

Literature review: The effect of starting age on Second Language Acquisition

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Abstract: Age effect has been widely discussed in the field of second language acquisition, from which critical period hypothesis (CPH) has been developed and applied to the research of SLA. What is the optimal timing to start learning a second language (L2)? This article will review the effects of age in two different domains of language: phonology and morphosyntax. By and large, younger learners seem to be able to reach a higher ultimate attainment of L2 learning than their later counterparts in terms of both pronunciation and grammar.

1. Introduction

In views of the rapid development of education nowadays, people tend to pay more attention to foreign language learning than before. In linguistics, the term *Second language acquisition (SLA)*, which is defined as learning a second language after the native language is already established, is used to investigate the process of learning a second language. Up to now, researchers have conducted many studies in the factors influencing SLA, such as age, gender, first language, etc. (i.e. Tohidian 2009; Nelson 2012; Jette 2008) Among all of these, age tends to be one of the most important influencing factors and has been widely discussed. Before going to any further discussion, we need to clarify the concept of *critical period* first since it is closely related to the age effect. A few decades ago, Penfield and Robert (1959) introduced *Critical Period*, a term originated in biology, to language acquisition. They believed that the optimal time for language leaning is before the age of ten, otherwise the plasticity of a child's brain will be formed (Penfield and Robert, 1959). To be more specific, after puberty people will be less effective in language acquisition because of the completion of lateralization of the brain and the loss of brain plasticity (Penfield and Robert, 1959). Under such condition, children have an advantage over the acquisition of language because their brain are not lateralized yet and both sides can work together (ibid). Later then, Lenneberg (1967) supported the view of critical period and reported that the best period for the language acquisition is from the age of two to adolescence. According to Birdsong (1999, p.1), *critical period hypothesis (CPH)* is “a limited developmental period during which it is possible to acquire a language, be it L1 or L2, to normal, native-like levels. Once this window of opportunity is passed, however, the ability to learn language declines”. However, in the past few decades, SLA scholars hold some skeptical attitudes towards CPH like whether it exists or not, what is the specific timing of critical period, etc. (i.e., Asher and Garcia 1969; Johnson and Newport 1989; Birdsong 1999). Even though many studies have affirmed the existence of CPH in first language acquisition, it has still long been debated on whether it can be applied in the field of second language acquisition (Lenneberg, 1967). Till now, researchers have not yet reached a consensus. Therefore, in this article, I will first review and summarize the previous empirical research on age effects of SLA, in terms of which, I will analyse how the ultimate attainment of SLA can be affected by age in the field of phonology and morphosyntax. After that, this article will also discuss whether there is a specific starting age that can achieve optimal results according to the CPH. In the end, I will summarize the outcomes of previous studies to make a conclusion and provide some forward suggestions for the future studies on this topic.

2. Analysis on the age effect of second language acquisition through different domains

2.1 Age effect on phonology

Many studies have reported the importance of age effect in the critical period of SLA in terms of phonology. For example, Asher and Garcia (1969) investigated the accents of English pronunciation of 71 Cuban learners. Their study indicated that the earlier the learners emigrated to the United States, the more likely that they are judged as native-like speakers (Asher and Garcia, 1969). Besides, according to Snow and Hoefnagel-Höhle (1982), adult L2 learners have advantage in pronunciation and learn faster than children. However, this advantage will gradually lose in one year and eventually children will do better than older learners (Snow and Hoefnagel-Höhle, 1982). This means that although adults seem to have a faster rate of learning at first, children can still catch up and surpass them after a short period of time. Long (1990) believed that the optimal time of CPH for acquisition of phonology is around the age of 6 as people at that stage are less likely to be negatively affected by their mother tongue. On the other hand, after the age of 12, it is almost inevitable that most learners will be influenced by the negative transfer of their L1 (Long, 1990). Therefore, compared with adult learners, children are less likely to be affected by their first language because they have not formed a systematic understanding of the mother tongue pronunciation. In other words, starting from an early age is helpful to reach the native-like level in target language.

Meanwhile, Flege (1995) stated that as people grow older, their capacity to discern new contrasts decrease. This is also because learners' phonological system will be strongly fixed when they get older, which is different from the situation at an early age. As a result, he believed that the starting age is negatively correlated to the possibility of perceiving the sounds in second language without the interference of the mother tongue (Flege, 1995). However, Flege came up with a different viewpoint four years after he had proposed such a negative correlation. Flege (1999) argued that the relationship between the age of learning and the acquisition of pronunciation exists but there is no obvious sudden decline or sharp discontinuity at a certain age, which is opposed to the CPH. In a nutshell, Flege concluded that age is a crucial effect in SLA since early L2 learners would be interfered little from their mother tongue. He also emphasised that besides age there are also other significant factors determining the ultimate attainment of L2.

2.2 Age effect on morphosyntax

In the matter of morphosyntax, Patkowski (1980) first reported that one must start learning before the age of fifteen in order to grasp native-like acquisition of syntax in second language. Later, one of the most influential studies on the CPH was organized by Johnson and Newport (1989) in order to find out whether age has effects on the acquisition of morphosyntax. Johnson and Newport (1989) conducted an experiment using Grammaticality judgements (GJs) to measure the proficiency of morphosyntax of Korean and Chinese L2 learners. They divided these participants into four groups according to the arrival age in the United States: three to seven, eight to ten, eleven to twelve and fifteen to thirty-nine, so both early starters and late starters were included. Length of residence (LOR) was also taken into consideration in order to assure their language level, so all of the participants had lived in the United States for at least three years. In this test, people would be asked to judge whether certain sentences are grammatically correct and well-formed. Through answering these questions, the participants' ability to morphology and syntax could be measured. The experiment results reported that there was a strong relationship between the age of arrival and scores on the GJs test—early learners tended to perform like native speakers on GJs but late learners did not. Specifically, Johnson and Newport found that the group ranging from age three to seven performed most similar to native-like level, whereas other age groups were evidently below the native level, especially the group of people over the age of fifteen. Therefore, they reached a conclusion that the optimal timing of starting L2 learning with the possibility to achieve a native-like proficiency level should be before the age of seven.

