

Critical Period Hypothesis of Second Language Acquisition and Its Implications on the Optimal Starting Age of Foreign Language Teaching in China

Yan Yan

Universiti Pendidikan Sultan Idris, Malaysia

Abstract: *There is a widely-recognized belief held by a vast majority of people to learn a foreign language, that is, “the younger, the better”. However, in the field of SLA, researchers have been debating on the existence of the critical period. This paper firstly introduces what is the critical period hypothesis. Then, this paper summarizes the controversies about the critical period of SLA among different scholars at home and abroad. Finally, according to the different research results at home and abroad and the practice of foreign language teaching in China, this paper puts forward some enlightenment of the critical period hypothesis for SLA to the optimal starting age of foreign language teaching in China.*

Keywords: Critical period hypothesis, SLA, The optimal starting age of foreign language teaching.

1. INTRODUCTION

The Critical Period Hypothesis (CPH for short), also called as “sensitive period”, is not an original concept in the field of language, but a term borrowed and introduced from the field of biology. By definition, it is the period when the external environment has the greatest influence on individual growth and the stimulus is the most sensitive and effective. It’s also considered as the optimal time period to learn all kinds of behaviors. In the field of biology, the earliest observation of Lorenz on newborn goslings showed that goslings would regard the moving object they firstly saw as their mother and produce a strong feeling of attachment, that is, the so-called imprinting. While this kind of imprinting only lasts for a day, and it disappears after 30 hours. Lorenz calls this length of time the critical period (K. Z. Lorenz, 1937). In the field of linguistics, the introduction of “critical period hypothesis” must be attributed to Penfield and Robert, who creatively applied this biological concept to the field of linguistics and proposed “The Optimum age” for language learning (W. Penfield & L. Roberts, 1959). Later, Lenneberg formally put forward the concept of “critical period hypothesis” for the first time in Biological Basis of Language (E. Lenneberg, 1967). General speaking, the “critical period hypothesis” refers to the period in which individuals are extremely sensitive to the influence of external environment and behavior acquisition, which plays a pivotal role in both the first language acquisition and the second language acquisition.

The critical period hypothesis is based on studies of childhood aphasia. After having studied children with unilateral brain injuries and analyzed their recovery of verbal speech after injury, Lenneberg maintained that the reason why young children can normally acquire their mother tongue after suffering from severe brain injury is that the left and right hemispheres of the brain have equal potential for language development during two years after birth, and the language impairment caused by any hemisphere injury can be replaced by the uninjured hemispheres. After puberty (10-12 years old), due to the lateralization of the brain, the human brain used for language processing and learning has matured and the nervous system is no longer flexible, and the language acquisition mechanism of children begins to malfunction, thereby language learning becomes increasingly difficult. In addition, Lenneberg noted that children with congenital mental retardation who receive language training before the age of 14 can make some progress in language ability and master certain vocabulary and perform certain oral orders. But after the age of 14, even with language training, there is no improvement (G. Cui & Y. Zhang, 2002).

2. THE CONTROVERSIES OF CRITICAL PERIOD HYPOTHESIS IN SLA

Lenneberg’s critical period hypothesis is proposed based on the first language acquisition, whether it is applicable to SLA is still uncertain. It is of much necessity to prove whether there is a critical period in SLA. Therefore, a lot

of scholars have carried out a lot of research and debate on this, and there are both supportive voices and opposing voices. Motivation is a crucial element in achieving success, goals, and objectives. The inner drive that propels people to pursue their objectives and maintain their efforts is known as motivation. It serves as the catalyst for action and drive, inspiring people to work hard and pursue their goals. Intrinsic and extrinsic motivation can be distinguished. A person's deep-seated internal desires, passions, and interests are examples of intrinsic motivations. Intrinsic motivation is what motivates someone to keep putting in effort and pursuing greater goals when they are engaged in something they enjoy. Extrinsic motivation, in contrast, comes from outside sources like incentives, admiration, or the desire to avoid punishment. Although extrinsic motivation can spur action, its effects are frequently shorter-lived and less persistent than those of intrinsic motivation. Motivation is significant because it has a beneficial impact on a person's actions and results. Strong motivation increases a person's propensity to persist in the pursuit of their objectives despite obstacles and disappointments. An individual's attention and effectiveness can be enhanced by motivation, which will help them deal with difficulties and conquer hurdles. Nevertheless, motivation is not always constant and can be affected in different ways. The amount of motivation a person has can be influenced by his or her beliefs, objectives, and values. Environmental elements like encouragement and support can also affect someone's motivation. Additionally, a person's experiences and past successes may also influence their level of drive. Therefore, a person's growth and success depend on their ability to comprehend the sources of motivation and how they are produced.

