

A Study on the Relationship between Age Onset of English Learning and English Achievement

Meihua Wang

School of Foreign Languages, Inner Mongolia University for the Nationalities, Tongliao, China

Abstract—In spite of the same learning environment and teaching resources, the achievement of different second language learners is varied. Because of their different achievement, much emphasis was put on the study of the learners' individual differences. Undeniably, the superiority of the younger learners to the older learners in the second language acquisition has been a hot research topic. This study sets out to explore the relationship between the age onset of second language acquisition and its relative achievements. An investigation was made through a questionnaire to identify the subjects' age onset of English learning, and then an archival study was performed to compare the achievements of the learners with different age onset. The original scores of the subjects' College Entrance Examination, and College English Test (band 4) were taken as raw data for statistics analysis. The result indicates that there is significant difference among different types of subjects with different age onset and the achievements of second language acquisition. Meanwhile, the author also tries to explore the possible reasons that could account for the differences among different groups. The results are of some significance in deciding the age onset for a child to learn a foreign language.

Index Terms—critical period hypothesis, second language acquisition, age onset

I. INTRODUCTION

It is a fact that second language learners vary enormously in what they actually succeed in learning, which has become one of the major conundrums in the SLA field. So some explanations are explored to account for the differential success, such as native language variables, input variables, instructional variables and individual variables which include age, language aptitude, motivation, learning styles, strategies, personality and so on. Since second language learners begin acquiring the language at a later age than do first language learners, age has been often considered a major, if not the primary, factor in determining their success in learning a second or foreign language. The research on age factor has always been one of the issues in SLA. The study on age of language learning has an important theoretical significance and as well as a practical significance.

The idea that there is an age factor in language development has long been, and continues to be, a hotly debated topic. In the past, apparently incompatible contrasts between young children and older learners had affected the formulation of generalizations about age-related differences in language learning: the fact that with exposure, young children become more native-like on all linguistic measures than their older counterparts, and the fact that older learners acquire second languages faster than young children. These apparent conflicts are resolved once short-term learning (rate) is distinguished from long-term learning (ultimate attainment).

Among the theories and hypotheses, a very controversial one about second language acquisition is the Critical Period Hypothesis by Lenneberg (1967), who states that there is a period when language acquisition can take place naturally and effortlessly, but after a certain age, the brain is no longer able to process language input in this way (Ellis, 1999: 484). The Critical Period Hypothesis was such a theory that attempted to provide a biological foundation to explain the pervasive "younger is better" myth concerning language acquisition. According to the Critical Period Hypothesis, there exists a common conception that the younger the children start to learn a foreign language, the better they will learn the language.

The thesis consists of five chapters. After the introduction in Chapter 1, the second chapter is about the literature review: previous research findings by the researchers home and abroad as well as the arguments and studies of CPH in the field of SLA. The third chapter investigates the relationship between the learners' age onset of SLA and its relative achievements by statistics collecting and analyzing. Discussions and reasons for the differences between different groups of learners are reached in the fourth chapter. The final chapter is the conclusion of the paper and some suggestion and implication for the starting age of teaching English in China.

II. LITERATURE REVIEW

A. Critical Period Hypothesis

The achievement of foreign language learners varies on a number of dimensions relating to age. Age is one of general factors contributing to individual differences in second or foreign language learning, and the Critical Period Hypothesis also has great effects on foreign language learning. The Critical Period Hypothesis was first put forward by Penfield and

Roberts (1959). It was developed to second language acquisition by Lenneberg in 1967. It was introduced to second language acquisition later. According to the Critical Period Hypothesis, there is a period during which language learners can acquire a second language easily and achieve native-speaker competence, but that after the period second language acquisition becomes more difficult and is rarely successful. Researchers differ over when this critical period comes to an end (Ellis, 1999). Since then, the factor of starting age in learning foreign language becomes one of key research points.

B. Supports for Critical Period Hypothesis

The scholars who support the view include Oyama (1976), Coppiters (1987), Patkowski(1980, 1990), etc. They reached a comprehensive conclusion of age factor: when the hypothesis that the children starting second language earlier can get higher proficiency than adults starting later was mentioned, it is permitted that there is some supporting evidence, on the contrary, there is not any opposed empirical research proof. Krashen also made the same conclusion after he had reviewed a number of experimental reports on foreign language learning.

