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AGE AND SECOND LANGUAGE ACQUISITION: CRITICAL PERIOD HYPOTHESIS

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Abstract: *Besides other factors, age plays an important role in second language acquisition (SLA). It is one of the most controversial topics in the field of second language acquisition. Many SLA researchers believe that there is a correlation between age and learning a second language, meaning that age affects learning a second language. This paper aims at exploring the relationship between age and second language acquisition. Particularly, it will discuss effects of age on learning three main domains of a second language: phonology, morphosyntax, and information structure. The review of the studies shows that there is a strong correlation between age and second language acquisition.*

Key words*: Age, second language, impact, critical period hypothesis, language learning*

Introduction

The correlation of age and learning a language, music, and sports has been the topic of research for many years. The majority of researchers have agreed on the existence of a critical period in first language acquisition during which children can fully acquire all the domains of a language. The age effect on second language learning is one of the most controversial topics in the field of second language acquisition. It has attracted the interests of language acquisition researchers since the advancement of Critical Period Hypothesis (CPH) by Eric Lenneberg (Dong & Ren, 2013, Huang 2014). Many re-

searchers also believe that there are other variables like motivation, attitude, socialization, learning style, learning opportunities, and individual differences that affect second language acquisition, and result in different outcomes in individuals (Bley-Vroman, 1990). The nature of effect of critical period is not fully understood although it has been largely studied (Huang, 2014). In this paper I discuss a historical background of the CPH with regard to first language acquisition followed by a discussion of age effects on second language acquisition.

Critical Period Hypothesis: An Overview

Penfield and Roberts are considered to be the first researchers who proposed the age effect on language acquisition. In other words, they believed that children acquire a language better during their childhood than during their adolescent years and adulthood. They argued that the human brain loses its flexibility for learning a language after the age of nine (Tokudome, 2010; Gursoy, 2010). Lenneberg advanced and popularized the Critical Period Hypothesis in his famous book *Biological Foundations of Language* (1967) and he drew the attention of the first language and second language acquisition researchers to the hypothesis. He studied language recovery in aphasic patients (people with language impairments due to injuries or illness), and he observed that it was probable for the speech to recover if the aphasia took place before puberty, but the speech wouldn't recover if it happened after puberty. His reason for non-recoverability of speech after puberty was that lateralization reaches its final stage by the puberty. Based on this observation, Lenneberg concluded that there exists a critical period for language acquisition and he suggested that it could be extended to second language acquisition (Tokodome, 2010).

According to Birdsong (1999), "There is a limited developmental period during which it is possible to acquire a language be it first language or second language, to normal, native-like levels. Once this window of opportunity is passed, however, the ability to learn language declines" (p.1). In other words, proponents of CPH believe that there is a critical period beginning in the very early stage of childhood and ending at the onset of puberty during which children can fully develop a language. According to CPH, for individuals who want to achieve native-like ultimate attainment in a language, they must acquire the language during the critical period and beyond that, it is almost impossible for individuals to achieve native-like proficiency in a language (Tokudome, 2010).

There are two different versions of CPH: The strong version and the weak version. The strong version of CPH states that first language acquisition will not continue beyond puberty even if it begins in childhood. It is similar to the maturational state hypothesis proposed by Johnson and Newport, who claimed that humans possess a special capacity in their childhood to learn a language and this capacity vanishes or declines by puberty. The weak version of the CPH claims that for the language-learning faculty to be able to continue beyond puberty, language acquisition must occur before puberty. This version

is similar to the exercise hypothesis proposed by Johnson and Newport, who claimed that humans have a special faculty for the acquisition of a language in their childhood. Further language learning capacity will continue into adulthood if the faculty is exploited in childhood otherwise it will vanish or decline when children reach puberty. According to both interpretations of CPH, children enjoy a superior ability for language acquisition (Schouten, 2009; Johnson & Newport, 1989).

