

An Introduction to Critical Period Hypothesis in Second Language Acquisition

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Abstract: The author writes this paper to present the generalization of critical period hypothesis and to illustrate the main opinions towards it. To begin with, the author explains the creation of critical period hypothesis, from the perspective of neurolinguistics and Universal Grammar. Secondly, the author summarizes and demonstrates the fundamental opinions to critical period hypothesis, for theories which are in favor of and are against it, and in different degree, namely, the radical and the mild. In this part, the author elaborates these matters from the points as language multiple-levels, the process and route of second language acquisition, the proficiency of second language acquisition, mother tongue's transfer, empirical studies about second language acquisition and some general doubts. Together with these, the author also displays some of her own thoughts on certain standpoints. At last, the author concludes that people are born with the ability to acquire second language, but the proficiency and ultimate attainment of second language acquisition may depend on initial age, besides, the author also delivers that the existence of critical period on second language acquisition is hard to assure through examination.

Keywords: critical period hypothesis; theories of the proponents; doctrines of the opponents

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Critical period hypothesis on second language acquisition is a controversial and unresolved matter. Introduced from critical period for first language acquisition, this issue has been discussed for more than fifty years; both approvals and opponents have stood out and developed their theories. From early up to now, abroad to inside, related fields have been researched from language multiple-levels to sociolinguistics, psycholinguistic, cognitive linguistics and language processing models. In addition, examination methods have been extended from tape-recorders, human beings judgments to fMRI. Also, subjects have been diversified; they have been children and adults with different ages, native speakers and immigrants, with manifold first and second languages. Furthermore, examining time has lasted from several months to several years.

This paper generally displays the originality of critical period hypothesis in second language acquisition, different schools' opinions upon it and some author's self commentary. As for the structure of this paper, this paper firstly puts forward the originality of the critical period hypothesis in second language acquisition, such as the neurolinguistics perspective, and the Universal Grammar perspective.

Secondly, this paper also discusses the issue of the critical period hypothesis problem in second language field from the point of view as the approval schools. As for this part, the author of this paper also discusses the issue of the critical period hypothesis problem in second language field from the radical approval schools and the mild approval schools. As for the former, this paper discusses the issue of the critical period hypothesis in second language acquisition mainly from the point of views as the multiple-levels of second language acquisition and the process of second language acquisition. As for the mild schools, the author of this paper also discusses the issue of the critical period hypothesis in second language acquisition from the perspective of multiple-levels of second language acquisition, the generalization, the mother tongue's influence on second language, and some empirical study.

Thirdly, the author of this paper discusses the issue of critical period hypothesis in second language acquisition from the perspective of opponent schools. This paper also discusses the issue from the point of view as radical schools and the mild schools. As for the former part, this paper mainly discusses the issue of the critical period hypothesis in second language acquisition from the perspective of general doubts, proficiency of second language acquisition, mother tongue and route of second language acquisition. As for the mild schools, this paper mainly discusses the problem from the perspective of phonology.

1 The Originality of Critical Period Hypothesis in Second Language Acquisition

1.1 Neurolinguistics

Penfield and Roberts firstly (as cited in M. Jiang, X.Y. Deng & P.Y. Ou, 2010, p.11) mentioned the concept of critical period in first language acquisition as the optimum age in 1959. As they believed, the existence of critical period was caused by the lateralization of human brain. Fromkin and Rodman (as cited in Z.Q. Liu, 2003, p.158) also considered, at beginning, human beings processed language with both hemispheres, after lateralization, the area in right hemisphere which processed language disappeared and people mainly used left hemisphere to work out language. Ellis (as cited in X.Y. Lu, 2004, p.62), too, thought human beings would lose the ability to deal with language input after the critical period. Later on, scholars introduced this concept into the acquisition of second language and foreign language learning.

1.2 Universal Grammar

As for first language acquisition, Snow (1972) studied characteristics of mothers' speeches (first language), which were said to children younger about two years old and older about ten. To younger children, mothers' speeches were simpler in structure, and vocabularies were with more repetition. For the aspect of structure, these speeches only composed of subjects, predicates and objects, as for vocabulary, these speeches mainly adopted directive words such as nouns. All of these proved that children had self learning ability on language acquisition but

it was incomplete. Thus, children could internalize syntax rules through input but only through receiving those sentences with clear composition. While to older children, mother's speeches were elaborated, complicate, with more pronouns, and less repetition. This on one aspect demonstrated children inherently possessed LAD. They could acquire language through comprehensive input and on the other hand illustrated that language acquisition ability changed with time. From a certain point, this survey certificated the existence of critical period in first language acquisition (Snow, 1972).

