

Is Native-like Pronunciation Possible?

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There has been much research concerning the critical period for phonology as to the precise ages children will acquire native-like pronunciation in a second language. However, there has also been some research claiming that non native speakers who learn foreign languages after puberty are able to acquire native-like or near native-like pronunciation if those learners have engaged in pronunciation courses, lived in a foreign country for an extensive period of time, and or possess an ability to mimic sounds. Therefore, this paper will chronologically review some of the significant studies concerning the critical period of phonology and, with the recognition and inclusion of key factors, propose a study which may identify important variables from individuals who may possess the unique ability to produce native-like pronunciation after puberty.

BACKGROUND

To understand how the critical period hypothesis came to be, it is necessary to revert back to the development of the hypothesis itself. In the book, A Time to Speak: A Psycholinguistic Inquiry into the Critical Period for Human Speech, the author Thomas Scovel cites several researchers who have contributed to the understanding of the critical period hypothesis. Among these he first cites the Canadian neurologist Wilder Penfield. Penfield, highly knowledgeable about the functions of the human brain, was according to Scovel, the first who, “articulated the belief that neurological mechanisms in the young human brain were primarily responsible for the reputed ease and accuracy displayed by children in acquiring a “second tongue.” In addition, Scovel also says that throughout the 1950’s Penfield stated the following with regards to brain development involving language attainment and age.

The time to begin what might be called general schooling in secondary languages in accordance with the demands of the brain capacity and normal psychology is

between four and ten. The child sets off for school then, and he can still learn new languages without imposing the speech units of his mother tongue.

(Scovel, 1988, p. 54)

Although here Penfield offers a range of time from 4 to 10 years of age in which second language acquisition is advantageous to acquire, Scovel argues that Penfield's claims are inconclusive in that there are some concerns with regards to his theories. For example, Scovel addresses the fact that Penfield was not precise in defining the "optimal" age in which the critical period takes place. In addition, Scovel points out that Penfield did not break down the critical period into different aspects of language learning such as semantics and syntax, but rather language learning as a whole. In sum, Scovel essentially states that Penfield needed to be more precise if his claims were to be significant to language learning.

However, Lenneburg, another important researcher in this field, continued where Penfield left off. In 1967, Lenneburg made significant findings related to language attainment when he conducted research with children who had brain injuries. As a result of this work, Lenneburg was the first to, "document the biological or neurological basis for the critical period for language learning." In his findings, he states the following:

Most individuals of average intelligence are able to learn a second language after the beginning of their second decade, although the incidence of "language learning blocks" rapidly increases after puberty. Also, automatic acquisition from mere exposure to given language seems to disappear after this age and foreign languages have to be taught and learned through a labored effort. Foreign accents cannot be overcome easily after puberty. However, a person can learn to communicate in a foreign language at the age of forty.

(Lenneburg, 1967, p. 176)

It appears that Lenneburg expanded the critical stage of language acquisition from Penfield's proposal of 4 to 11 years of age to post puberty or, more specifically, as Lenneburg says, "the second decade of life." In addition, Lenneburg's findings were also significant because his mention of "language learning blocks" making language learning difficult and his mention of the inability to overcome foreign accents after puberty were two issues that had not been addressed previously by Penfield.

PHONOLOGY

Phonology is a term which is used to refer to the sound patterns of a language. Evidence of the critical period hypothesis, with regards to phonology which focuses on

precise ages for accent-free speech, is largely supported by at least three studies conducted in the late 60's to the early 80's. Asher and Garcia (1969), for example, studied 71 Cuban immigrants in the United States who were from 7 to 19 years old. Most of the subjects, who had lived in the United States for five years, read four sentences into a tape recorder. When the recordings were completed, the tapes were given to 19 judges who were native speakers of English. The judges rated each speaker according to a four-point scale. The findings suggested that, of children who lived in the United States for more than five years, those who were six years old or younger had a high probability of achieving native-like pronunciation. Those immigrants who came to the United States between the ages of 7 and 13 however, had a 50% chance of attaining a native-like accent while those subjects who were 13 and older had little chance of attaining a native-like accent.

