

What Factors are Predictors of Successful Second Language Acquisition?

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Abstract

This study investigates the effects of age of onset (AO) along with length of stay (LS) on the proficiency of English as a second language. Subjects include 48 Japanese high school students who had lived in the United States for more than two years ($M = 5.79$ years) and received formal instructions in English at local schools. The dependent variables, English pronunciation in terms of the degree of foreign accent (FA) and attainment in syntax, lexis, and morphological as measured by TOEFL scores, were examined to find correlations with the independent variables AO and LS.

Subjects' FA highly correlates with their AO (.4988), but TOEFL scores failed to correlate with AO (-.2760). LS negatively correlates with FA (-.4826) but positively correlates with TOEFL (.4135). Observed FA is decreased with the younger AO but LS is found to better predict overall attainment of English as a second language. Critical period for second language acquisition, in the case of phonology, seems to exist, but not overtly observed for other domains of the target language in this study.

Introduction

Adults are believed to be less successful at learning a second language than children. As is often the case with a family living abroad, the younger children can successfully acquire the target second language while adults can master it only at a minimum level. Language researchers have tried to explain this phenomenon by developing the notion of critical period (CP). Critical period is a biological term which refers to a limited stage of life during which a specific competency or

activity is acquired. Lenneberg (1967) asserted that the critical period is from the age of around two to about 12 years old, based on his observations of deaf children. Most of his findings are based on first language acquisition which begins at birth and continues through at puberty, with continuing acquisition of new vocabulary and subtleties of the language throughout one's adult life (de Villiers & de Villiers, 1978). More complex processes account for second language acquisition (SLA) and Lenneberg's claim underwent heavy criticism. Singleton (1989, p. 44) states, "... there seem no good grounds for believing that there is a particular level of physical maturation in early child development where language suddenly emerges and a critical period for its acquisition begins." Though Lenneberg lacked ample research data to support his conclusions he refers to SLA from the standpoint of maturational constraints and says, "automatic acquisition from mere exposure to a given language seems to disappear after this age [puberty] and foreign language has to be taught and learned through a conscious and labored effort" (Lenneberg, 1967, p.176).

In SLA studies, discussion of the notion of a critical period for second language acquisition has broadly revolved around two major positions. One, derived from first language evidence, states simply that younger second-language learners are more successful than older learners and two, that puberty is the start of a decline in second language acquisition. Asher & Garcia (1969) investigated 71 Cuban immigrants to California ranging in ages from 7 to 19 years old. They discovered AO to be a good predictor of successful acquisition of pronunciation. Oyama (1982) examined 60 male Italian immigrants to the U.S., at ages ranging from 5 to 18 years, by evaluating their English oral and aural linguistic skills. The analysis of results with regard to accent, which deals with AO and LS respectively, revealed that "... an extremely strong AO effect was found... but virtually no effect from LS in the United States" (Oyama, 1982). The listening comprehension test scores revealed a clear AO effect.

Furthermore, Tahta, Wood, & Loeventhal (1981) conducted a study in the United Kingdom to examine FA and reported, as far as pronunciation is concerned, an inverse relationship existed between AO and the possibility of attaining native-like pronunciation (Uematsu, 1997). Other research reveals negative AO effect on the achievements of skills other than oral, such as grammar learning (Johnson, 1992; Harley & Hart, 1997).

The counter to "the younger the better" notion, Asher & Price (1967) assert that older second language learners are more successful than younger learners at ultimate attainment. The findings which support this notion do not originate from language acquisition in a naturalistic environment but from the study of language learning performance following formal instruction. Asher & Price (1967) found that adult and adolescent subjects consistently performed better than younger subjects in

responding to oral directions in Russian after a brief session of instruction in Russian. Ekstrand (1976) tested the English pronunciation of 1000 Swedish primary school children, ages 8 to 11, where they imitated a number of English words and sentences. The findings reveal that pronunciation improved, almost linearly, with age. But, the pronunciation scores achieved by pupils on the tests increased steadily with age.

Further evidence was proceeded by Walberg, Hase, & Pinzur-Rasher (1978), who asked 352 Japanese children, ranging in age-levels from kindergarten to 12th grade, to rate the difficulty of English and Japanese in respect to reading, writing, speaking and listening. On the other hand, the American teachers were asked to rate overlapping subjects of this data. The two results were combined and then analyzed. It was found that older children reached the norms of their American peers in the same amount of time that younger children took to reach the norms of their age-peers, thus it can be inferred that older children learn faster (Thogmartin, 1982; Lowenthal and Bull, 1984; Collier, 1987).