2.1. The pros on the critical period hypothesis

Among the scholars supporting Lenneberg's critical period hypothesis, the experimental study of Johnson and Newport is earlier and more powerful. Johnson and Newport used syntactic judgment as experimental material to orally test 46 native Korean and Chinese speakers who immigrated to the United States at various ages (3-39 years old) on their mastery of English grammar in a native-speaker environment. The results showed that there was no significant difference between the English level of the subjects who moved to the United States at the age of 3-7 and the native people. While the English level of the subjects who immigrated to the United States between the ages of 8 and 16 decreased along with the increase of age. Subjects who moved to the US after age 16 had far worse language skills than other age groups, and their performance was not directly related to age. The experiment showed that the time period of residence had no significant effect on SLA. Therefore, Johnson and Newport concluded that age has an effect on SLA and the critical period exists (J. S. Johnson & E. L. Newport, 1989).

Johnson and Newport further confirmed the existence of the critical period in language acquisition. In this experiment, they used syntactic judgment as experimental test materials. Through the comparison of two groups of Chinese adults and 4-16 years old who came to the United States to live and study English, the experiment's results show that the younger the age of subjects who arrived in the United States to learn English is, the better the test scores are. Conversely, the older the age of subjects arriving in the United States is, the worse their scores are. This suggests that the younger the age at which foreign language learning begins, foreign language acquisition is less influenced by native grammar. If one starts to learn a foreign language as an adult, he will be greatly influenced by the grammar of mother tongue (J. S. Johnson & E. L. Newport, 1991).

Later, Johnson repeated the experiment of Johnson and Newport in 1989. The results showed that the language level of the subjects who immigrated to the United States before the age of 7 had no significant difference with the native. While, among the subjects who moved to the United States from the age of 7 to the age of 15, their degree of grammar mastery began to decline, and their English proficiency clearly showed the decline brought by puberty (J. S. Johnson, 1992). It is worth noting, however, Johnson found that the decline in language learning begins at the age of 7, rather than puberty. As Lenneberg would suggest that when the critical period begins, if it exists, is a matter of debate. This experiment provides strong scientific support for the existence of the critical period hypothesis. At the same time, Chomsky's interpretation of the complex language structure acquired by children by universal grammar also provides theoretical support for Lenneberg's hypothesis of the critical period of language acquisition.

Among the domestic scholars, Chen Baoguo and Peng Danling hold a supporting standpoint for critical period hypothesis. They agree that age, to some extent, has a certain influence on the effect of SLA, but they also oppose to overemphasizing the influence of age on SLA and highlight the importance of comprehensive factors (B.G. Chen & D.L. Peng, 2001).

2.2. The cons on the critical period hypothesis

There are some scholars questioning the critical period hypothesis of language acquisition. Birdsong refuted the existence of the critical period of SLA by studying the learners' learning situation of second language. He used sentence judgment as experimental material to test English-speaking French learners as a second language. In general, although older adult learners are not as advantaged as younger learners, some of those who start to learn French after puberty are as good at syntactic judgment as native speakers, suggesting that age is not an absolute factor in determining the success of foreign language learning (D. Birdsong, 1992). In 2001, Birdsong and Molis directly repeated the experimental study of Johnson and Newport in 1989, but failed to get the same results. In Birdsong's and Molis's experiments, other parts of the experiment, such as the materials and methods, were identical, except that the subjects were different from Johnson and Newport's. Birdsong and Molis's subjects were native Spanish speakers of American immigrants, while Johnson and Newport's subjects were native Korean or Chinese speakers. Birdsong and Molis found that subjects who moved to America after puberty were as likely to be as good at English as native speakers (D. Birdsong & M. Molis, 2001). It is contrary to the second condition of the critical period hypothesis. This experimental study may cast doubt and uncertainty on the existence of the critical period hypothesis.

Meanwhile, Hakuta believes that there are at least the following four conditions be satisfied so as to prove the existence of the critical period. First, the critical period should have a clear and fixed start and end time. Second, language acquisition after the critical period is almost impossible to show similar or the same language level as during the critical period. Thirdly, there should be a qualitative difference between the language behavior in the critical period and that before and after the critical period. Fourth, during the critical period, the environmental factors should not have a great influence on the phonological acquisition of the second language. In other words, during the critical period, as long as there is the most basic language contact, one can acquire or learn language regardless of the natural environment or the unnatural environment (K. A. Hakuta, 1999). According to the first basic condition of the critical period hypothesis, it is necessary to have a clear start and end time, but researchers cannot reach a consensus on the start time of the critical period. Lenneberg thinks it's from age 2 to puberty. Johnson and Newport put the critical period before the age of 7. The various research results add some doubt to the feasibility of the critical period hypothesis of SLA.