There are a number of case studies of feral children that researchers have used to support the existence of critical period in the first and second language acquisition. In the 1930s, Isabelle who was confined in a dark room with her deaf-mute mother with no outside contact was discovered at the age of six. She was able to acquire the language within a year and she could speak like her seven-year-old peers (Davis, 1947). Another feral child whose case is extensively cited in the second language acquisition literature is Genie. She was confined in a room when she was 20 months old. She did not have any outside contact by the time she was discovered at the age of 13. She was not exposed to any language and her father barked at her since he thought that she was a dog. She couldn't develop English syntax despite extensive training by linguists and psychologists. She just acquired vocabulary words and produced sentences just like two-year-olds. She couldn't progress beyond this stage (Curtiss, 1977).

Another case study is that of a woman called Chelsea who was born deaf, and a group of doctors mistakenly diagnosed her as retarded. She was not exposed to any type of language. At the age of 31, she was referred to a neurologist who diagnosed her as only deaf. Her hearing ability was corrected to normal with hearing aids. She was able to acquire a large number of words and produce multiword utterances, but she was not even able to produce sentences as Genie did despite extensive rehabilitation. Chelsea would say, for example, "Breakfast eating girl." Her morphology and syntax were worse than Genie's (Curtiss, 1988).

What are the implications of these case studies? Why was Isabelle able to achieve native-like attainment while Genie and Chelsea were not? Besides other factors, researchers concluded that the major reason why Isabelle achieved native-like proficiency was that she was exposed to language before the end of critical period. However, Genie and Chelsea not only failed to attain native-like proficiency despite extensive training and rehabilitation, but they also failed to develop English syntax since they were exposed to language after the critical period was over. Furthermore, Genie learned to produce simple syntactic structures while Chelsea failed to do so (1989). It shows that critical period does not vanish by the onset of puberty, but it declines gradually.

However, some researchers question the existence of a critical period for both first and second language acquisition and argue that these cases are very complex, and they are not considered hard evidence for the existence of a critical period. For example, Aitchison (2008, p. 80) argues that all the cases for the support of termination of the so-called critical period are not sufficient. She questions the three cases and points out that there may be other factors, like brain abnormality, in Genie's and Chelsea's cases who couldn't acquire the syntax. Regarding Isabelle's case, Aitchison believes that her case

was not written by an expert in language and her speech may not have been as sufficient as it was reported. She proposes a sensitive period; a time in childhood during which acquisition of language is far easier and it does not vanish. It will continue into adulthood, but it is not as strong as it is in childhood.

Effects of age on second language acquisition

There is extensive amount of literature on relationship of the Critical Period Hypothesis and second language acquisition. Researchers have studied different aspects of second language acquisition with regard to CPH ranging from phonetics and phonology to morphology to syntax and information structure. I discuss the findings of a number of articles concerning three domains of language: phonology, morphosyntax and information structure followed by discussion of my own experiences in language acquisition.

Phonology

One of the most difficult aspects of learning a second language is mastery of phonology. It is very difficult to achieve native-like accent in a second language if it is learned after puberty. The majority of second language acquisition researchers agree that it is highly unlikely for learners to achieve native-like accent in a second language except that they are exposed to a language in the very early stage of their life. There are many second language speakers with very high proficiency who have learned very complex aspects of second language grammar, but they still have a foreign accent (Schmid and et al., 2014; Granena & Long, 2013). According to Gass and Selinker (2008), there is a general agreement in the second language acquisition literature on the fact that it is highly improbable for older learners to attain native accent in a second language, but such general agreement does not exist in other domains of language (p. 407).

Moyer (1999) studied a group of 24 native speakers of English learning German in order to find out whether age affects final attainment in second language phonology. They were highly motivated to learn German, and they were highly proficient in German. The subjects were graduate students in German at the University of Texas in Austin. They were employed as teachers of the first four semesters in the German program. They were not exposed to German before the termination of the critical period. After puberty, they were exposed to both formal and informal language, meaning that they attended an immersion program and they also received classroom instruction in German. The findings of the study demonstrated that they had nonnative-like accents. She associated this with neurological constraints and argued that "late learners may face neurological or motor skill constraints, such as entrenched articulatory habits or restricted perceptual targets for phonetic category, that render the possibility of native-like attainment unlikely or impossible."

