

論 説

# A Theoretical Exploration of Ultimate L2 Attainment in Adult and Child Learners

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## 概 要

この論文は第二言語習得の最高到達度についての賛否両論の諸説を臨界期説, 社会的要因, そして普遍文法の立場から概観したものである。第二言語習得の最高到達度に関しては子供が大人よりまさっていること, また大人学習者はフォーマルな学習指導が必要なことを諸説は支持している。

## Introduction

According to personal experiences, academic observations, and scholarly studies of L2 learning, adult language learners seem to have more difficulty than younger ones in second language acquisition. Young L2 learners, especially in the period before puberty, seem to learn a second language with little effort merely through interaction with target language speakers and even attain native-like proficiency in L2. On the other hand, while adult L2 learners, past the age of puberty, seem to be still able to learn a second language, they need conscious effort and tend

to have negative transfer from their first language. As a result, adult L2 learners rarely attain native-like proficiency.

In order to explain this struggle of adult L2 learners, numerous researchers have suggested that a critical period exists for L2 acquisition. These proponents of the critical period assert that this period comprises a limited duration of time available for successful language learning before puberty. According to these researchers, L2 learners cannot attain native-like level proficiency because they have passed this critical period. In support of this critical period hypothesis, empirical studies have reported that the adult L2 learners' ability to attain native-like proficiency declines steadily and progressively with increasing age. Other researchers, however, have claimed that the critical period does not affect all aspects of adult L2 learning, citing case studies of successful adult L2 learners and empirical studies based on Universal Grammar. Therefore, linguists have not reached complete agreement on the nature of a critical period for language learning.

To explore critical period studies is indispensable for an understanding of ultimate L2 attainment in adult and child learners. Therefore, the following review of research will explore the pros and cons of the critical period hypothesis for language learning. This exploration will review how well adult L2 learners can attain a native-like proficiency especially from the cognitive and Universal Grammar points of view. The following review of research will also explore social factors which may affect ultimate L2 attainment in adult and child learners. Finally, in the conclusion section, I will offer my support to the claim that adult L2 learners can never attain a native-like level of L2 proficiency because they have passed the critical period for language learning.

## Review of research

### 1 . The Critical Period Hypothesis

The critical period hypothesis is a theory that posits a limited duration of time during which a language can be easily acquired to reach a native-like level of proficiency. The first to hypothesize this concept are Penfield and Roberts (1959). They claim that language learning increases in difficulty with age because the brain begins to decrease cerebral plasticity especially after puberty.

Then Lenneberg (1967) describes this critical period hypothesis in more detail. He maintains that, because of biological development, this period lasts until puberty, around the age of twelve or thirteen years old. He also explains that language learning can be more difficult after puberty because after this period, the functions of language in the brain have already been fixed in the left hemisphere of the brain; this is called lateralization. According to Lenneberg, evidence for this lateralization stems from the observation that children who undergo surgery on the left hemisphere of the brain do not have a speech impediment because they can transfer the language function from the left to right hemisphere while adults who undergo the same surgery have a speech impediment because they cannot transfer the language function as children do.

Whereas Penfield and Roberts, and Lenneberg present insightful evidence from neurolinguistic points of view, Curtiss (1977) gives a rare actual demonstration of the critical period through a case study. According to Curtiss, by the act of cruelty of her father, a young girl was confined in the basement of the house after birth for thirteen years without exposure to a language. After she was emancipated from this

horrible confinement, she was given seven years of training to recover her language. Even after seven years, she was able to acquire only a few aspects of syntax and semantics. After all this post-pubertal girl was not able to attain a native-like level of L1 proficiency.

Therefore, this case supports the critical period hypothesis for L1 acquisition. It presents an important and rare case of one subject who started learning her first language after puberty and failed to acquire a native-like level of L1 proficiency because she had passed the critical period for language learning.

