

Age Factor in Foreign Language Acquisition

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The paper focuses on some theoretical issues concerning age factor in second language acquisition. It critically reviews several ideas on age factor, the main attention being paid to the two issues of "nature-nurture" and "critical/sensitive period." It concludes with practical suggestions for the improvement of the current TEFL situations in Korean school systems.

I. Introduction

The issue of age is one of the perennial topics in the study of first and second language acquisition. It has played an important role in making educational decisions concerning when second language instruction should be introduced in the formal school settings.

Although no definite answers have been proposed, many studies regard the following questions as the two main research topics regarding age factor:

- (1) Are younger learners better than older learners in second language acquisition?
- (2) Do sensitive period(s) exist in second language acquisition?

The first question has been dealt with mainly through the debate of the Nature-Nurture argument, in early studies completed in the 1950's through the 1980's. The second question has been discussed from the perspective of the extreme Nature, in the early hypothesis of "critical period" (Penfield and Roberts 1959, Lenneberg 1967) to recent arguments of "sensitive period(s)" hypothesis (Long 1990, Johnson 1992). As a matter of fact, the two questions can not be separated because the critical (sensitive) period hypothesis is based on the belief that younger learners are much more successful in language learning, whereas older learners can never reach native-like proficiency.

In this paper, several studies of the two above mentioned questions will be discussed. This discussion will lead us to pedagogical suggestions for the improvement of the current TEFL (Teaching English as a Foreign Language) settings in Korea.

II. Question 1: Are younger learners better than older learners in second language acquisition?

It is a long held common belief that children acquire new languages more easily and

naturally than adults. However, the findings of empirical studies have been so diverse that we can not reach a consistent conclusion about the perceived advantage of children in language learning.

Krashen, Long, and Scarcella (1979) and Singleton (1995) suggest the "consensus view": older learners are more efficient in the initial stages of L2 learning, but younger learners outperform them in the long run in naturalistic environments. Their conclusions imply that the studies regarding age differences need to be categorized by context (in a naturalistic setting and in a classroom setting) as well as by focus of acquisition (rate of acquisition and ultimate attainment).

1. Studies of Acquisition in a Natural L2 Context

1) Rate of Acquisition

The consensus view mentioned above seems to be supported by the results in empirical studies as summarized in the following chart.

	subjects	age	test	results
Ervin-Tripp(1974)	31 English-speaking French learners in Switzerland	4-9	aural comprehension of French syntax and morphology	Older children preformed much better than younger children.
Fathman(1975)	200 immigrant English learners in the U.S.	6-15	oral production of phonology, morphology and syntax	Older children(11-15 age group) scored higher on the morphology and syntax, whereas the younger children(6-10 age group) received higher ratings in phonology.
Snow and Hoefnagel-Hohle(1978 a,b)	100 English-speaking Dutch learners in Holland	3-adult	oral morphology and syntax	Older learners(12-15 age group) performed much better than younger children(6-7 age group).

The above studies reveal that older learners are more efficient than younger learners in the areas of syntax and morphology at initial stages. Meanwhile younger learners showed better performance in phonology. Although "initial stage" is defined differently in Snow and Hoefnagel-Hohle's study (six months) than in the Fathman's study (three years), these studies are remarkable in showing that younger learners are not necessarily more successful in language learning at least in the initial stages, even in a natural L2 context.

2) Ultimate Attainment

Although the number of studies regarding ultimate attainment is relatively small, the results mostly confirm that younger learners are much more successful in attaining native-like proficiency, especially in oral/aural abilities:

	subjects	age	test	result
Asher and Garcia(1969)	71 Cuban immigrants who lived in the U.S. for five to eight years	7-19	pronunciation	The group who arrived in the U.S. between age one and age six was rated to have most native-like accent.
Oyama(1976,1978)	60 Italian immigrants who lived in the U.S. for at least five years		pronunciation(1976) and listening comprehension(1978)	The younger arrival group, who came to the U.S. before the ages of 11 and 12 received much higher scores than the late arrival group.
Patkowski(1980)	61 immigrants who lived in the U.S. for at least five years		syntax	The group of people who arrived in the U.S. before the age of 15 were the most native-like in the use of English syntax.