In another study, Schmid, Gilbers, and Nota (2014) investigated second language ultimate attainment in phonetics and grammar in advanced Dutch-English bilinguals. They studied a group of 20 native speakers of Dutch who were learning English and their

level of English was advanced. They were teachers and students at a Dutch institute of higher education. The subjects were between 20 and 60 years old. They selected the subjects based on their near nativeness. All the subjects started learning English when they were 11 years old and none of them was exposed to English before the age of 11. They were highly motivated. Thus, the subjects were homogenous in terms of motivation, age of acquisition and level of education. They also had a control group of nine native speakers of British English who were studying or working in the same institution. The results of the study showed that late second language learners may attain some phonological features of a second language similar to those of natives, but they cannot attain native-like accent, and neither can they overcome foreign accent.

Abu-Rabia and Iliyan (2011) investigated factors that affect accent acquisition. They studied 50 Russian immigrants with different socioeconomic statuses in Israel. They were between 5 and 25 years old when they arrived in Israel. None of them was exposed to Hebrew prior to their arrival. The subjects were students at school and at the university. Three Israeli-born native speakers of Hebrew judged the subjects' accents in both reading and spontaneous talk. The judges did not know anything about Russian and did not have any experience with foreign accents prior to the study. Abu-Rabia and Iliyan concluded that the age of exposure to a language is the most significant variable that affects acquisition of native accent.

In addition, Huang and Jun (2011) investigated the effect of age on acquisition of second language prosody. The subjects of the study included 30 native speakers of Mandarin who learned English in the USA. They lived in the USA for at least five years, and they received formal instruction in English prior to their arrival in the USA. The participants had a college degree or were students at the time of the study. They were divided into three groups depending on their age of arrival: (5-9), (10-17), and (20-26). To provide the native speaker norm, the study had a group of ten native speakers of American English as the control group who were exposed to a foreign language only in high school. The subjects were asked to read out a paragraph of English. Based on the subjects' speech samples, they evaluated rate of speech and production, judgment of native speakers about prosody, and pairings of tones and prosody. The findings of the study demonstrated that early learners of a second language could attain native-like prosody of that language.

However, findings of some studies concluded that it was possible for late second language learners to attain native-like proficiency in a second language including phonology. For example, a study by Bongaerts and et al. (1995) provided evidence against the claim that late second language learners could not achieve native-like proficiency in a second language. They studied three groups of subjects: 10 Dutch learners of English with very high proficiency who were teaching English at a Dutch university, 12 Dutch learners of English with different proficiencies who were studying English at the university, and five British English native speakers as a control group. The Dutch groups were never exposed to formal and informal English before the age of 12. All the sub-

jects had to do four tasks: provide a spontaneous English speech, in which they described their most recent holiday, read aloud a small text, 10 sentences, and a list of 25 English words. Four British native speakers rated the samples of speech. They could not differentiate highly successful learners of English from native speakers, and they treated them as members of the same population. The findings of the study showed that late second language learners could attain native-like pronunciation in a second language.

Morphosyntax

Morphology and Syntax are other aspects of second language acquisition for which many researchers have tried to seek evidence to test the Critical Period Hypothesis. One of the most influential studies is that of Johnson and Newport (1989) in which they investigated the correlation between age and the ultimate attainment in a second language morphosyntax. The participants in the study were 46 native Chinese and Korean speakers who learned English as a second language, and they were between the ages of 3 to 39 when they arrived in the United States. The subjects were divided into early (3-15) and late arrivals (18-39), and the early arrivals were further divided into three groups: (3-7), (8-10), and (11-15). The participants were graduate students, research associates and professors at the time of the study, and they had lived in the USA for many years. The study also had a group of 23 native speakers of English to provide a native speaker norm. The participants were asked to determine the grammaticality of 276 spoken English sentences including 140 ungrammatical sentences, which were supposed to test their knowledge of English morphosyntax. The test consisted of 12 types of rules of English including morphology. The subjects were interviewed for almost half an hour about their language background after the grammaticality judgment test.

The results of the study showed a clear and strong relationship between the age of arrival in the United States and performance in English. Subjects who began acquiring English in the United States at an earlier age obtained higher score on the test than those who began later. That is, the ultimate attainment of group (3-7) was identical with performance of native speakers, the group (8-10) scored lower than the group (3-7). The group (11-15) scored lower than the group (8-10) while they achieved higher scores than the adults (18-39). None of the adults performed like native speakers and younger subjects in general. Johnson and Newport concluded that age of acquisition was correlated with ultimate performance in the grammar of a second language. They argued that age of exposure to a language could predict success in learning a language, and late exposure to a second language prevents ultimate attainment in grammar of that language.