This finding is similar to Oyama's (1976) study which investigated the pronunciation ability of 60 Italian immigrants who were between the ages of 6 and 20 and lived in the United States for 5 to 10 years. Oyama discovered that whether or not one acquires an accent largely depends on the age that one was when they immigrated to the United States. Those children, for example, who arrived before 12 years of age had pronunciation close to those of native speakers of English, while those children of 12 years of age or older did not demonstrate native-speaker pronunciation. This study is significant because it revealed a more precise age in which a second language in terms of phonology is best acquired, that is, before the age of 12.

Finally, Tahta, Wood and Loewenthal (1981) studied immigrants from a variety of linguistic backgrounds who came to live in the United Kingdom. They examined 109 English as second language learners from 20 different languages whose ages at the time of the study ranged from 9 to 77. In addition to age, other factors such as gender, languages spoken at home, years of residence, in the L 2 country, musical ability, age now, and other languages spoken were also analyzed. The participants of the study read a paragraph of an English passage into a tape recorder and three judges marked each speaker's accent on a three-point scale. The results revealed that if learners began their study by age six, there would be no accent. However, if a language was learned after 12, there would be transfer of an accent. Also, although the use of English at home was a significant factor in staving off the development of an accent from ages 7 to 9, from ages 9 to 11, however, chances for accent-free English dropped 50% regardless.

During this period, some studies counter to the phonological findings of previous research were conducted by Neufeld (1978) who claimed to present counter evidence that the accent-free second language performance is possible beyond the age of six. In his study of 20 adults who received 18 hours of intensive phonological instruction in both Japanese and Chinese, three adults received a native speaker rating. This and similar

studies led Neufeld to claim that the critical period for phonology does not exist and that it is possible for learners to acquire a second language that is accent-free after six years of age. However, although Neufeld presented intriguing results from his studies, there are several criticisms against his claim. The most salient of these is perhaps the argument that the sample of phonological speech used in his studies were limited in that only short isolated phrases were tested rather than longer passages thereby making the pronunciation of words more simple to reproduce or imitate for the non-native speaker. Nevertheless, Neufeld's studies do shed light on the possibility that accents may be overcome, at least to some extent, through extensive phonological practice.

In more recent studies, Ioup, Boustagui, Eltiggy, and Moselle (1994) studied a case of an English speaker, Julie, who acquired native-like pronunciation of Egyptian Arabic after beginning language study around 21 years of age. When listening of sample recordings of free speech, the majority of the 13 judges, who were Arabic teachers, rated Julie as being a native or near-native speaker of Arabic. In addition, Julie was able to discriminate between different dialects of Arabic with 100% accuracy compared to native speakers of Arabic who averaged 85% accuracy as well as detect the differences between Egyptian accents, something that not many native speakers could detect. The authors point out that, in addition to keeping a notebook to record vocabulary, morphology, and useful expressions of Arabic, Julie also had a talent for mimicking accents. Mimicking may be a significant variable worthy of other study because similarly, Thompson (1991), who studied 36 Russian-born immigrants to the United States, found that, in addition to age of arrival, the ability to mimic, "appears to facilitate the acquisition of accurate pronunciation in L 2 in both informal and formal learning situations" (p. 197). Nevertheless, Ioup et al (1994) present compelling evidence that native-like pronunciation can be attained well after the critical period. However, in the case of Julie, it should be kept in mind that this study was conducted after she had been living in Egypt for 26 years. Therefore, both mimicking ability and length of stay together may be two significant factors to achieve native-like pronunciation.