Johnson and Newport's findings (1989) have been accepted as the best evidence supporting the critical period in second language learning. In their study of critical period effects in learning a second language, Johnson and Newport admitted that a critical period for second language learning exists indeed. Johnson and Newport believed that after the age of six, the ability to learn a foreign language began to decline.

Long (1990) drew several conclusions that were relevant to the topic. Firstly, both the initial rate of acquisition and the ultimate level of attainment depended in part on the age at which learning began. Secondly, there were sensitive periods governing both first and second language development, during which both the acquisition of different linguistic domains was successful and after which it was incomplete. Thirdly, the age-related loss of ability was cumulative, not a one time event. Last but not least, deterioration in some individuals began as early as six. Patkowski(1980) suggested that a critical period for second language learning did indeed exist. His study meant to find out the likelihood of a critical period for learning a second language. Patkowski found that learners under the age of 15 achieved higher syntactic proficiency than those who were over the age of 15 at the starting of exposure. The result of the study showed that of those who were exposed to pre-puberty (participants up to the age of 15), all (except one) achieved ratings of four through five, whereas those in the post-puberty group received a wider range of scores, with the mean falling in the three range. His findings were fully consistent with the Critical Period Hypothesis.

Christine Weber-Fox and Helen Neville (1999) examined bilinguals' Event Related Brain Potentials (EPR), which allowed for measurement of electrical activity in various areas of the brain. A series of experiments revealed that late learning bilinguals displayed slower linguistic processing than early-learning bilinguals, and that language-related neural systems of later learner were different in focus and function from those of early learners. Furthermore, the processing of grammatical aspects of language was distinct. Christine Weber-Fox and Helen Neville also reviewed other applications of neural imaging techniques to bilingualism and second language acquisition, underling the specific areas of linguistic competence in which difference between late and early bilinguals were to be found. These differences were viewed as being consistent with the conception of the Critical Period Hypothesis.

The Critical Period Hypothesis has noticeable effects on foreign language learning. Many researches and experiments support this hypothesis. In foreign language learning, the Critical period hypothesis provides the following information: in the terms of language learning, children seem to be superior to adolescents and adults, that is, the children outperformed the adolescents and adults; foreign language learning and teaching should commence before the critical period.

C. Criticism for the Critical Period Hypothesis

With the proposition of the Critical Period Hypothesis, there are lots of opposed views accompanying with its supporting views in the field of linguistics. Ellis (1985) pointed out that the argument that the younger the age of language acquisition is, the easier language acquisition was not completely correct. It is only partly right. In fact, age has the superiority in terms of the acquisition of pronunciation.

With the advent of the medical science, some viewpoints of the Critical Period Hypothesis were also under criticism. Some research work has challenged the precise age when lateralization takes place, leading to doubts about the neurological basis of the critical period hypothesis.

Having reviewed the Chinese scholars' researches on the Critical Period Hypothesis (CPH), it shows that many of them are on the opponent side. In his work of Psycholinguistics, Gui Shichun expressed his views: "It is hard to get a definite answer as to what is the best age of foreign language learning, so we cannot simply draw any conclusion whether there is a critical period, instead we should study the learning features of different stages, then make full use of them in foreign language learning." Shu Dingfang thought learners at any starting age could succeed in foreign language learning. If children started their foreign language learning at 12, their foreign language abilities can also develop to the level of the native-speaking students on the basis of fine language surroundings and scientific teaching methods. Similarly, Dai Weidong commented that the starting age had little effect on the acquisition procedures; learners at any starting age can learn a foreign language well. The noticeable effect from age factor to acquisition was the level in some language skills. Besides, the different amount of time they put in learning the language would affect the success degree of the acquisition. He also suggested the best age for the Chinese students to study a foreign