However, Birdsong and Molis (2001) replicated the study of Johnson and Newport using the same methods and materials in the original study. The subjects of the study were 61 native speakers of Spanish. Like Johnson and Newport, they categorized the subjects into early arrivals (younger than 17), and late arrivals (older than 17). All the subjects had lived in the USA for at least 10 years. They were students, faculty or employees at different major universities in the USA, and they had similar education backgrounds as

those in Johnson and Newport's study. All the materials and procedures were the same as those in Johnson and Newport's study. Two of the 276 sentences presented in Johnson and Newport's study were eliminated since the researchers and other native speakers judged them grammatical in certain situations. The study did not find any difference on performance among early arrivals while it found considerable difference on performance among late arrivals. The results of the study also showed that some late learners could achieve native-like proficiency in second language grammar. They attributed the outcome of second language acquisition to similarities between first language and second language, and second language use.

In another study, Newport and Supalla (as cited in Johnson and Newport, 1989 pp. 62-63) found that children have superior capacity to adults for acquiring language. They studied a number of deaf children and they categorized them into three groups based on their age of exposure to American Sign Language (ASL): Native learners who were exposed to ASL from birth; early leaners who were exposed to ASL between the age of four and six, and late learners who were exposed to ASL at the age of 12 or later. They examined the participants on production and apprehension of morphology of verb. The findings of the study demonstrated that native learners performed better than early learners, who performed better than late learners on both tasks: production and apprehension of morphology of verb. They concluded that the capacity to learn a first language declines as children reach puberty. The implication for second language acquisition is that age affects learning a second language.

Huang (2014) investigated age effect on second language grammar and speech production. The study included a group of 118 Chinese native speakers of Mandarin who learned English in the USA. It also had a group of 24 native speakers of English to provide a native speaker norm. The Chinese subjects spoke only Mandarin before the age of five and they were never exposed to English prior to their arrival in the United States. They lived in the USA for at least six years, and they were students or had graduated from college at the time of the study. All of the 24 native speakers of English were monolinguals and they had not been exposed to any foreign language until high school. They were all students and employees at a university in Southern California. The subjects were asked to determine the grammaticality of 112 English sentences derived from previous studies on English morphosyntax. Like Johnson and Newport's study, the test consisted of 12 types of rules of English. The results of the study showed a strong correlation between age and acquiring a second language. It also supported the notion of multiple critical periods, meaning that there is a critical period for every domain of language, e.g., phonology, morphology, syntax, and semantics.

Information Structure

Reichle (2010) investigated age effect on acquisition of a second language information structure (how information, e.g., topic, is packaged within sentences). The study included 26 native speakers of English who learned French. They were at least 18 years old

and the arrival age to a francophone country was between 1 and 35 years of age. They used French as their primary language for at least four years. To provide a native speaker norm, the study had a control group of 44 native speakers of French. In the study, the subjects were asked to determine the acceptability of 60 written exchanges. They were composed of a wide range of syntactic structures aimed to communicate information structure in French. The results of the study showed that age didn't have a great impact on learning information structure in a second language. It also demonstrated that it was possible for late learners to attain native-like proficiency in the domain of information structure. In addition, the study suggested that second language learners could attain native-like proficiency in information structure in a second language in a long-term immersion program.

Conclusion

A large number of researchers have studied the effect of age on second language acquisition from different perspectives and they have tried to seek evidence from different domains of language to support the existence of a critical period in second language acquisition. There are a large number of studies in the second language acquisition literature that support the existence of critical period in second language learning and suggest a strong correlation between age and native-like attainment in a second language. However, researchers do not agree on the extent of age effect on ultimate attainment in a second language. Almost all second language acquisition researchers agree with the fact that late second language learners cannot attain a native-like accent in a second language while there is not such a unified opinion about other areas of language (Gass & Selinker, 2008, p. 407). The literature suggests a critical period for language acquisition beginning in the very early stages of childhood, and its decline is gradual. It also varies across domains of language, i.e., the critical period for phonology declines earlier than the critical period for morphology and syntax (Huang, 2014; Birdsong & Molis, 2001). On the other hand, there are some studies in the second language acquisition literature that have tried to refute the Critical Period Hypothesis and have argued that age does not have any effect on second language acquisition. They have also argued that late second language learners can achieve native-like proficiency in a second language (Bongaerts and et al., 1995).