Bongaerts, Planken and Schils (1995) examined Dutch learners of English whose ages ranged from 19 to 52 years of age. The participants were asked to complete four tasks: a three minute talk, read a text of 84 words, read 10 short sentences consisting of 5 to 10 words, and read aloud 25 English vocabulary words, which varied from 1 to 5 syllables. All of the tasks were audio recorded and four native speakers who spoke Royal Pronunciation British English rated each speech sample using a five-point scale. The results proved that the native speaker judges could not distinguish all the group of speakers who were learners of English from the group who were native speakers of English concluding that there are some late learners that perform at the native-speaker level. Similarly, Bongaerts, Van Summeren, Planken, and Schils (1997) conducted another study using Dutch learners

of English in which the subjects' accent ratings were based on speech samples of six English sentences. This time they chose to use sentences for their second study because sentence production in the previous study produced the lowest results. Nevertheless, like the previous study, some proficient learners of English attained ratings similar to those of native speakers.

Although these findings challenge Scovel's (1988) claim that the opportunity for accent-free speech stops around the age of 12, the subjects used in these studies were university students who, "were almost exclusively taught in English, were schooled in phonetics and attended pronunciation tutorials" (p. 44). Such training could have helped non-native speakers pass as native speakers. Finally, since Dutch is typologically similar to the English language it may have been easier for the Dutch learners to imitate native speakers of English than compared to speakers of other non Germanic languages such as Romance languages (French, Spanish, and Italian) or Asian languages (Chinese, Japanese, and Korean).

Recently, Rabia and Kehat (2004) conducted a study in which they assessed the potential variables of late starters (i.e. language learners after puberty) for 10 subjects who had native-like Hebrew pronunciation. For the first task, five Hebrew native speakers used a five-point scale to assess the accent of speeches in which subjects either described a trip or a favorite recipe for 15 minutes. Next, as a result of the subjects' availability, 5 of the original 10 subjects participated in three additional tasks in which they read from a paragraph, read sentences, and read words from a list. All four tasks were recorded on audiotape and presented to the judges in random order to prevent voice identification. Results for the five subjects who participated in all four tasks indicated that the task which required subjects to read from a passage seemed to reveal more of an accent than compared to the tasks of free speech, reading sentences or reading from the word list. Nevertheless, the authors claimed through their overall findings that there were, "some SL learners who succeed in achieving a near-native or native-like accent despite having been exposed to the language after puberty" (p. 94).

This claim seems compelling, however, after close examination two of the four subjects, who produced the more significant results, did not obtain a perfect score of 5 representing "no foreign accent at all: definitely native," on any of the four tasks and, specifically with regard to the reading task, the same subjects scored 3 and 3.6 respectively indicating that the subjects' accents were well marked and did not possess native-like pronunciation. Also, in addition to the findings revealed in the task tables, although the authors of this study attempt to depict the linguistic upbringing of each of their subjects, they did not systematically break down the variables which could have influenced the attainment of native-like pronunciation. That is, in describing the content in the interviews, the authors of this article list 11 possible variables which could have impacted pronunciation.

Unfortunately, however, these 11 variables are neither statistically analyzed nor separately addressed as to the impact they may have on pronunciation. There is some mention of the use of the L 1 at home which is similar to the Tahta et al (1981) study as well as awareness and motivation factors to learn a language; however, the article merely concludes, “although age appears to play a significant role in predicting the level of pronunciation accuracy in general... we cannot ignore the fact that a variety of additional variables may contribute greatly to one’s level of accented speech” (p. 96). Similar to Tahta et al (1981) in which eight separate variables were individually assessed for their impact on language pronunciation, if Rabia and Kehat were to do the same for the 11 variables in their study, there would be a clear understanding of which factors in particular contribute to native-like pronunciation.