In support of Curtiss' study, Grimshaw et al. (1998) present a case study of linguistic isolation. They introduce a young man who has been profoundly deaf since birth and grew up in rural area where he received no formal education and had no contact with the deaf community. According to this study, at the age of 15, this young man was fitted with hearing aids that corrected his hearing loss and he began to learn oral Spanish.

His language development was described over the four-year period since his acquisition of hearing aids. Through the observation of his language development, Grimshaw et al. found that this post-pubertal young man still has severe deficits in verbal comprehension and production. Therefore, they support the critical period hypothesis for first language acquisition that ends at puberty.

Furthermore, Newport (1990) investigated the American Sign Language (ASL) competence of deaf adults. She examined their elicited production and comprehension of the complex morphology of ASL verbs of motion and of ASL basic word order. According to the results of the test scores from the ASL Test Battery, the scores on ASL basic word order did

not show effects of age of acquisition. On the other hand, the scores on ASL morphology showed significant effect of age of learning, with ASL natives outscoring early-ASL learners who, in turn, outscored late-ASL learners.

In addition, Newport reported that these results of the difference of achievement between word order and other grammatical items are in accord with results from the study of Curtiss. Therefore, Newport's findings provide evidence of maturational constraints in first language learning: The later the language is learned, the less its use is native. This supports the critical period hypothesis.

Whereas Lenneberg and Curtiss claim that puberty is the time for lateralization to be completed, Krashen (1973) concludes that lateralization is established much earlier, around the age of five years old. Similarly, Whitaker et al. (1981) suggest that if lateralization can be linked to brain maturation, as postulated by Lenneberg, then puberty is not the appropriate time for lateralization because the language area of the brain acquires its adult characteristics by the age of five years old.

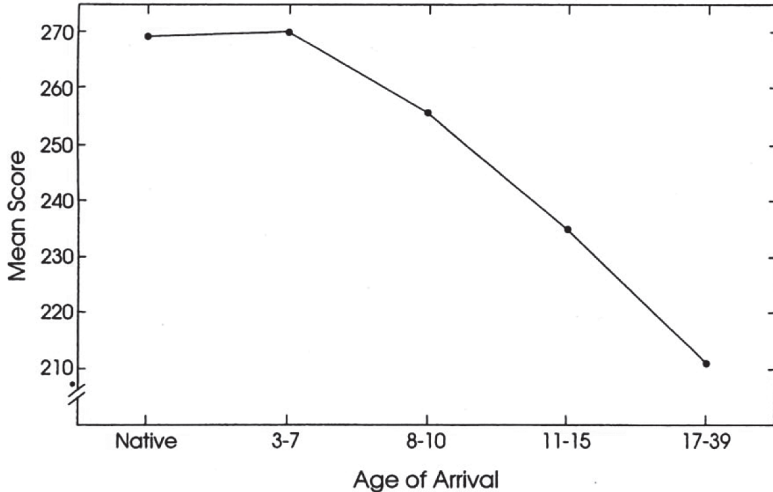
Generally speaking, through these neurolinguistic studies and case studies, while the ability to acquire a first language seems to decline gradually with increasing age, learning a first language seems to be still possible after puberty even though attainment of a native-like level of proficiency may be difficult.

While neurolinguistic studies and case studies support the critical period hypothesis for L1 acquisition, experimental studies support the critical period hypothesis for L2 acquisition.

For example, Johnson and Newport (1989) conclude that the critical period hypothesis extends to L2 acquisition. They administered a

grammaticality judgment test to a population of forty-six L1 Chinese and L1 Korean speakers who had acquired English as L2. Their L2 subjects had all had a minimum of five years' exposure to English. They found a clear and strong relationship between the age of learning L2 and the performance on the grammaticality judgment test, and statistically proved that the ability to achieve native-like grammatical intuitions declines steadily and progressively with increasing age. The result of the relationship between the age of exposure to an English speaking environment and the mean score on the grammar test is shown in Figure 2.1.