References

Abu-Rabia S., & Iliyan S. (2001). Factors affecting accent acquisition: The case of Russian immigrants in Israel. *Reading Matrix: An International Online Journal, 11*(2), 160-170

Aitchison, J. (2008). *The articulate mammal: An introduction to psycholinguistics.* New York, NY: Routledge.

Birdsong, David. (1999). Introduction: Whys and why nots of the Critical Period Hypothesis. In *Second Language Acquisition and the Critical Period Hypothesis*. David Birdsong (ed.), 1-22, Mahwah, NJ: Erlbaum.

Birdsong, D., & Molis, M. (2001). On the evidence for maturational effects in second language acquisition. *Journal of Memory and Language*, *44*, 235–249.

Bley-Vroman, R. (1990). The logical problem of second language learning. *Linguistic Analysis*, *20*(1), 3-49.

Bongaerts, T., Planken, B., & Schils, E. (1995). Can late learners attain a native accent in a foreign language? A test of the Critical Period Hypothesis. In D. Singleton & Z. Lengyel (Eds.), *The age factor in second language acquisition* (pp. 30-50). Cleveland, UK: Multilingual Matters.

Curtiss, S. (1977). *Genie: A psycholinguistic study of a modern day "wild child."* New York, NY: Academic Press.

Curtiss, S. (1988). Abnormal language acquisition and the modularity of language. In F. J. Newmeyer, F. J. Newmeyer (Eds.), *Linguistic theory: Extensions and implications* (pp. 96-116). New York, NY: Cambridge University Press.

Curtiss, S. (1989). *The case of Chelsea: A new test case of the critical period for language acquisition*. Manuscript, University of California, Los Angeles.

Davis, K. (1947). Final note on a case of extreme social isolation. *American Journal of Sociology 52*, 432–437.

Dong, G., & Ren, H. (2013). The role of age in second language acquisition – A psychological perspective. *British Journal of English Linguistics*, *1*(1), 1-6.

Gass, M., & Selinker, L. (2008). *Second language acquisition: An introductory course*. New York, NY: Routledge.

Granena, G., & Long, M. (2013). Age of onset, length of residence, language aptitude, and ultimate L2 attainment in three linguistic domains. *Second Language Research, 29*(3), 311-343.

Gursoy, E. (2011). The Critical Period Hypothesis revisited: The implications for current foreign language teaching to young learners. *Journal Of Language Teaching & Research, 2*(4), 757-762.

Huang, B. (2014). The effects of age on second language grammar and speech production. *Journal Of Psycholinguistic Research*, *43*(4), 397-420.

Huang, B. H., & Jun, S-A. (2011). The effect of age on the acquisition of second language prosody. *Language & Speech*, *54*(3), 387-414.

Johnson, J. S., & Newport, E. L. (1989). Critical Period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology*, *21*, 60-99.

Lenneberg, E. (1967). *Biological foundations of language.* New York, NY: Wiley.

Moyer, A. (1999). Ultimate attainment in L2 phonology: The critical factors of age, motivation, and instruction. *Studies in Second Language Acquisition, 21*, 81-108.

Reichle, R. V. (2010). Judgments of information structure in L2 French: Native-like performance and the Critical Period Hypothesis. *IRAL: International Review Of Applied Linguistics In Language Teaching*, *48*(1), 53-85.

Schmid, M. S., Gilbers, S., & Nota, A. (2014). Ultimate attainment in late second language acquisition: Phonetic and grammatical challenges in advanced Dutch–English bilingualism. *Second Language Research, 30*(2), 129–157.

Schouten, A. (2009). The Critical Period Hypothesis: Support, challenge, and reconceptualization. *Teachers College, Columbia University, Working Paper in TESOL & Applied Linguistics, 9*(1), 1-16.

Tokodume, M. (2010). Unlikely Bedfellows: The Critical Period Hypothesis and its effect on second language acquisition. *Texas Papers in Foreign Language Education, 14*(1), 18-27.

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