language should be from 12 to 15. After a review of the arguments of CPH in the past several decades and introduction of some new findings in the field of the Critical Period Hypothesis, Wang Lifei came to a conclusion: "It needs further study whether there is a critical period in second language acquisition and whether there are different critical periods of different language skills." Liu Zhenqian expressed his opinions in one of his theses: "In fact, there is no CPH for second language acquisition, at least there are not sufficient evidences in spite of so many researches with different methods, purposes, theoretical basis and results. Even in phonology, the different achievement between later learners and earlier learners are not the results of age factor alone, but a combination of other relevant factors." Liu Jianfu, through his experiments, tries to investigate whether the learners of different ages experienced the same learning process in grammatical aspect. He presented his study result: "grammar is teachable for various learners at different ages; there is no critical period for grammar acquisition". However, Chen Baoguo thought the Critical Period Hypothesis has got more and more supports, yet further study was still needed, that is, in and after critical period what changes of neurological structure and function has taken place inside the brain. He presented an objective suggestion: "we should take the active function of critical period in language acquisition into consideration, yet we can't exaggerate the effects of critical period in second language acquisition."

III. RESEARCH DESIGN

A. Research Questions

Up till now, the main theoretical basis of early SLA, Critical Period Hypothesis has led to much disagreement between the proponent and opponent side, and different findings of second-language learning/teaching at the elementary school have been reported. Now facing the tendency to start English learning/teaching at lower age, this present study sets out to investigate, by data collection and statistics analysis, the following questions:

(1) Whether English learners starting their learning at kindergarten and elementary school will be more successful than those starting at secondary school in their College Entrance Examination and in their achievements at college stage (College English Test)?

(2) If the answer to question (1) is affirmative or negative, how can age-related differences or similarities be explained?

B. Subjects

For the present study, altogether 69 non-English majors were selected from Inner Mongolia University of Technology. Then the students were classified into three types: kindergarten starters (Type 1), elementary school starters (Type 2), and secondary school starters (Type 3). It should be noted that the students who have not taken part in the CET 4 have been excluded from the current study.

C. Instruments

The Questionnaire used here was a self-report inquiry. On the basis of class, we read the instructions to the subjects and emphasized on answering every question honestly and seriously. The answers was thought to be more believable, since it was impossible for any subject to forget his own age onset of English learning; secondly, it was unnecessary for them to tell lies.

The different scores of different groups of subjects, namely, the scores of College Entrance Examination and scores of CET4 of all the 3 groups of subjects, were all collected from the archives office of the University so that the truth and accuracy of the scores are ensured. Therefore, there is no doubt about its reliability. All the data were processed in software of SPSS 13.0.

IV. RESULTS AND DISCUSSION

A. Results

1. Questionnaire Result

TABLE 1
STUDENTS TYPE, AGE ONSET AND NUMBER

Type	Age onset	Number
Type 1	Kindergarten	7
Type 2	Elementary school	32
Type 3	Secondly school	30
In Total		69

TABLE 2
THE BEST AGE TO STUDY ENGLISH

Best Age	Number	Percentage
Kindergarten	12	17.4%
Elementary school	37	53.6%
Secondary school	20	29%
In Total	69	100%

TABLE 3
“THE EARLY, THE BETTER?”

Answer	Number	Percentage
Agree	44	63.8%
Disagree	25	36.2%
In Total	69	100%

2. College Entrance Examination (CEE)

Table 4-6 show the score of the three types of English learners in their College Entrance Examination (CEE). 1, 2, 3, in all the tables of Descriptive Statistic and Multiple Comparison refer to type of age onset—Type1, Type2 and Type3 respectively.