As can be seen from this graph, those who had arrived in the United States between the age of three and seven years performed like native speakers. On the other hand, those who had arrived in the United



**Figure 2.1** The relationship between age of arrival in the United States and total score correct on the test of English grammar

*Source:* Johnson & Newport, 1989

States as adolescents or adults showed marked differences from native speakers in their intuitions about English.

From the result of this study, Johnson and Newport claim that the critical period hypothesis is not just for first language acquisition but also extends to a second language. In addition, this study clearly shows that the age of learning L2 seems to be a more important factor than the length of time spent in the target language environment in order to attain a native-like level of proficiency.

In order to further support this finding, Shiraraha (1995) found that child L2 learners acquired a native-like level of the English article system after two years of exposure to English. In contrast, adult L2 learners did not fully acquire the English article system after five years of exposure to English. He conducted a longitudinal case study which had lasted for five years and four months in order to investigate the acquisition mechanism of the English article system by the Japanese L2 learners of English.

The subjects of this study were three adult learners studying in the United States to earn a Ph.D. and two child learners living in Canada. The data collected from those subjects were oral samples and tape-recorded. Through the analysis of these data, Shirahata found that the child learners acquired the English article system almost perfectly after two years of exposure to English. On the other hand, the adult learners did not fully acquire a native level of the English article system even after five years of exposure to English. The major error types made by those subjects were overextension and underextension errors.

Although these adult learners had received a significant amount of instruction in English before they started studying in the United States,

their accuracy rates were lower than those of the child learners who had never been given instruction in English before. From these results, Shirahata concludes that a part of adult ability to acquire L2 tends to decline gradually. Thus, Shirahata's findings also support the critical period hypothesis for a second language.

According to neurolinguistic, case, and experimental studies, the critical period seems to exist for both the first and second language acquisition. However, the exact time frame for the critical period for language acquisition is not known because the time frame for the critical period varies according to the opinions of numerous researchers.

As for a second language, for example, Patkowski (1980) claims that the exposure to a second language should occur before the age of fifteen to acquire a native-like level of competence in syntax.

Long (1990), however, maintains that, from the available data collected, the exposure to a second language needs to occur before the age of six in order to acquire a native-like level of competence in phonology and also needs to occur before the age of fifteen in order to gain a native-like level of competence in morphology and syntax.

Then, Towell and Hawkins (1994) argue that, past the age of around seven to ten, the acquisition of a second language can turn out to be slow and laborious and tends to stop short of native-like proficiency.

Johnson and Newport (1989) also insist that L2 learners can achieve native-like competence in morphology and syntax before the age of seven, and after this age, the ability to acquire a second language declines gradually and steadily.

Moreover, Bialystok and Hakuta (1994) assert that L2 learners can attain native-like competence in morphology and syntax before the



age of twenty. Therefore, further studies should be conducted from University Grammar-based, neurolinguistic, and psycholinguistic points of view, in order to ascertain the exact time frame for the critical period.

Generally speaking, through L2 experimental studies, adult L2 learners seem to have difficulty in attaining native-like grammatical intuitions and retaining foreign accents even though they stay in the L2 environment for a long time. Therefore, the age of learning L2 seems to be more important than the length of time spent in the L2 environment in order to acquire a native-like level of proficiency.

## 2. Social Factors

Some researchers have claimed that success and failure in second language acquisition are largely the results of social, psychological, or affective factors and, that the age of learners is irrelevant or indirectly relevant. For example, Schumann (1975) claims that adult L2 learners are not usually provided with enough of an opportunity to develop their second language skills through genuine communication with speakers of the target L2 language because of the way society functions.

Schumann also states that adult L2 learners have difficulty getting involved in communication that will lead to successful second language acquisition because the general social-psychological language development and culture shock may have a negative effect on the adult learners' attitudes, motivations, and empathic capacity.