Extending into second language acquisition, as Chomsky's principles and parameters theories explained, principles were common characters of all languages, and parameters were the concrete exemplifications of these principles in detailed language, unique and different. One researcher, Birdsong, (as cited in Z. Q. Liu, 2003, p.159) pointed out that after critical period, although adults still possessed principles, they cannot activate principles as children did, and thus had problems on parameters acquisition.

2 Different Voices to Critical Period Hypothesis in Second Language Acquisition

2.1 The Approval

2.1.1 The Radical School

(1) Multiple-levels of second language acquisition.

In the part of phonology, Tatha, Wood and Loewenthal (as cited in Larsen-Freeman & Long, 2000, p.156) in 1981, tested 231 English school children aged between five to fifteen, asked them to replicate French and Armenian pronunciation of single words. The research found their ability to imitate intonation declined with age, especially, dropped at eight to eleven.

In the aspect of syntax and vocabulary, Johnson and Newport (as cited in K. Xin & S. L. Zhou, 2006, p.80; M. Jiang et al., 2010, p.12; L. R. Yang, 2004, p.102) in 1989 and 1991 examined their subjects, Chinese and Korean immigrants with average second language learning length of 10 years, results showed that among whom started learn English before seven got higher scores in grammar questions tests than those who began later, and early beginners' English levels were closer to native speakers.

As for pragmatics, Devenney (as cited in Larsen-Freeman & Long, 2000, p.163), made a small-scale study and predicted that age-about issues would be found in the field of conversational strategies such as topic pinning.

In semantics and grammar, Christine Weber-Fox and Helen Neville (as cited in G.W. Hao, L.R. Yang & Y. Lai, 2007, p.82) in 1999, conducted their survey from points of behaviorism and electrophysiology. Analyzing Chinese English learners' self English level reports, grammar test grades and brain activities, they concluded that human beings' ability in handling semantics fell with increase of age. In addition, their left brain degenerated with time, and right brain participate more in the process of syntax working-out, which partly proved the correctness of lateralization. Furthermore, Watenburger (as cited in M. Jiang et al., 2010, p.13) in 2003, used FMRI to test people's cerebral cortex activity when they used second language to make grammar and semantics judgments. Research showed that age influenced cerebral cortex activity only when people made grammar judgments. It was discovered that second language acquirers and native-speakers activated same areas to work out grammar before age six, but after age six, second language learners activated more brain areas than native-speakers.

(2) The process of second language acquisition.

One researcher, Riney, (as cited in Ellis, 1994) in 1980, studied Vietnamese learners of English, his findings displayed that age obviously affected English pronunciation acquisition, brought about epenthesis. This phenomenon happened less than five percent in children aged between ten to twelve, but more than thirty percent in some adults. More importantly, this lack cannot be improved with more exposure to English.

2.1.2 The Mild School

(1) Multiple-levels of second language acquisition.

Oyama (1976) brought forward sensitive period hypothesis.

In the field of phonology, early in 1969, Asher and Garcia (as cited in Larsen-Freeman & Long, 2000, p.158), conducted an examination requiring Cuban students in USA to repeat English sentences, research exhibited that students whose AO (age of arrival) were six tested to be the most native-like, followed by seven to twelve and then thirteen to nineteen. Oyama (as cited in Larsen-Freeman & Long, 2000, p.158) studied pronunciation capabilities of Italian immigrants in 1976, she observed that age of arrival affected more than length of residence on the proficiency of second language acquisition. Major (as cited in Larsen-Freeman & Long, 2000, p.158) in 1987 examined the pronunciation of certain English phonemes with adults Brazilian Portuguese speakers contrasting with some native speakers, the native speaker judges gave all the formers scores lower than the last advanced later.

The author of this article declared a doubt on this point of view, as for Oyama had pointed out, if people acquired second language phonology after age of twelve, then they couldn't reach the level of native speakers. But from the observation of the author, for people who were good at singing or received music training in childhood outperformed in acquisition of phonology even when they exposed to second language after critical period. Of course, those students may were the exceptions, their detailed situation for English learning, such as steady pronunciation performance and judgment standards need further to be investigated, this was only the most preliminary speculation of the author without deep research.

