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The Relationship between Age and Foreign Accent in an L2

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Abstract Although a great number of studies have been conducted on the effect of age on second language learning, not much has been done on the correlation between age and foreign accent in an L2. The aim of this study was to examine the predictors of transfer of accent from the first language (L1) to a second language (L2) in a group of English as a foreign language (EFL) students whose native language was Persian and whose acquisition of English as an L2 had begun at ages ranging from 6 to 12+. In fact, the effect of age of L2 acquisition is very marked. If L2 acquisition had begun by 6, there is little transfer of accent. If L2 acquisition began after 12, there is invariably accent transfer, usually very marked. When accent transfer occurs between 7 and 11, it is usually very slight. These findings agree quite well with those of other studies, but there are discrepancies and these are indicated and discussed. Between 7 and 11, accent transfer may be affected by factors other than biological maturation. In my study, the only such factor to emerge strongly was whether L2 was used in the home, suggesting a shift of identification from the L1 to the L2 culture. This study also evaluated the critical period hypothesis (CPH) for second language (L2) acquisition.

Keywords accent, age, critical period hypothesis (CPH), first language (L1), L2 acquisition, second language (L2), transfer

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Introduction

When is the best age to learn a second language? What is considered “proficient” in a second language? What is the ultimate goal in acquiring a second language and how does this affect at what age it is taught? These are questions that are frequently asked when one considers learning a second language. The assumption that younger children can master the phonological system of a second language more easily than those who are older is not a new one. It has been assumed for many years that learning a second or foreign language at an early age is much more advantageous than learning it later in adulthood. Asking yourself, “When is the best age to learn a second language,” seems like a pretty straight-forward question. However, it is important to consider not only the available research, but also several other questions as well. Why is the individual learning the language in the first place? Does he/she wish to be proficient, or planning on dropping the language once certain “requirements” are met. What is the ultimate goal of learning the language?

It is commonly believed that children are better language learners than adults in the sense that young children typically can gain mastery of a second language, whereas adults cannot. This is reflected in what is known as the Critical Period Hypothesis (CPH) (Gass & Selinker, 2008). According to the Critical Period Hypothesis, which is usually associated with the name of Lenneberg, there is a biologically – or more specifically a neurologically – based period, ending around age of 12, at the onset of puberty, beyond which complete mastery of a second language is no longer possible. Lenneberg (1967) placed much emphasis on the relationship between language acquisition and the progressive specialization of the cerebral hemispheres from birth until puberty. During this period, the dominant hemisphere becomes more and more specialized for language until, at puberty, all language functions are concentrated in that part of the brain. Brown (2000) defines the CPH as “biologically determined period of life when language can be acquired more easily and beyond which time language is increasingly difficult to acquire.” Birdsong (1999) defines it as “the CPH states that there is a limited developmental period during which it is possible to acquire a language be it L1 or L2, to normal, native-like levels. Once this window of opportunity is passed, however, the ability to learn language declines.”

The question that is raised here is what do we exactly mean by ‘mastery’? Does it mean being good at all the four language skills? Or does it mean being like a native speaker of that second language? It is somehow concluded that the word ‘mastery’ is somewhat vague and abstract. The purpose of this study, however, is not to analyze L2 learners’ mastery of a second language but to see how age factor can affect foreign accent in an L2.

In another study by Dollmann et al. (2020), given the debates surrounding the CPH on L2 learning outcomes, the researchers focus on the phonological aspect of language acquisition, in particular on the strength of the foreign accent in L2. Their data were obtained from a large-scale representative data set on immigrant adolescents in Germany. The study suggests that there is a critical period up to the age of around 10, after which acquiring oral language skills without a foreign accent becomes less likely. The researchers also provide evidence that native-like language skills can be gained after the critical period provided that certain preconditions related to learning efficiency and language exposure are met. As a matter of fact, this study indicates that disadvantages caused by a late start in L2 acquisition can be made up of by higher cognitive abilities and exposure to a language environment with intensive and manifold contacts with native speakers.