Furthermore, he identified initiating factors, cognitive process, and linguistic results in order to explicate the issue of age in second language learning. According to this identification, he claims that, in the case of child L2 learners, the initiating factors, such as attitude and motivation

are favorably tuned or sufficiently neural so that when exposed to the target language, their cognitive process, such as generalization and imitation will automatically function to produce the adequate L2 linguistic results.

However, in the case of adult L2 learners, the development of firm ego boundaries and motivational orientations that are related to social and psychological maturation seems to place constraints on the initiating factors. Then these constrained initiating factors may block the cognitive process from operating on the target language data to which adult L2 learners are exposed.

With regard to adult L2 learners' acquisition, Schumann suggests that under the right conditions, unlike biological maturation, the initiating factors in adult L2 learners can be improved in order to acquire successful second language learning. Thus his ideas imply that child and adult L2 learners may differ in variables, such as attitude, motivation, empathy, self-esteem, ego-permeability, and perceived social distance. These variables may impede L2 acquisition in different ways. Krashen's (1982) Affective Filter seems to be one of those variables. He insists that Affective Filter in some unspecified ways stops input from reaching the brain areas responsible for language acquisition.

Long (1990), however, points out that, while the explanations for those variables seem to be persuasive, those explanations include the following problems: (1) Children vary in those areas (variables such as attitude, motivation, empathy, self-esteem, ego-permeability, and perceived social distance; on the contrary, their language development does not. (2) The claim offers no explanation as to why different linguistic domains are constrained at different ages, for instance, phonology before syntax.

(3) The precise claim is unclear. Just which of those variables, in what combinations, and to what degrees, are supposed to affect learning, and why? The claims made for those variables will not be testable or falsifiable.

In addition, aforementioned Shirahata's study (1995) showed that the child L2 acquisition of the English article system is more native-like than the adult L2 acquisition of the English article system. The adult L2 subjects in this study earned Ph.D. degrees successfully in the United States. It is difficult to evaluate these successful adult L2 learners as having negative attitudes toward learning a language, low motivation, and a strong Affective Filter. Thus the explanations through those variables, such as motivation and social distance, seem to be unable to explain more details of ultimate attainment in adult L2 learners.

While Schumann and Krashen's studies insist on the importance of variables, such as motivation and social distance, and suggest that the age of learners is irrelevant for the acquisition of second language, Chambers and Trudgill (1980), from the socio-linguistic points of view, claim that learners who begin learning an L2 after the onset of puberty are unlikely to acquire a native speaker-accent and grammatical ability. They investigated the variants of one phoneme in the speech of different generations of speakers in England. From the result that the younger generation used non-standard variants, they suggest that pre-pubertal younger speakers are subject to social influence from their peers and are likely to acquire a native-speaker accent.

On the contrary, Preston (1989) insists that pre-pubertal children may not be subject to this peer pressure and therefore, more likely to share external norms as they have not formed their own identities yet.

He concludes that children are not resistant to L2 learning in foreign language settings without the threat to their identities, and are able to attain a native-like level of second language.

As can be seen from the aforementioned studies, a social explanation of age-related effects in L2 acquisition seems to be only a partial explanation and unable to explain more details of L2 ultimate attainment in adult and child learners.

### 3. The Role of Universal Grammar in Second Language Acquisition

According to Ellis (1994), Universal Grammar is a term used by Chomsky and refers to the abstract knowledge of language that children bring to the task of learning their native language. Universal grammar constrains the shape of the particular grammar children are trying to learn, and consists of various principles that govern the form grammatical rules can take. Some of these principles are parameterized.

In the case of second language acquisition, however, the main topic of research is whether adult L2 learners have access to Universal Grammar or not. Ellis (1994), for example, distinguishes access to UG into four possibilities. They are (1) the complete access view, (2) the no access view (sometimes referred to as the Fundamental Difference Hypothesis), (3) the partial access view, and (4) dual access view. Cook (1996), on the other hand, presents three possibilities. They are (1) direct access to UG, (2) no access to UG, and (3) indirect access to UG.