For Syntax, there was a scholar M. Patkowski (as cited in C.M. Dai, 1994, 19) in 1980, examined sixty-seven Russian immigrants as English learners, with length of residence more than five years, he found that the complete acquisition ability was limited with age and twelve to fifteen was the best age to initiate second language learning.

(2) Generalization

Littlewood (as cited in K. Xin & L. S. Zhou, 2006, p.81) in 1984 claimed that children concentrated better and received simpler input

than adults.

Liu Runqing (L. R. Yang & Z. D. Zhang, 2007, p.129) in 1990 said that the most proper age for second language acquisition was about nine years old.

Gui Shichun (as cited in L.R. Yang & D.L. Zhang, 2007, p.129) in 1992 pointed out that with suitable environment, early exposures to second language were better than later ones.

Equally, Larsen-Freeman and Long (as cited in K. Xin & L.S. Zhou, 2006, p.81) in 2000, observed immersion teaching of French in Canada, they unfolded that nine years old was the best age to initiate second language acquisition.

(3) Mother tongue's influence on second language

As Collier in 1987 and 1988 declared, the critical period was ascertained at eight to eleven. Before this stage, children's first language structure was incomplete, and mother tongue transfer negatively affected on the second language acquisition. At this period, the academic skills developed through the usage of mother tongue was applied to study other subjects and to absorb new information. Certainly, these skills will also embed into the process of second language acquisition and made it more successful.

The author of this essay agreed that the formation and perfection of mother tongue system affected positively on second language acquisition. Supposed people started second language acquisition earlier, those two language systems would adulterate with each other and none of the language would be acquired successfully. Otherwise, the academic skills cultivated through usage of mother tongue would assist children in learning second language as a branch and assured the success of acquisition. But since there was not a clear and coincident starting point for critical period, although it was obstructive to begin the second language acquisition too early, whether people still cannot reach high levels after age of 12 as Collier proposed?

(4) Empirical study

For the investigation conducted by K. Xin and L.S. Zhou in 2006, collected and analyzed comprehensive English scores of graduates in non-English majors. They found out that students who began studied English at age about ten were more excellent than those who exposed to English later (K. Xin & L.S. Zhou, 2006). Back up to 2004, X. Y. Lu arrived at a same conclusion (X. Y. Lu, 2004).

2.2 The Opposition

2.2.1 The Radical School

(1) General Doubts

For Krashen (as cited in R.L. Yang, 2004, p.103) believed that the lateralization finished at the age of 5.

As Kinsbourne (as cited in R.L. Yang, 2004, p.103) accounted that lateralization was the increase of language strategies with age.

One researcher (as cited in Z.Q. Liu, 2003, p.162) declared several doubts about critical period hypothesis. Firstly, it was unclear which period was the critical period in second language acquisition, secondly, study showed that there was no obvious discontinuity in second language proficiency when critical period ended. Secondly, he suggested that environmental factors were more influential than age. For the very first question posed above, controversial existed, Lenneberg put forward that the critical period was from two to adolescence, but Pinker thought it was from six to adolescence, as Penfield considered it was from born to nine years old, and Johnson and Newport believed it was from born until fifteen.

In a 2003 article, Hakuta, Bialystok and Wiley tested whether there was a discontinuity at certain points of age, the result showed that there was no such evidence. Instead, the proficiency degree would decline with age, which was considered in line with cognition regularity.

Back in 1985, Chinese State Education Commission conducted a nation-scale survey, test showed that Beijing and Tianjing's students, who were required to learn English at nine, their test scores were lower than those students in Jilin, Hubei and Anhui, who were compulsorily asked to study at age of thirteen. R.L. Yang (2004) thought that students' degree of attention, attitudes and methods, levels of teaching staff, and teaching plans were more determined than age on second language acquisition.