For example, upon a closer examination of subjects’ profiles in coordination with the table revealing the mean scores of judges evaluations across the four tasks, it appears the variable concerning the amount of years spent in the country along with variable concerning the motivation to speak the L 2 without a native-like accent for general/professional reasons, may be significant. Specifically, of the four subjects who arrived in Israel after puberty (age 12), two were teachers, one was a translator and one had worked in factories. However, for all four tasks, the teacher who had lived in Israel for 23 years and the translator who had lived in Israel for 24 years scored about the same but significantly better than the teacher who had lived in Israel for 11 years. Interestingly, the one subject who had lived in Israel working in factories for 56 years had the lowest score even though she had spent just two years less than the combined tenure of the other three subjects (translator 23 + teacher 24 + teacher 11 = 58 total years versus a factory worker of 56 years).

These results are most likely due to the fact that the teachers and translators are public figures who are more conscious of their pronunciation than compared to other occupations whose exposure to public situations may be limited. In any event, this insight is related to Moyer’s (1999) study which examined 24 graduate students studying German after the critical period. This study found that professional motivation was a statistically significant variable in combination with other factors which contributed to native-like pronunciation. Specifically, Moyer states that while “university-level teaching showed a strong relationship to outcome, it did not indicate optimal performance” but, “subcategories of professional writing or translation and professional speaking actually indicated, production closer to native level” (p. 96). As a result, the quality of one’s pronunciation may be attributed to one’s profession. However, this is not to say that the length of residence in a country is not significant. As mentioned previously, the teacher who lived in Israel for 23 years scored significantly better on all four tasks than the teacher who lived in Israel for 11 years. Rather, what seems to be important is together both profession in combination

with length of residence may lead to native-like pronunciation.

RESEARCH QUESTION

The early studies by Asher and Garcia (1969), Oyama (1976), and Tahta, Wood and Loewenthal (1981) seem to clearly demonstrate that the probability of attaining native-like pronunciation is greatest if a child arrives in his or her second language country by the age of six or younger. After age six, the possibility to acquire and develop pronunciation which is accent-free diminishes significantly until the age of 12 when there is little if any chance. However, Neufeld (1978), Bongaerts, Planken and Schils (1995), and Bongaerts, Van Summeren, Planken and Schils (1997) counter earlier claims citing results that second language learners can pass with native-like pronunciation if they are given opportunities to extensively practice pronunciation. In addition, both in Ioup, Boustagui, Eltiggy and Moselle's (1994) and Rabia and Kehat's (2004) studies, subjects who had lived several years in a foreign country and who were seen to have adept mimicking abilities could pass as having native-like pronunciation. Mimicking has also been cited as contributing to pronunciation (Thompson, 1991). Finally, as discussed previously, one's profession may be significant to the quality of one's pronunciation (Rabia and Kehat, 2007; Moyer, 1999). In light of these findings, perhaps non-native speakers who are affected by these factors can pass as having a native-like pronunciation. Therefore, we propose a study to investigate the following research question: can non-native individuals who have 1) lived in a foreign country, 2) engaged in pronunciation practice, 3) hold a job in which English communication is important, and 4) have an ability to mimic sounds, pass as having native-like pronunciation?

METHODS

Participants

There are a number of prerequisites for choosing the participants for this study. First, a minimum of three judges who are native speakers of English should be included. Second, at least three non native speakers must be evaluated as to whether they have native-like pronunciation. In addition, the participants should meet the following criteria:

- 1) Lived in a major English speaking country for at least 10 years.
- 2) Must have formally or informally engaged in pronunciation practice.
- 3) Work in an occupation in which English communication on a regular basis is important.
- 4) Believe they possess an ability to mimic sounds.

In addition to the three non-native speakers, at least one native speaker should be

included in order to prevent judges from being aware of those participants who are non-native speakers of English and those who are not.

