a minimal input situation. *Second Language Research*, 24(1), 35-63. Retrieved from http://peer.ccsd.cnrs.fr/docs/00/57/07/38/PDF/PEER_stage2_10.1177%252F0267658307082981.pdf
- [13] Munoz C. (2006). The effects of age on foreign language learning: The BAF Project. In C. Munoz (ed.), *Age and the rate of foreign language learning*. Clevedon: Multilingual Matters, 1-40.
- [14] Munoz, C. (2010). On how age affects foreign language learning. *Advances in Research on Language Acquisition and Teaching*, 39-49. Retrieved from <http://www.enl.auth.gr/gala/14th/Papers/Invited%20Speakers/Munoz.pdf>
- [15] Muñoz, C., & Singleton, D. (2011). A critical review of age-related research on L2 ultimate attainment. *Language Teaching*, 44(01), 1-35.
- [16] Nikolov, M., & Djigunovic, J. M. (2006). Recent research on age, second language acquisition and early foreign language learning. *Annual Review of Applied Linguistics*, 26, 234-260.
- [17] Pfenninger, S. E., & Singleton, D. (2016). The Age Factor in the Foreign Language Class: What Do Learners Think?. *Theory and Practice of Second Language Acquisition*, 1(2), 7-23.
- [18] Saito, K. (2015). The role of age of acquisition in late second language oral proficiency attainment. *Studies in Second Language Acquisition*, 37(04), 713-743.
- [19] Ullman, M. T. (2015). The declarative/procedural model. *Theories in second language acquisition: An introduction*, 135-158.
- [20] Windle, P. (2010). Secondary data analysis: Is it useful and valid. *Journal of PeriAnesthesia Nursing*, 25(5), 322–324.