Fledge, except for using Johnson and Newport's original grammar test, tested 240 Korean native speakers on English pronunciation. The results show that pronunciation is more easily affected by the age of second language learning than syntax. The older the subjects arriving in the United States are, the more "foreign accent" they assumed when speaking English. Researchers believe that the critical period is related to second language pronunciation, but not to grammar (J. E. Fledge, 1999). This further demonstrates that the complexity of language and language acquisition cannot be fully explained by the critical period hypothesis.

There are some domestic scholars holding a converse standpoint with regard to the critical period hypothesis. In psycholinguistics, Gui Shichun pointed out that it is difficult to give an exact optimal age for foreign language acquisition, but at the same time, he also proposed a new perspective, that is, focusing on the characteristics of different stages of learning and applying them to foreign language teaching. Gui Shichun's point of view circumvents the crux of previous studies and combine relevant research and teaching in the critical period of SLA, opening up a new situation and direction of research (S.C. Gui, 1985). In addition, Dai Weidong and Shu Dingfang hold the same view. They believe that the effect of foreign language acquisition has no absolutely correlation with the age, and emphasize that the existence of the critical period hypothesis lacks clear and convincing empirical data and proof. In terms of language acquisition, although the initial age has some influence, the final effect of pronunciation acquisition is also determined by various reasons (W.D. Dai & D.F. Shu, 1994). According to D. H. Schunk et al. (2012), motivation is "the process by which goal-directed activities are instigated and sustained[1]." While there are others, the following four ideas are highlighted in this definition: Motivation is a process that deals with the beginning and continuation of activity aimed at reaching a goal. It is goal-focused. Pintrich (2003) outlined seven major research issues for motivation and general research criteria to follow while examining these questions[2]. Additionally, motivation is not a monolithic concept. Although it might seem clear, lay educators and academics frequently refer to "motivation" without being precise about a theory or conceptual framework. Each theory promotes a distinct facet of motivation, a different stage of learning, a different set of learning tasks, and a different set of outcomes, although they rarely directly contradict one another. It might be difficult to gauge the success of motivational research. Results (and thus implications) for mastery and performance-approach goal orientations, for instance, vary for various outcomes. Choice of tasks, effort, persistence, and achievement were recognised as the four general motivation outcomes by Schunk (2012), who also offered techniques for measuring each of them. Additionally, students can rate how motivating they think a course is. According to Cook, D. A., et al. (2009), the theory and the research topic will determine which result(s) are most pertinent to a particular study[3].

For each outcome, there are often a number of measurement techniques and particular instruments, each with advantages and disadvantages. Self-report measures, on the other hand, are constrained by the accuracy of self-perceptions, whereas behaviour-focused measures downplay the significance of cognitive processes. According to Cook, D. A., et al. (2015), evidence to support the validity of scores for all instruments should be consciously designed, gathered, and assessed[4]. Researchers should also investigate how well incentive theory works in real-world situations. Understanding seemingly incongruent findings may be made easier by connecting motivational concepts with certain cognitive processes (Harris, K. R. et al., 2012)[5]. To comprehend conceptual nuances, current data, prospective interactions, significant outcomes, and timely issues, researchers are encouraged to further examine theory-specific literature (Cook, D. A., 2014)[6].

3. THE IMPLICATIONS OF THE CRITICAL PERIOD HYPOTHESIS ON FOREIGN LANGUAGE TEACHING IN CHINA

In recent years, foreign language teaching in many areas of our country shows a trend of younger age, the first grade of primary school and even kindergarten began to set up English courses, some social training schools are trying to exaggerate the benefits of early English learning. Affected by such a big environment, due to being afraid that their children lost in the starting line, parents have to believe this kind of one-sided propaganda that the earlier foreign language learning begins, the better the effect of foreign language learning is. Obviously, this foreign language craze is largely based on the critical period hypothesis of language acquisition. Actually, it is an indisputable fact that the current foreign language teaching at a young age has insufficient theoretical basis and teaching practice experience. Even if there is such a critical period, age is only one of the factors affecting foreign language learning, and its explanatory power on learners' SLA level is limited. Only various factors can determine the optimal effect of foreign language learning.