TABLE 4
DESCRIPTIVE STATISTICS

ST	N	Mean	Std.Deviation
1	7	119.3500	11.0022
2	32	115.8182	8.3451
3	30	107.9933	11.5154
Total	69	113.6967	11.7221

TABLE 5
ANOVA

	Sum of Square	df.	Mean Square	F	Sig.
Between Groups	1951.708	2	975.854	9.037	.000
Within Groups	6155.371	66	107.989		
Total	8107.079	68			

TABLE 6
MULTIPLE COMPARISON

(I)ENTRY	(J)ENTRY	Mean Difference(I-J)	Std. Error	Sig.
1	2	-0.3409	21.452	0.987
	3	56.7833	20.675	0.008
2	1	0.3409	21.452	0.987
	3	57.1242	14.584	0.000
3	1	-56.7833	20.675	0.008
	2	-57.1242	14.584	0.000

Table 4 illustrated the mean score of the three types of subjects were different in their College Entrance Examination. The score of Type 1 and Type 2 were much better than Type 3. The standard deviation were also different, Type 3 were higher than Type 1 and Type 2 which implied that among the subjects in Type 3, their scores in CEE differed more greatly than that of Type 1 and Type 2. And the lowest value of Type 2 suggested a less degree of dispersion; the scores of the subjects in Type 2 were closer. From table 5, we can see the degree of freedom and significance difference were meaningful with $F=9.037$ and $p=.00$, lower than .05, which meant the difference of the three types of learners was statistically significant. And the further study of Multiple Comparison suggested that the differences between Type 1 and Type 3, Type 2 and Type 3 reached a significant level.

3. College English Test (Band 4)

Table 7-9 are to show the score of the three types of subjects in CET (Band 4).

TABLE 7
DESCRIPTIVE STATISTICS

	N	Mean	Std.Deviation
1	7	496.1125	34.08994
2	32	499.5816	52.96387
3	30	477.7736	39.41778
Total	69	473.215	50.59176

TABLE 8
ANOVA

	Sum of Square	df.	Mean Square	F	Sig.
Between Groups	38907.2950	2	19453.6727	9.891	.000
Within Groups	112103.4215	66	1966.7462		
Total	151010.7165	68			

TABLE 9
MULTIPLE COMPARISON

(I)ENTRY	(J)ENTRY	Mean Difference	Std. Error	Sig.
1	2	-0.4886	2.579	0.850
	3	6.9083	2.485	0.008
2	1	0.4886	2.579	0.850
	3	7.2970	1.753	0.000
3	1	-6.8030	2.485	0.008
	2	-7.2970	1.753	0.000

Table 7 illustrated the mean score of the three types of learners in their CET (Band 4) were also different; the result of Type 1 and Type 2 were much better than Type 3. The standard of deviation were also different, Type 2 was higher than Type 1 and Type 3, which implied that among the subjects in Type 2, their scores in CET (Band 4) differed greater than subjects in Type 1 and Type 3. And the least value of Type 1 suggested a less degree of dispersion. The scores of the subjects in Type 1 were closer. From table 8 we can see the degrees of freedom and significant difference were meaningful with $F=9.891$ and $p=.000$, lower than .05, which meant the difference of the three types of learners was statistically significant. And the further study of Multiple Comparison suggested that the differences between Type 1 and Type 3, Type 2 and Type 3 reached a significant level.

To sum up, from the above-mentioned data analysis, we can see there were significant differences between Type 1 and Type 2 and Type 3 of non-English majors in their College Entrance Examination, in CET (Band-4).

B. Discussion

The results revealed that the relationship between age onset of second language learning and the achievements of the College Entrance Examination as well as the English achievements in College English Test were statistically significant. That is to say, compared with the secondary school starters (Type 3), the kindergarten starters (Type 1) and elementary school starters (Type 2) are in an advantageous position to get higher scores in their future English study. Such a result appears to support the “the earlier, the better” assumption. As a consequence, a suggestion is to put forward for the learning of English before secondary school due to the above experiment results as well as the similar conclusion from some scholars.

The question of what actually accounts for the attested discrepancies between child and adolescent of second language learners will be discussed in the following part. A number of factors discussing here may help to understand why the different ages at which the acquisition of English began result in varying degrees of success in English learning. Neurological, social-psychological, psychomotor and cognitive factors all may be part of the explanation.

1. Neurological Difference

One widely cited attempt to explain why children are better second language learners is the neurological consideration. It is believed that the brain of the human beings consists of a left hemisphere and a right hemisphere, and as children grow older, different functions are said to develop gradually in different parts of brain. It has been shown that as the human brain matures, the language function settles mainly in the left hemisphere after biological maturation or the critical period. The critical period for language learning has been considered to be consistent with the period lateralization completes; therefore, many researchers take the completion of lateralization to explain the different achievement of children and adolescents in SLA. The results in the present study that earlier starters of English show their superiority in their relative achievements may find the explanation from the neurological considerations.