However, opponents also stated that the acquisition of morphosyntax is not significantly affected by the critical period. For example, Birdsong (1999) also conducted the same experiment as Johnson

and Newport (1989) carried out, but differently, he chose different participants whose mother tongue was Spanish. Now it is important to note that both Spanish and English belong to Indo-European language family, meaning that there is a consistent relationship between L2 and native language. As mentioned above, Johnson and Newport (1989) chose Chinese and Korean speakers as subjects, whose first languages have typological dissimilarities to English. As a consequence of the significant difference in choosing subjects, the results yielded were also different. According to his results, indeed there is a negative correlation between the age of arrival and ultimate attainment. Nevertheless, he believed that the correlation is stronger in the late learners, whereas Johnson and Newport (1989) reported that the correlation is stronger in the early learners. According to CPH, there is a sharp decline in the native-like attainment in terms of age effect and that negative correlation is weaker in the late learners than in early ones (Johnson and Newport 1989). Therefore, Birdsong's (1999) study provided evidence against the CPH in the acquisition of morphology in SLA. Even so, it still provided evidence for the general age effect on SLA and suggestions of participant recruitment. For example, Birdsong (1999) was not a supporter of grouping together both Korean and Chinese speakers as the subjects, so he suggested that all the selected participants should be from the same L1 community, which was exactly what he has carried out in his study. Under this circumstance, Johnson and Newport (1989) might fail to conduct an examination of probable L1 effects as there were more than one variable. Therefore, the differences in morphosyntax proficiency between early learners and late learners might also be attributed to their different mother tongues.

To sum up, the existence of the CPH on the module of morphosyntax has been questioned a lot, as many studies provided counterevidence to CPH. Scovel (1988) claimed that critical period exists and only exists in the acquisition of phonology of SLA. The ultimate attainment of SLA is also affected by factors other than age like the acquisition environment of L2. However, even with all the evidence against CPH in acquisition of morphosyntax, scholars still believe that age is a nonnegligible factor that will affect language learning.

2.3 Age effect on the native-like proficiency of SLA

A great deal of studies has investigated age effects on the achievement of native-like proficiency of SLA, which also raises the controversy of the existence of CPH. For example, Neufeld (1978) tried to challenge CPH through conducting his experiment, in which twenty adult English speakers were asked to take intensive practices to learn the pronunciation of Japanese and Chinese in eighteen hours. Later then, the participants took a test to measure their imitation of pronunciation and the scores of the test were judged by native Japanese and Chinese speakers respectively. As a result, nine of the subjects were regarded as native by Japanese judges and eight of them native by Chinese judges. Neufeld (1978) then reported that adult learners can still reach native-like proficiency in phonology, which is believed to be one of the most difficult domains for adults, as long as certain condition is provided. His study provided another counterevidence for the CPH.

It seems to be somewhat contradictory to confirm the CPH in acquisition of phonology as adults in this experiment still reach native-like proficiency. Nevertheless, this conclusion has been criticized by other scholars who support the existence of CPH. For example, Long (1990, p.281) refuted that the results of Neufeld's experiment were deliberately 'rehearsed' instead of being produced through a natural process, and therefore misled the judges to regard some of the subjects as native speakers. In other words, it was more like particular case rather than natural data, so Long believed that Neufeld's conclusion was only an exception.

3. Conclusion

As reviewed and discussed above, we can reach the following conclusions:

(1) The specific timing for critical period tends to be different in each domain of language acquisition.

(2) In terms of phonology, probably there is a critical period of SLA. As many researches demonstrated that the earlier the learner starts acquisition, the more likely to reach the native-like pronunciation in second language.

(3) As for morphosyntax, critical period hypothesis may not be as obvious as it in phonology, and more evidence is required to further explain it.

(4) Regardless of some evidence against the CPH, age is still believed to significantly relate to the second language acquisition.

As a complex learning process, second language acquisition is influenced by a number of factors, and among all of those factors, age tends to be a significant one.(Zhai 2020; Yang 2017) Also, other factors, such as the environment of acquisition and mother tongue, as discussed above, may cause impact on the L2 learning result as well. Additionally, we need to take as any aspects as possible into consideration and make sure that the variables in the experiment are carefully controlled. Under such conditions, we would be able to avoid the interference of other irrelevant factors so that we could be closer to the more accurate and credible conclusion. Future research is required to better design more meticulous studies to try to explore and answer the long-lasting controversial questions—whether there is a critical period of second language acquisition, and what the specific timing of the critical period is.

Meanwhile, most studies on the age effect and critical period hypothesis of SLA are based on phonology and morphosyntax. There are still many unanswered questions about other influencing factors. Further research on CPH should be undertaken to investigate the aspects other than phonology and morphosyntax in order to have a comprehensive understanding of this topic and carry the research forward.

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