Long (as cited in M. Jing et al., 2010, p.13), considered that children were better acquirers in communicative situation while adults were better at classroom learning. Researchers Sur, Pallas and Roe (as cited in F. Genesee, 2000, p.202) declared that if people received visual input, then the area in brain controlling visual information process would be activated, not the auditory ones. In other words, the kinds of sensory input factored the specialization of brain areas and certain processing capability. In addition, F. Genesee (2010) said that learning information would stimulate the production of new, more, and complex connections between neurons, not only the adjacent ones, but also the distant ones. These opposed the theory of lateralization and considered lateralization was caused by receiving different kinds of input. Besides, constant learning would enable the brain to build more connections assisting learning.

D.F. Shu and Z.X. Zhuang (as cited in R.L. Yang, 2007, p.129) believed that one may succeed on second language acquiring whenever he or she began acquisition, besides, they thought there were no obvious superiorities for students who started second language acquisition at primary school.

(2) Proficiency of second language acquisition

The scholar (as cited in L.F. Wang & Y. Li, 2002, p.78) brought out the Speech Learning Model, as critical period hypothesis supposed there should be a linear relationship between age and foreign accents, but the result illustrated the proficiency line didn't drop at certain age points.

(3) Mother tongue and second language

Birdsong repeated the examination did by Johnson and Newport (as cited in M. Jing et al., 2010, p.14), he investigated that the similarity between mother tongue and second language importantly functioned to the ultimate attainment of second language acquisition.

(4) Route of second language acquisition

Bailsy et al (as cited in Ellis, 1985, p.105) dig out that adults and children's acquisition orders of the same sets of grammatical morphemes were similar.

Fathman (as cited in Ellis, 1985, p.105) discovered that orders of acquisition in grammatical items kept constant in children aged from six to fifteen.

Ekstrand (as cited in Larsen-Freeman & H. Long, 2000, p.157) examined students aged between eight to seventeen, who studied Swedish as second language lasting for two years, demonstrated that the degree of second language proficiency growing with age and older children outperformed on methods of acquisition.

2.2.2 Mild School

One researcher Neufeld (as cited in Larsen-Freeman & H. Long, 2000, p.159) arranged twenty English adults as subjects, who received intensive instruction on Chinese and Japanese phonology. Neufeld required native speakers as judges to listen to subjects' and some native speakers' statements on tape-recorders, after hearing their tapes, judges misled some non-native speakers as native ones.

Thompson (as cited in Ellis, 1994, p.487) examined issues of accents. In his research he tested Russian immigrants as subjects. He found that those immigrants who arrived at America before age of ten had more English-like accents, but there were also exceptions, two subjects. Though their arrived ages were four, they had slight accents of Russian in their English pronunciations. Thompson considered it was caused by the very high first language proficiency transferring on the acquisition of second language.

3 Conclusion

In conclusion, critical period hypothesis on second language acquisition is an essential and study-worthy issue, if it is proved, whether to be tenable or not, will enrich the theories on second language acquisition, benefit language acquirers, assist language teaching and improve the quality of language learning. This essay demonstrates the main theories towards critical period hypothesis. From these on, may the author concluded that age related problems are difficult to conduct experiments with controlling variables. Besides, results and judgments are subjective. The author thinks that human beings inborn with the capability to acquire language, whether it is second language, first one or the third, but the proficiency of second language acquisition may relates to age. This is according to the human beings' cognitive regulations, especially those acquisitions could be acquired through communicative situations, not the classroom learning. From this point of view, the author considers mother tongue transfer on second language learning would be an interesting and instrumental topic to talk over on critical period hypothesis.

As for the limitations of this paper, firstly, it does not cover enough dimensions to discuss the issue about the critical period hypothesis in second language acquisition, such as the issues of the initial rate, the ultimate attainment and etc are not covered in this thesis. Secondly, about the issues discussed in this paper, some of them are not discussed deep enough. Some of them are just discussed on superficial without enough analysis and discussion.

As for the implications for this paper, this paper mainly summarizes the different opinions of various schools to the issue about the critical period hypothesis in second language acquisition. This paper could provide some reference for the following scholars who want to do further researches about the issues of critical period hypothesis in second language acquisition. In addition, this paper also could provide a modal as to the followers who want to do the review research, as for these scholars, this paper could provide an analysis and discussion route for these scholars when they want to complete a review study. Thirdly, this paper also could stimulate the further discussion for the scholars who had already conducted some researches in this field, namely as the critical period hypothesis in second language acquisition. Some issues such as the mother tongue transfer and artificial intelligence influencing and influenced in the critical period hypothesis in second language acquisition might become the new research interests for them.

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