Materials

Several materials and facilities will be used in this study. First, to obtain students' pronunciation, an audio device such as a tape recorder will be needed. Second, access to a quiet room will be necessary in order to record and listen to students' pronunciations in a quiet atmosphere. Third, since each participant will be subjected to four separate test exercises, four separate handouts should be prepared for the participants to read. For example, one handout should contain a word list and the second or following handout should contain a list of five sentences. Next, or fourth, an evaluation form should be prepared in advance in order for the judges to rate students' pronunciation from non-native to native-like on a five-point Likert-scale for all four test exercises (see appendix A).

Procedure

A number of steps should be carried out to implement this study. To begin, when the judges and participants have been selected, on the appointed day and time, participants would be asked to go to a reserved room where they would engage in the pronunciation text exercises one by one. The intermediary facilitating the test would be an individual other than the judges (me). While the participant is completing the test exercises, his or her responses would be recorded for the judges to be evaluated at a later date. Needless to say, before the test exercises, participants would be unaware of the type of tasks they are asked to perform. Likewise, participants would be asked not to discuss the exercises with other participants until the study, in its entirety, is completed. Next, after all the test exercises from all the participants (including the native speaker) have been recorded, the recordings would then be presented to the judges in order to evaluate the pronunciations. With regard to the manner the test exercises are presented, the recordings of the first test exercise of the word list, for example, may be presented to the judges in sequential order. That is, participant #1 followed by participant #2, etc. However, for the recordings of the second test exercise of sentences, judges may first hear the recordings of participant #4 followed by participant #2. Having the recordings arranged and presented in random order prevents judges from becoming familiar with the voices of the participants. Finally, when the judges complete their evaluation of all the participants' test exercises, the data from the judges' evaluation forms would be typed into a statistical program, such as SPSS, in order to produce descriptive statistics and statistical graphs to represent the differences of scores between the participants.

RESULTS

Descriptive Statistics

In order to discuss the findings, first the overall descriptive statistics of averages consisting of the combined four test exercises would be reported. Such a table would place the independent variables of *English Teacher (ET)*, *English Interpreter (EI)*, *Audio Journalist (AJ)* and *Native Speaker (NS)* listed horizontally along the top row of the table. In addition, the headings of *mean*, *standard error*, *standard deviation*, *skewness*, *standard error of skewness*, *kurtosis*, and *the standard error of kurtosis* would be represented along the left side column. At the bottom of the chart, a note indicating the *N* size would be listed as well. Finally, below the table, comments concerning the distribution of scores, as well as normality using + or - 1.96, as well as outliers using + or - 3.29 would be discussed in brief. The table, as described above, would be represented as follows:

Table 1

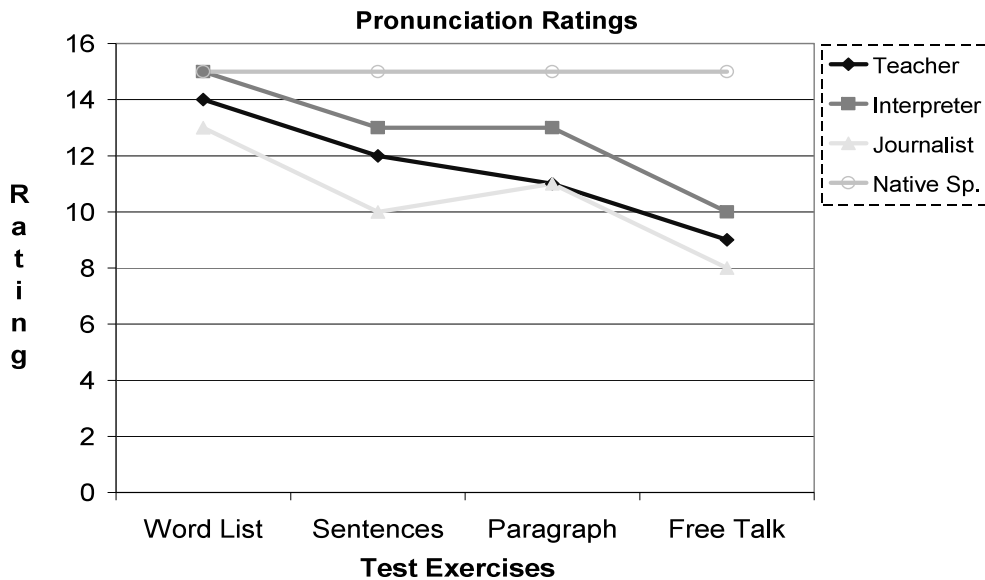
Descriptive Statistics for native-like pronunciation participants