In an attempt to make sense of these contradictions of results, Krashen, Scarcella, & Long (1979) made distinctions between short-term and long-term attainment in SLA and stated three hypotheses 1) adults proceed through early stages of syntactic and morphological development faster than children where time and exposure are held constant 2) older children acquire language faster than younger children in early stages of syntactic and morphological development where time and exposure are held constant; and 3) acquirers who begin natural exposure to second languages during childhood generally achieve higher second language proficiency than those people beginning as adults.

Krashen *et al.* (1979), limit their claim about the short-term attainment of adults and older children to syntax and morphology as well as their claim about the long-term attainment of children. They also distinguish between formal and informal learning situations, namely those with naturalistic exposures. While older learners tend to outperform younger learners, in respect to their initial stages of learning, long-term performance is higher, generally speaking, the earlier the exposure is to the target language. This position has been widely acknowledged, even by those researchers who might have earlier held a contrary view (Singleton, 1989, 1995; Long, 1990; Ellis, 1994).

In pursuing these qualitative differences of acquisition, the aim of this study is to investigate the differences in ultimate attainment among young second language learners who began natural exposure to English as a second-language during their childhood. Will an earlier AO of the target second language (e.g., English) lead to a higher second language proficiency? This paper's hypothesis statement is a further inquiry into Krashen's *et al.* (1979) hypothesis number three, which is both vague and under investigated. Only in its general sense, hypothesis number three has

gained support as stated before (Patokowski, 1980; Scovel, 1988; Singleton, 1989; Long, 1990). In order to know the qualitative differences of second language acquisition, two independent variables were examined: FA and TOEFL test scores to examine the syntax, lexis, and morphological attainments. The dependent variables include AO and LS.

The three hypotheses expected are: 1) a negative correlation between AO and FA, 2) there is a positive correlation between AO and TOEFL test scores, and, 3) there are strong correlations either between LS and FA or between LS and TOEFL attainment if conditions 1) and 2) are met, since greater LS imply an earlier AO.

Method

Subjects

Subjects include 48 Japanese high school students (Male = 22; Female = 26) ranging in ages 15 to 18, who had lived in the United States for more than 2 years ($M = 5.79$) years. All subjects had attended local public schools in the U.S. upon arrival and until a few days before their return to Japan. Some students had been in English as a Second Language (ESL) classes for one year, while others spent more than two years in ESL classes before they qualified to be involved in the mainstream classes. Most of the subjects had completed ESL classes and had some years of experience in mainstream classes. No graduate from a Japanese-operated school in the U.S. was included in this study. No students spent more than one year at a Japanese local school in Japan before entered Osaka Intercultural Academy which accepts returnee students from overseas and offers them special education in Japanese vocabulary to catch up with their peers in Japan while supporting the language and culture these students acquired abroad. Of these 48 voluntary participants, 25 were 11th graders, 22 were 10th graders and one was a 12th grader.

Data collection

Data collection consisted of two parts: data to assess the degree of the subjects' foreign accents and the subjects' general English proficiency other than pronunciation as measured by total TOEFL score which is comprised of three parts (e.g., listening comprehension, structures, reading comprehension) in about equal proportion.

For phonological attainment, subjects consented to tape-record interviews in English which lasted for three minutes. Subjects expanded upon a random topic such as, "My first day at school" when presented with it by the interviewer. The subjects were tested individually at school, in a relaxed environment, and knew their performance was being tape-recorded for later scoring and checking. Subjects

were allowed to repeat the language sample as many times as they cared to until they finally felt satisfied. As the subjects were asked to speak English in their natural way, some tried to speak slowly while others spoke using quick and relaxed English.

For examining subjects' second language (L2) competency, other than pronunciation, TOEFL test scores which contain syntactic, lexical, morphological understanding were used. The subjects were asked to take the TOEFL test and to report their scores later.

Data analysis

After producing voice samples of the 48 subjects, and randomly mixing them up, the recordings were then listened to by two American English teachers who had considerable experience in teaching junior and senior high school students both inside and outside of the U.S., about ten years each. They had never taught the subjects participating in this study. These two American teachers have advantages as raters since they have gained extensive exposure to different types of English not only in the United States but also overseas, unlike other native English speaking teachers or just native-born Americans. Also, because they have extensive and varied teaching experience, they know more about variations and dialects of American English. The results were scored in answering the question, "Is this student an American-born native?" with the 'Yes' or 'No' choice by the raters. In the case of 'No', the degree of foreign accent should be specified on a five-point scale (0 = native English speaker accent; 1 = with very slight foreign accent; 2 = with slight foreign accent; 3 = with a noticeable foreign accent; 4 = with a heavy foreign accent), agreeing that scale 1 meant acceptable native-like performance and 'Yes' meant zero foreign accent, in other words, full native English speaker performance. TOEFL scores were also collected and prepared for statistical analysis.