The complete access view or direct access view shows that adult L2 learners have full access to UG principles and will be able to attain full linguistic competence. This view supports the idea that no critical period exists for blocking L2 acquisition.

The no access view or no access to UG shows that adult L2 learners no longer have full access to UG principles and fail to achieve full linguistic competence. This view suggests that general learning strategies replace UG.

The partial access view or indirect access to UG shows that adult L2 learners have full access to UG principles but can have only access to those parameters that are operative in their L1. Adult L2 learners may be able to reset L1 parameters by means of general learning strategies. Thus adult L2 learners cannot acquire all linguistic competence.

With regard to the dual access view, Felix (1985) has advanced this position as the Competition Model. This model offers the idea that while adult L2 learners have access to UG, this access is partly blocked by the use of general learning strategies. Thus, adult L2 learners fail to achieve full linguistic competence, and manifest similar and different linguistic behavior to child L2 learners.

Among these four possibilities, the complete access view seems to be the most questionable because this view is based on the assumption that no critical period exists. However, numerous experimental studies show that adult L2 learners cannot attain native-like levels of competence. These studies present the fact that the ability to acquire a native-like level of L2 competence gradually declines with age. Nevertheless, adult L2 learners, past puberty, seem to be still able to acquire a certain level of a second language. Therefore, supporting the partial access view seems to be appropriate because this view indicates that accessibility via the learner's L1 can be possible.

While the argument about adult L2 learners' access to UG is insightful and vigorous, exploring the role of core and periphery grammar based

on UG theory also seems to be meaningful. According to Ellis (1994), core grammar consists of universal properties of language that are considered to be innate in human beings. The periphery consists of language-specific grammatical properties. Based on this UG theory, language acquisition can be considered the combination of the acquisition of core grammar, periphery grammar, and lexicons. Thus researchers should investigate the relationship between age and the acquisition of core grammar, periphery grammar, and lexicons in order to explore ultimate L2 attainment in adult and child learners.

The aforementioned study of Johnson and Newport (1989) focused on the relationship between the age of learning and the acquisition of periphery, language-specific grammatical properties of L2 English learners. Especially their study covered a range of grammatical properties of English, such as determiners, plural, verb sub-categorization, past tense, word order, and other grammatical properties.

On the other hand, Johnson and Newport (1991) focused on the relationship between the age of learning and the acquisition of core grammar. This study supports the partial access to UG in adult L2 acquisition. Johnson and Newport investigated to what extent critical period effects can be applied to universal properties of language that are considered to be innate in human beings. They administered grammaticality judgment tests to native Chinese speakers who had learned English as a second language, and investigated the acquisition of universal principle subadjacency that is considered part of core grammar.

The subjects of this study arrived in the United States between the ages of four and thirty eight years and were immersed in English for a number of years. Chinese was considered to be an ideal choice as a native

language because wh-questions in Chinese do not involve movement. This means that even if the subjects arrive at the correct answers for English subjacency structures, it is not because of strict transfer from Chinese. The subjects were divided into two groups according to the age of arrival in the United States. One group was twenty-three adult Chinese speakers who had arrived in the United States after the age of seventeen. The mean age of their arrival was 25.8 and an average stay in the United States was 6.2 years. Another group was twenty-one Chinese speakers who had arrived in the United States from four to sixteen years of age. The mean age was twenty and an average stay in the United States was 9.6 years.

The subjects listened to aurally presented English sentences and were asked to make a judgment about their grammaticality. The results of this study goes as follows: Linguistic universals, such as subjacency become less accessible to L2 language learners with increasing maturation. In other words, the ability to access the subjacency principle undergoes a gradual decline with the age of arrival or age of acquisition. This result supports the claim that a critical period or sensitive period exists for the acquisition of language. However, there appears to be some residual ability to learn a language even during adulthood. In other words, judging from the test results, adult L2 learners seem to have some partial access to UG, but in a weakened or more errorful way.