Statistic	ET	EI	AJ	NS
<i>M</i>				
<i>SE</i>				
<i>SD</i>				
<i>Skewness</i>				
<i>SE</i>				
<i>Kurtosis</i>				
<i>SE</i>				

Note. N = 4

Technical Breakdown

In addition to the descriptive statistics, a line graph revealing the average scores of the four pronunciation test exercises for all participants would be included. Such a graph would place the names of the test exercises along the X axis while the rating scale, which would contain the combined average scores from the judges for each task, would be placed along the Y axis. Using this type of graph would help visualize how the non-native speakers compare to the native speaker participant and help reveal which particular test exercises proved easy or difficult for non-native speaker to pass as having native-like pronunciation. An example of the graph that may be used is as follows:



CONCLUSION AND DISCUSSION

The purpose of this study would be to examine individuals who may hold a unique background to learning the pronunciation of a second language. Specifically, in addition to being introduced to a second language after the phonological critical period, participants in this study would share four factors that have influenced pronunciation. 1) they would have lived in a major English speaking country for at least 10 years; 2) they would have engaged in formal or informal pronunciation study, 3) they would work in occupations in which English communication on a regular basis plays an important role, and 4) they would be individuals who believe that they have a knack or ability for mimicking sounds. In the past, studies have suggested that these four factors can influence pronunciation although the degree to which these variables are statistically significant, alone or together, is not clear. This being said, if this type of study yields significant results of native-like pronunciation being close to that of a native speaker, than future studies should be implemented in order to investigate to what extent or degree do each of the four factors (Occupation, Pronunciation Practice, Living Overseas or Mimicking Ability) influence the pronunciation of those learners who began learning English as a second language after the critical period for phonology. Such research may shed light about the importance of these factors.

Although there are presently several English pronunciations spoken today, the world is nevertheless becoming smaller due to technology. As a result, more and more workers from a variety of industries need to learn second languages past the critical period. Therefore, whether the goal is to enhance pronunciation for communications purposes, to

ingratiate oneself into a new community halfway around the world, and or to reduce discrimination that may result in acquiring an accent, the implementation of this type of study, or the studies which may follow as a result, will be increasingly important as globalization changes our lives.

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Appendix A
Rating Form

(Participant #1)

TEST EXERCISE	ACCENT				
	Non-native	Heavy	Marked	Slight	Native
Word List	1	2	3	4	5
Reading	1	2	3	4	5
Paragraph	1	2	3	4	5
Free Talk	1	2	3	4	5

Total Score = _____

(Participant #2)

TEST EXERCISE	ACCENT				
	Non-native	Heavy	Marked	Slight	Native
Word List	1	2	3	4	5
Reading	1	2	3	4	5
Paragraph	1	2	3	4	5
Free Talk	1	2	3	4	5

Total Score = _____

(Participant #3)

TEST EXERCISE	ACCENT				
	Non-native	Heavy	Marked	Slight	Native
Word List	1	2	3	4	5
Reading	1	2	3	4	5
Paragraph	1	2	3	4	5
Free Talk	1	2	3	4	5

Total Score = _____

(Participant #4)

TEST EXERCISE	ACCENT				
	Non-native	Heavy	Marked	Slight	Native
Word List	1	2	3	4	5
Reading	1	2	3	4	5
Paragraph	1	2	3	4	5
Free Talk	1	2	3	4	5

Total Score = _____