Common results found in the above studies are as follows:

First, the findings reveal that age of arrival in the L2 country is a strong predictor of ultimate success in L2 aural/oral proficiency in natural settings.

Secondly, the length of stay and the amount of informal exposure or formal

instruction were found to have little effect on ultimate proficiency.

Lastly, the relationship between the length of exposure to the L2 and proficiency appears to be minimal beyond a five-year term of exposure in the L2 environment.

These results seem to be in accord with the argument of the critical period hypothesis which emphasizes the timing of initial exposure for efficient language development. However, the studies deal mainly with the area of phonology which may not be the most important ability (Singleton 1995) for second language acquisition.

2. Studies of Acquisition in a Classroom Context

1) Rate of Acquisition

Most studies regarding this question reveal that older learners are more efficient than younger learners in the initial rate of acquisition. The research conducted in immersion settings will be included in this category as well as studies in formal classroom settings.

	subjects	age	test	result
Burstall et al.(1974)	British learners of French in formal classroom	One group who began learning at age 8 and the other group who began at age 11 were tested after three years of instruction	listening speaking reading writing	The older learners performed better in listening, reading, writing whereas the younger group performed better in speaking test.
Ekstrand(1978)	Swedish learners of English in formal classroom	Four groups aged 8,9,10 and 11 were tested after 18 weeks of instruction.	pronunciation and aural comprehension	The performance of the children increased almost linearly with age.
Swain(1981)	English-speaking learners of French in immersion program	grade 10: late immersion group grade 8: early immersion group	reading and listening comprehension	G10 group performed better in reading comprehension while G8 group performed better in listening comprehension.
Harley(1986)	24 English-speaking learners of French in immersion program	6-7 years old group in early immersion program and 9-10 years old group in late immersion program were tested after 1000 hours of in-class exposure to French	Syntax and vocabulary by context embedded test(guided oral interview)	The group in late immersion program acquired greater oral control of the French verb system and vocabulary.

First, older learners in general showed greater efficiency in the areas of reading, writing, syntax, and vocabulary. However, contradictory findings were reported in listening and speaking. Younger learners outperformed older learners in two studies (Burstall et. al 1974, Swain 1981), meanwhile older learners showed better performance in one study (Ekstrand 1978).

Secondly, we find one intriguing point in the research method employed in Harley (1986). She points out that previous research mainly dealt with context-reduced academic type tests. These cognitively demanding tests might contribute to the results of older learner efficiency. Therefore, she devised a more communicative-based test, that is,

guided oral interviews which might not require mature cognitive ability and test-wiseness. Nonetheless, the result was that older learners who began learning L2 later performed better than younger learners who began earlier. This was the case even in immersion programs.

2) Ultimate Attainment

In contrast to the younger learners' advantage in naturalistic L2 context for aural/oral skills, different results were found in studies conducted in a classroom context except for one conducted in an immersion setting.

	subjects	age	test	result
Burstall et al.(1974)	British learners of French in formal classrooms	One group who began learning at age 8 and the other group who began at age 11 were tested when both groups reached age 16.	listening speaking reading writing	The late learners performed better in all areas of testing except in listening. Early learners showed a slightly better performance in listening comprehension.
Oller and Nagato(1974)	Japanese learners of English in formal classrooms	One group who began English in grade 1-6 and the other group who began learning English in grade 7 were compared when they were in grade 11.	cloze test	Early learners did not perform better than late learners.
Harley(1986)	24 English-speaking learners of French in immersion program	One group who began learning English through early partial immersion(K-1) and the other group who began learning English through late immersion(G4-5) were tested when they reached grade 9-10.	syntax and vocabulary through guided interview	The early immersion group performed better in syntax and vocabulary control.

We can draw two distinct main points based on the results of these studies: First, an early start advantage for ultimate attainment was not found in formal classroom settings. As a matter of fact, older learners appeared to catch up with younger learners who had started L2 learning earlier.