Findings

Results

Table 1

Variable	Mean	S.D.	Min.	Max.	N
FA	1.54	1.05	0	4	48

LS	5.79	2.63	2	13	48
AO	8.15	3.05	1	14	48
TOEFL	591.15	32.70	540	667	48

Table 1 shows the mean values, standard deviations, minimum range, maximum range, and the numbers of cases. Foreign Accent (FA) on a five-point scale, Length of Stay (LS) in years, Age of Onset (AO) in years, and TOEFL as gross points earned.

Table 2

	AO	FA	LS	TOEFL
AO				
FA	.4988**			
LS	-.9201**	-.4826**		
TOEFL	-.2760	-.3472*	.4135**	

* - Signif. LE .05 ** - Signif. LE .01 (2-tailed)

Table 2 shows the correlation coefficient with AO strongly correlated with FA but not correlated with TOEFL scores, by the two-tailed analysis. LS is strongly correlated both with TOEFL score and FA ($p < .01$) on the two-tailed test. TOEFL score is also correlated with FA ($p < .05$). When the correlation coefficient was examined by one-tailed analysis, a correlation between any two of these variables became significantly correlated.

Chart 1 shows a negative relationship between FA and AO, that is, FA lessened as AO grew younger. [See charts 1, 2, 3 and 4 on the next 4 pages.]

[The charts are not available for the online version of the article.]

In Chart 2, curvefits show the relationship between FA and LS. It is indicated that generally as LS becomes longer, notice of FA becomes less.

Chart 3 shows subjects' TOEFL attainment by AO, with TOEFL score declining as AO becomes older.

Chart 4 displays a positive correlation ($p < .01$) between TOEFL scores and LS.

Discussion

The findings of this study show both support for and rejection of the hypotheses. The results support the first hypothesis: There is negative correlation between AO and FA. But hypothesis two, there is positive correlation between AO and TOEFL test scores, is not supported. Since both conditions for hypothesis three were not met, it is rejected. Although it failed to support the second hypothesis, the number in the data turned out to be very close to the significant level, $r = -.2760$, $p = .058$ by two-tailed analysis. Additionally, there were statistically significant correlations found either between LS and FA or between LS and TOEFL that support the validity of hypothesis three, though both of hypotheses were not satisfied. With an improved research design, AO and TOEFL scores might actually be highly correlated. This study supports the concept of the "the younger the learner, the better the mastery of pronunciation" in the ultimate attainment of the pronunciation of the target second language. The critical period for second language acquisition of phonology seems to exist but these results fail to explain the existence of the critical period. Bley-Vroman (1989) claims that older learners use general cognitive skills, such as problem-solving, as an alternative to the innate language acquisition device which children rely on. According to Bley-Vroman's (1989) fundamental difference hypothesis (FDH), children learn their native dialect completely, regardless of their level of verbal ability, because they employ language-specific mechanisms of implicit learning, as in the form of universal grammar (UG). He claims that UG is inoperative in late second language acquisition, but that older SL learners are able to access UG-like principles as an alternatives from other general cognitive sources and thus treat the second language as grammar. In other words, if the critical period hypothesis is interpreted as applying only to implicit language acquisition, no exceptions should be observed (Singleton, 1995; Ioup, Boustagui, El Tigi, & Moselle, 1994; Bongerts, van Summeren, Plaken, & Schils, 1997).

Conclusion

This study shows the optimal AO and LS for the lowest FA, based on the frequency analysis, AO is at 6.50 years old with LS at 7.75 years. Also, optimal AO and LS for highest TOEFL scores with AO at 6.80 years old and LS at 8.25 years.

Though it is thought-provoking to investigate optimal AO for SLA, we have to take into consideration study conducted in the field of first language acquisition when we try to discuss second language acquisition. The overwhelming evidence in first language studies suggest that language acquisition is a continuous process which begins at birth and continues well into adulthood and even, at least in some aspects (i.e., lexis), into middle and old age. But second language learners can start to learn the target language well beyond puberty and some can even master that second language in the long run. This is the major quality difference between SLA and first language acquisition. And the SLA process is more complicated in the sense that it is always started after the first language is established. Other factors influence proficiency in SLA, such as, their native language and culture transfer, interlanguage, the learned language, socio-cultural pressures, the quality of the ESL or EFL class settings, and the experience of formal instruction. These subjects initially learned English as a second language and now continue it as a foreign language. This adds another variable to the study which should be re-investigated at the earliest opportunity.

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