3.1. Handle the relationship of mother tongue and second language correctly

The level of foreign language that one can achieve is basically equal to the bottom line of his native language. For a learner, there is no foreign language without a mother tongue. Without the cognitive and logical thinking skills developed in the native language environment, it is impossible to really learn a foreign language well. In this case, learning the second language too early will inevitably produce negative impact to learners, such as interfering to the thinking of mother tongue acquisition, bringing more language mistakes hard to correct, and bring heavy burden to students etc. For the reason, it is of great significance to consider the advice that mother tongue acquisition should precede second language acquisition and foreign language learning should not be at the cost of sacrificing or weakening mother tongue. In Piaget's view, children in the preoperational stage (2-7 years old) tend to use a kind of language. At this time, if learning another language, they tend to confuse the two languages, unable to express correctly, thereby producing a certain frustration for children and being harmful to their future study. Therefore, if children in this period do not live in a bilingual social environment or have absolutely excellent teachers and complete teaching facilities, it is better to use one language (C.M. Wang, 1990).

3.2. Handle the relationship of language acquisition and culture acquisition correctly

Language learning is essentially a process of cultural acquisition. It is impossible to master a foreign language without a proper cultural environment. The difference between Chinese culture and British and American culture is another big obstacle for Chinese students to learn English well. If a child starts learning a foreign language at an early age, it is easy to cause the confusion between the native culture and the foreign culture. As we know, language is the carrier of culture and the symbol of a nation. The learning process of mother tongue is a socialized process. While learning a language, children also learn a way to observe the world and adapt to the society. Values and standards of conduct will creep into their minds, so it is irrational not to teach them in their mother tongue. In this regard, Malmberg has a very insightful and profound statement: "Mother tongue is extremely indispensable for the cultural development of individuals. In the early stages of education, individuals are firstly introduced into the culture of their own people, then into the international culture and into the abstract world, all of which must be carried out in the environment of their mother tongue" (G. Malmberg, 1970). Therefore, to some extent, learning English much too earlier will affect the learning of Chinese, which is not conducive to the inheritance of Chinese culture.

3.3. Handle the relationship of optimal starting age and foreign language acquisition correctly

Language acquisition is a systematic and complex process. When studying language acquisition, we are supposed

to not only consider the age factor, but also comprehensively take other factors that affect language acquisition into account, such as individual differences, learning attitudes, learning objectives and surrounding language environment etc. With regard to learning a foreign language, different age groups have distinct advantages.

Children have no absolute advantage in the foreign language learning. The advantage of children in SLA is the plasticity of children's brain, especially in the acquisition of natural pronunciation. Littlewood made some explanations about the overall advantages of children's SLA: (1) Children generally have more favorable learning conditions. They are often exposed to language for a longer period of time, and get higher attention from other children, their elders and some native speakers of the target language. (2) The language that children are exposed may be simpler, that is, simple codes or indicative speech, which is easy to understand and process. (3) Children usually do not have a negative attitude towards other speech groups, nor are they aware of other related factors, so the "social-emotional screen barrier" is relatively not obvious. (4) Adults tend to consciously think and analyze learning experiences, which may hinder the function of the natural processing mechanisms that internalize new languages. Older learners rely too much on learning, while children are willing to let the language acquisition go naturally (Littlewood,1984).

Adults may also be better at acquisition than children due to some factors such as learning ability. Ekstrand (1976) believed that language learning ability would increase together with age just like intelligence, and the development of universal cognition, second language learning, basic learning mechanisms, perception, mimicry, and social learning also increase along with age. He argued that the more developed the brain is between the ages of 8 and 16, the better suited it is to learn a second language. Intellectual, perceptual and kinesthetic development may facilitate the improvement of language learning ability (L. H. Ekstrand,1976).

Therefore, the beginning of foreign language learning is not necessarily related to the success or failure of foreign language learning. Age is only one of multifaceted factors in the whole process of foreign language learning, not a decisive factor.

4. CONCLUSIONS

From what has been discussed above, many scholars at home and abroad conducted studies from multifaceted dimensions and in different ways, and it has not been concluded whether there is a "critical period" for SLA. Therefore, its application in the practical field of foreign language teaching should be considered comprehensively according to the students' individual difference, learning ability, learning attitude and learning environment. Besides, the influence of "critical period" on SLA should not be overemphasized. Since it maybe violates the rules of language acquisition, thereby bringing negative effects. Under the current circumstances, to learn a second language too early is bound to have negative effects on learners, such as causing the interference in the thinking of mother tongue acquisition, language errors that are hard to correct, and heavy burdens on students. Therefore, the optimal starting age of SLA that is later than the acquisition of mother tongue should be considered.

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