Singleton (1995) points out that the early beginning of L2 instruction does not result in high proficiency in formal classroom environments, because the amount and density of input are extremely insufficient compared with those in naturalistic contexts. According to his estimation, more than 18 years of formal instruction will be needed to obtain the same amount of input as naturalistic L2 learners receive, who reach the ultimate proficiency level. Therefore, it seems clear that an early start of L2 instruction can never guarantee more success in a formal classroom setting.

Secondly, only in immersion programs, there appear to be a possibility that an early start could be helpful as shown in the findings of Harley (1986). However, as Harley (1986) points out, the more successful performance of early starters can be explained by other factors: amount of input and time of instruction.

Summary

In a naturalistic setting, the consensus view that older learners are more efficient in the initial stages and younger learners outperform in the long run was confirmed. Younger learners especially were more successful in attaining native-like proficiency in oral/aural skills.

In a formal classroom setting, however, older learners were consistently more efficient in the initial rate of acquisition and in ultimate attainment. These results may be attributed to the fact that the amount and density of input are not sufficient to balance the "older learner advantage" pointed out by Singleton (1995). It may be concluded that the early start of L2 instruction can never guarantee more success in a formal classroom setting. Therefore, the consensus view seems not to be applicable to the formal instructional context.

III. Question 2: Do sensitive period(s) exist in second language acquisition?

1. The Notion of Critical/Sensitive Period

A "critical period" means the period during which organs or systems develop normally if they are exposed to appropriate input. The concept implies that organs or systems cannot develop successfully even with exposure to prolonged input outside a critical period.

This hypothesis originated from the study of animal behaviors such as studies of imprinting in ducks (Hess 1973) and was extended to language acquisition by the studies of Penfield and Roberts (1959) and Lenneberg (1967) who introduced the concept to language acquisition theory for the first time.

The research of Penfield and Roberts (1959) and Lenneberg (1967) is based on the clinical observations of language recovery patterns in brain damaged patients. According to their arguments, brain plasticity and lateralization contribute to children's advantage in language learning. Although their primary concern was first language acquisition, they suggest that there exists a biologically determined critical period for second language acquisition (age two to puberty). However, as many critics point out, constraints on the transfer of language functions in damaged brains can not be directly applied to the L2 acquisition ability of the normal brain. Regardless of this criticism, Penfield and Roberts's (1959) and Lenneberg's (1967) arguments have been supported by a number of subsequent studies in L1 and L2 acquisition.

In this paper, some early studies (before 1980) of critical/sensitive period in L2 acquisition will be reviewed briefly because they overlap with the studies mentioned in the previous section. Thereafter, recent arguments will be reviewed in more detail.

2. Early Studies of the Critical/Sensitive Period Hypothesis

Most early studies are concentrated in the area of phonology. The studies which reveal an advantage for children in ultimate attainment can be included in the early studies which argue for the critical period hypothesis (Asher and Garcia 1969, Oyama 1976, 1978, Patkowski 1980). Their findings suggest that there is a negative correlation between L2 proficiency and age of first exposure (age of arrival) to the L2 environment.

Seliger (1978), further suggests that there exist different sensitive periods for L2 acquisition for the different components of language based on studies of different aphasia types. However, results from other early studies are rather contradictory, therefore, there is no conclusive evidence for supporting the critical period hypothesis. This is because we can not conclude consistently that younger learners are much more efficient in acquiring L2 in all situations as shown in the results of the previous section.

3. Recent Studies of the Critical/Sensitive Period Hypothesis

A series of studies by Johnson et al. (Johnson and Newport 1989, 1991, Johnson 1992, Slavoff and Johnson 1995) aroused interest in the critical period hypothesis again recently, especially in the area of syntax.

In Johnson and Newport (1989), English grammatical proficiency of 46 native speakers of Korean and Chinese was investigated. The subjects arrived in the U.S. between the ages of three and thirty-nine and were tested by an auditory grammaticality-judgment task. The results revealed that success in acquiring grammatical proficiency is almost entirely predicted by the age of first exposure to English. The age of first decline in grammatical ability turned out to be age eight, and there is a strong negative correlation between the age of first exposure and grammatical proficiency. However, no correlation appeared after age 15 and the later-exposure group showed a large group variance.