From the results of their two studies, Johnson and Newport conclude that the critical period hypothesis is not only for the acquisition of language-specific grammatical properties, but also extends to the acquisition of core grammar, universal properties of language that are considered to be innate in human beings.

## Conclusion

According to the review of research, while child L2 learners seem to acquire a native-like level of proficiency in L2 with only adequate input from the target language environment, adult L2 learners seem to have difficulty acquiring a native-like level of proficiency from the same environment as child L2 learners. Despite this difficulty, adult L2 learners can still learn a language, especially through formal instruction. However, as for attaining the ultimate level in L2, child learners seem to be superior to adult learners because of the existence of the critical period.

With regard to educational implications, child L2 learners may not need to receive grammar instruction consciously in the target language. On the contrary, adult L2 learners may need conscious grammar instruction by using general learning strategies. Thus formal instruction is probably useful to facilitate adult L2 learners' linguistic competence.

## References

- Bialystok, E., & Hakuta, K. (1994). *In Other Words: The Science and Psychology of Second-Language Acquisition*. New York: Basic Books.
- Chambers, J. & Trudgill, P. (1980). *Dialectology*. Cambridge: Cambridge University Press.
- Cook, V. J., & Newson, M. (1996). *Chomsky's Universal Grammar* (2nd ed.). London: Blackwell.
- Curtiss, S. (1977). *Genie: A Psychological Study of a Modern-Day "Wild Child."* New York: Academic Press.
- Ellis, R. (1994). *The Study of Second Language Acquisition*. London: Oxford University Press.
- Felix, S. W. (1985). More evidence of competing cognitive system. *Second Language*



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*Research*, 1, 47-72.

- Grimshaw, G. M., Adelstein, A., Bryden, M.P., & Mackinnon, G.E. (1998). First-Language Acquisition in Adolescence: Evidence for a Critical Period for Verbal Language Development. *Brain and Language*, 63, 237-255.
- Johnson, J., & Newport, E. (1989). Critical period effects in second language learning: The influence of maturational stage on the acquisition of English as a second language. *Cognitive Psychology*, 21, 60-90.
- Johnson, J., & Newport, E. (1991). Critical period effects on universal properties of language: The status of subadjacency in the acquisition of a second language. *Cognition*, 39, 215-258.
- Krashen, S.D. (1973). Lateralization, language learning, and the critical period. *Language Learning*, 23, 63-74.
- Krashen, S.D., Scarcella, R.C., & Long, M.H. (1982). *Child-Adult Differences in Second Language Acquisition*. Rowley, MA: Newbury House.
- Newport, E. L. (1990). Maturational Constraints on Language Learning. *Cognitive Science*, 14, 11-28.
- Lenneberg, E. H. (1967). *Biological Foundations of Language*. New York: Wiley and Sons.
- Long, M. (1990). Maturational Constraints on Language Development. *Studies in Second Language Acquisition*, 12, 251-285.
- Patkowski, M. (1980). The Sensitive Period for the Acquisition of Syntax in a Second Language. *Language Learning*, 30, 449-472.
- Penfield, W., & Roberts, L. (1959). *Speech and brain mechanism*. New York: Atheneum.
- Preston, D. (1989). *Sociolinguistics and Second Language Acquisition*. Oxford: Blackwell.
- Schumann, J. H. (1975). Affective Factors and the Problems of Age in Second Language Acquisition. *Language Learning*, 25, 209-235.
- Shirahata, T. (1995). The Japanese Learner's Long-term Attainment in English Articles. *JACET Bulletin*, 26, 113-130.
- Towell, R., & Hawkins, R. (1994). *Approaches to Second Language Acquisition*. Clevedon: Multilingual Matters.
- Whitaker, H.A., Bud, D., & Levenson, S. (1981). The neurolinguistic aspects of language acquisition and bilingualism. *Annals of the New York Academy of Science*, 379, 59-74.