2. Social-psychological Difference

Another possible influence on adolescent language learning is the social-psychological factor. In Second Language Acquisition, the different psychology between children and adolescents may be employed to explain the reason why child-learners possess superior communicative ability, such as oral expression and listening comprehension. Usually the child-learners enjoy taking part in every kind of language activity, and enjoy the language interaction. They can speak loudly, they can ask questions anytime, and they are not worried about making mistakes. They may be more prepared to share external norms because they are not subject to peer pressure. All these resulted in their enough exposures to L2 and more practice in their speaking and listening skills. On the other hand, when an adolescent learns a second language, his situation is quite different from that of a child. When they learn a foreign language, adolescent-learners have difficulties in participating in language interaction and many of them are reluctant to read aloud and are fearful of failing or looking and sounding foolish. Sometimes, they try to avoid answering questions or communicating with others. These might explain why adolescents in my study, like those in Collier’s research, are less successful in English learning.

3. Input Difference

Input difference is related to resource difference, that is, subjects in the present study within the age range of 3-5 may have more authentic input than subjects who just received national-scale English courses starting from the secondary schools. It is often believed that the simplified input which young children receive facilitates their second language acquisition compared with the input received by older learners.

Fledge suggested in his paper “Age of learning and Second Language Speech” another explanation that might account for the effect of age on L2 learning. Older learners may have received less adequate input than children do.

Younger children may generally receive more native-speaker L2 input or fewer nonnatives L2 input than older learners do.

Features of input have been suggested as potential explanations by Hatch (1976) and Snow (1983). Younger learners are said to receive better (i.e. more 'here and now', less complex) input than adults, input which provides the children with clearer L2 samples from which to learn syntax (Hatch, 1976, pp. 39-57). Children also enjoy opportunities for language play with their native-speaking peers, through which they get phonological practice (Peck, 1978).

V. CONCLUSION

The present study was undertaken primarily to explore the relationship between the age onset of second language learning and its relative achievements. It is a widely held that younger L2 learners generally do better than older learners. This is supported by the Critical Period Hypothesis, but the argument about CPH in SLA has never stopped. The controversy is not only on whether age is a determining factor leading to significant differences in L2 learning, but also on the theoretical explanations for those differences, which the researchers claim to have found. Maybe the only generally accepted results are: "the earlier, the better; but the older, the faster" and there is a CPH in a phonology acquisition. Frankly speaking, it is beyond the author to bring any conclusive result based on this study; however, it will be more practical to explore the relationship between different age onset of English learning and its relative achievements (for example, College Entrance Examination, College English Test), since the results of such research can provide the educators and parents with some helpful insight into the timing and contents of the earlier English learning for children.

The results of the present study reach the conclusion that there are significant differences between the types with different age onset of second language acquisition and its relative achievements, particularly in the aspects of listening and speaking. This conclusion is consistent with Penfield's report, who was the first to link "the earlier, the better" view with foreign language learning. Therefore, it is necessary to start English learning at the kindergarten or elementary school stage and the learning/ teaching should be emphasized on listening and speaking. In this way, the early learning of English will lay a good foundation for the learners' future study and achievements. However language learning is a complicated process, while accepting the role of age in SLA, we should, at the same time, realize that it is likely that more individual factors exist in the relationship with achievements.

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Meihua Wang was born in Hinggan League, Inner-Mongolia Autonomous Region, China in 1977. She received her M.A. degree in education from Inner Mongolia Normal University, China in 2008.

She is currently a lecturer in the School of Foreign Languages, Inner Mongolia University for the Nationalities, Tongliao, Inner-Mongolia Autonomous Region, China. Her research interests include Applied Linguistics and English—Mongolian Comparative Teaching.

Ms. Wang is awarded Outstanding young teachers in innovation by Inner Mongolia University for the Nationalities.