In a later study, Johnson(1992) tested the same subjects with the same grammaticality-judgement task, this time in written test form to ascertain the effect of the task mode. The same results were obtained, that is, younger-exposure groups outperformed later-arrivals. However, the negative correlation between the age of arrival and grammar proficiency was less significant than that of the study in 1989. She concludes that the written task is less discriminating in showing performance difference than the auditory task.

Slavoff and Johnson (1995) examined 107 children with different L1 backgrounds (Korean, Chinese, Japanese, and Vietnamese). They arrived in the U.S. between the ages of seven and twelve years and were tested on English grammar and morphology proficiency at different times during the length of their stay in the U.S. (the periods ranging from six months to three years). The test was a reduced version of the grammaticality-judgment task used in Johnson and Newport (1989). The result of this research contrasts with other previous studies in that there was no significant correlation between the age of first exposure and the subjects' grammar proficiency. Their performance was correlated with the length of stay in the U.S. and with gender which means females outperform males. Slavoff and Johnson conclude that the critical period effect seems to occur after learners begin to acquire the more difficult structures of the language.

These studies discussed thus far are regarded as important studies in supporting the critical period hypothesis. However, they seemed not to reveal definite critical period effects on second language acquisition. The reason is that the younger-arrivals did not consistently outperform the older-arrivals in different modes of testing and in different times of testing. Therefore, we cannot definitely conclude that success of L2 acquisition is predicted by the age of first exposure to the L2 environment.

The studies of Kim (1991) and Shim (1995) are intriguing in that they investigated

Korean learners of English in the U.S. Kim (1991) tested 60 Korean subjects who had arrived in the U.S. at ages ranging from zero to 29 years and had lived a minimum of five years in the U.S. The test used was a grammaticality judgment task of 96 English sentences in 12 grammatical categories employing a reaction-time procedure. The results reveal that no significant correlation appears between the age of first arrival and grammatical accuracy. Meanwhile, subjects showed differences in reaction time which the researcher regards as the difference of "automaticity." Kim concludes that accuracy seems to be related more to length of stay rather than to age of first exposure, whereas the difference of automaticity shows the effect of a critical period.

Shim (1995) investigated 120 Korean-English bilinguals who had arrived in the U.S. between the age of zero to 14 years and had lived 9 to 19 years in the U.S. at the time of testing. The test was a grammaticality judgment task of 180 English sentences employing accuracy and reaction time analysis. The results were almost the same as those of Kim (1991), that is, subjects only showed a significant difference in reaction time. As for accuracy of grammar, a significant negative correlation did not appear between the age of arrival and the mean score on the grammaticality judgment task. The subjects seemed to perform very well in almost all grammatical and ungrammatical structures. Nonetheless, Shim argues strongly for the critical period based on the difference in speed of sentence-processing.

Regardless of the substantive findings of these studies, the studies of Kim (1991) and Shim (1995) seem to be too weak to show strong evidence of a critical period. This is because the differences in reaction time are actually much less than one-tenth of a second. The minute time difference may be caused by other factors, such as individual differences of reflex movement ability. As a matter of fact, the subjects may have acquired ultimate proficiency at least in grammar after a certain period regardless of age of first exposure to the L2 environment, since they showed no significant difference in accuracy of grammaticality judgment.

Contrary to the claim of the studies discussed above, many recent studies argue strongly against the critical period, particularly in the areas of phonology and syntax.

Bongaerts, Planken and Schils (1995) investigated two groups of Dutch speakers who started learning English in secondary education, at about age 12. At the time of testing, they had all received 7 to 12 years of English instruction at Dutch secondary schools and universities. None of them had ever had contact with native speakers of English or had visited an English-speaking country before the age of 15. The speech samples elicited by free talking about a topic, and reading of words and sentences were judged by a group of English native speakers. The result reveals that some learners were judged to have attained a native-like accents. The researchers conclude that these results can be a challenge to the claim that there is a biologically constrained critical period for acquiring L2 phonology.

Lengyel (1995), after testing Hungarian children (age 6-8) by speech perception and

speech production tests for foreign words, concludes as follows: (a) Phonological ability is not a unidimensional component for children. Therefore, it is too simplistic a view to claim that all children have more abilities than adults in phonology. (b) The effect of age emerged, but was not so significant that it would be attributed to individual differences such as differences of learning strategies.

As for syntax, Martohardjono and Flynn (1995) strongly argue against the critical period in the area of grammatical ability. They argue that the best way to test the existence of critical period is to test whether adult L2 learners have grammatical knowledge like that of native speakers. They present the study of Martohardjono (1993) which tested the English grammatical abilities of Chinese and Indonesian native speakers. The result of Martohardjono (1993) showed that adult Chinese and Indonesian learners had full knowledge of English grammar like that of native speakers. They conclude that the biologically determined ability for language, that is termed Universal Grammar, remains available in acquiring L2 regardless of age.

The study of Ioup et. al.(1994) also shows two cases of successful adult second language acquisition. The researchers investigated two female Egyptian-Arabic learners who were both educated native speakers of English. One subject learned Egyptian-Arabic through mere exposure, the other learned it through instruction and exposure. They were both judged by native speakers of Egyptian-Arabic in a speech production task, an accent identification task and a translation task. The performance of both subjects were judged to be comparable to that of native speakers in all tasks. Based on this result, the researchers conclude that some L2 learners can attain native-like proficiency regardless of learning environment and age of first exposure.

Summary

It may be concluded that support for the critical period hypothesis is, at best, very inconclusive. This is because the studies which argue for the critical period fail to reveal definite evidence of biologically determined age effects. In addition, some research shows that late beginners of L2 can attain native-like levels of proficiency in phonology and syntax.

IV. Pedagogical Implications Applicable to Korean EFL Context

1. Korean EFL Classrooms

Until the year 1996, Korean EFL (English as a Foreign Language) learners mostly began learning English upon entering secondary education. They learned English 4-5 hours a week through formal classroom instruction for six years in secondary schools. Some learners who enter the university continue to learn English during the first year in

a regular curriculum. English teachers in secondary schools are almost always native speakers of Korean. Classes are largely dependent on written textbooks and learners do not have a lot of chances to interact with teachers because of large class sizes. The instruction, in general, consists of teachers' explanations about grammar, reading, and translations. In addition, most learners seldom have the opportunity to use English outside the classroom, because they never go to English speaking countries, nor do they talk with native speakers of English.

Given this situation, the Korean Ministry of Education decided to include English in the elementary school curriculum since the year 1997. According to this decision, all Korean elementary school children will begin learning English from the 4th grade, twice a week through formal instruction. Elementary school teachers who finish the short-period training programs for FLES (Foreign Language in Elementary School) are assigned to teach the students. Most classroom activities consist of listening and repeating simple words and sentences based on textbooks. The situation of instruction is almost the same as that of secondary schools because of the large class sizes.

In short, English education in elementary school started without enough preparation in materials and teacher training. The decision seems to have been made because of pressure from a group of enthusiastic parents rather than because of educational considerations. Therefore, we need to reconsider the effect of English education in elementary school in terms of the previously discussed research.

2. Pedagogical Implications of the Previous Research

The following suggestions can be made regarding pedagogical implications applicable to the Korean TEFL environment based on the research reviewed here.

First, the early start of English education can never guarantee more success in the Korean TEFL situations. As mentioned before, the amount and density of input are too limited to provide any advantage of beginning early in formal classroom settings like the ones in Korea. On the contrary, insufficient preparation may cause a loss of motivation and interest in learning foreign languages for the children.

Secondly, late beginners (secondary school students) who have more cognitive abilities than children can be more efficient in learning English in a Korean TEFL context. Therefore, improvement of the educational environment such as reducing the sizes of classes is needed more than the practice of English education in elementary school.

Third, the critical period hypothesis is too inconclusive to provide any implications for practical issues of foreign language teaching. Although it proves that the critical period exists at least in the area of phonology, the hypothesis does not have significant implications because the problem of phonology is not the most important matter in foreign language education.

Last, but not least, more research on the age factor in a formal classroom context is

needed because most previous research mainly deal with acquisition in naturalistic L2 contexts.

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