Researchers have found evidence to support the CPH from studies done with kittens. Support for the CPH in first language acquisition was also found in studies done with deaf individuals. Research done involving the critical period with the visual systems on kittens shows support for a critical period. Kittens eyes were covered for a certain time during infancy and when the patches were taken off, the kittens were blind. The brain must be stimulated during a certain period of time when it is “receptive to new input,” known as plasticity, in order to aid in the development of correct functioning. This leads linguists to hypothesize a critical period for language acquisition. Research with deaf individuals supports the CPH. Some deaf individuals were not exposed to sign language until they were 5 or 6 years old and as adults, when compared to others who had learned sign language at an earlier age, these individuals had differing language abilities. But is there a critical period for second language acquisition? This is where we get some confusion over the Critical Period Hypothesis. We see that adults clearly can acquire a second language, but some research suggests a critical period for some areas of possible grammatical acquisition. While it is not impossible for adults to learn a second language, the critical period hypothesis suggests they may have increased difficulty learning compared to their younger counterparts. This may be due to brain lateralization at puberty and the loss of “plasticity” mentioned by Lenneberg (VanSickle & Ferris).

Literature Review

Compared to other studies, not much has been done in the realm of foreign accent and its relationship with age factors. A number of studies have investigated pronunciation inaccuracy in second language acquisition. Richard Suter (1976) wrote an article entitled 'Predictors of pronunciation accuracy in second language learning' (1976: 233-253). The article refers to research done first by Suter (1976) and later by Suter and Purcell (1980) on the importance of factors that might predict which students would achieve the most accurate pronunciation. Suter and Purcell made a list of twenty variables believed to have an influence on pronunciation. Among the items on the list were: mother tongue, sex, personality, attitude toward pronunciation, natural ability and conversation with natives. The conclusion of the research was that the most important variables responsible for mastering pronunciation in a foreign language, were, in order of importance, as follows:

1. Mother tongue
2. Attitude towards pronunciation
3. Conversation with native speakers
4. Natural ability to imitate foreign sounds, stress and intonation patterns

Another important conclusion they drew from their research was "that little relationship exists between teaching pronunciation in the classroom and attained proficiency in pronunciation; the strongest factors found to affect pronunciation (i.e. native language and motivation) seem to have little to do with classroom activity." (Purcell and Suter, 1980: 271-287). Moreover, "the attainment of accurate pronunciation in a second language is a matter substantially beyond the control of the educators".

The implication of this controversial conclusion is that teaching pronunciation in the classroom is actually a waste of time and that students will be able to develop pronunciation accuracy only if their mother tongue is close to the target language, they are pronunciation enthusiasts, and/or they are friends with natives.

A major problem on the students' part is the belief that they will not fail their exams only because they speak English with a Persian accent. In fact, they are quite right. The present examination system in English language institutes will, for example, quickly eliminate students who cannot distinguish future progressive from future perfect.

On the other hand, however, the very same system will turn a blind eye to problems such as the inability to distinguish between the sounds /ɪ/ and /i:/ or /θ/ and /t/ while saying words like *live*, *leave*, *three*, and *tree*. Making students believe it is worth working on their pronunciation requires a lot of diplomatic skills, both from the teachers as well as authors of pronunciation manuals. The job involves appealing to students' aspirations and ambitions. It also involves pointing out problems that might result if mispronunciation takes place. Among the most frequently quoted consequences of inadequate pronunciation are:

1. offence to the listener
2. misunderstanding by the listener
3. complete lack of comprehension by the listener
4. causing unintended laughter in formal situations
5. causing a political crisis

According to Olson and Samuels (1973), the theoretical support for notions regarding the relationship between age and foreign language acquisition comes from inferences drawn from psychological and physiological investigations. One example is the brain plasticity theory. According to this theory, younger children have a "cerebral receptivity" to language acquisition – in other words, due to differences in brain functioning, younger children find it easier to acquire a second/foreign language. As the child reaches puberty, their cerebral cortex organization becomes more specialized until speech is completely lateralized in the left cerebral hemisphere. Finally, as the organization of the brain becomes more specialized, the individual's capacity to learn a second/foreign language tends to decrease. In general, it is believed that language acquisition is more difficult once the brain is lateralized. It is also believed that the left hemisphere is more specialized for analytical, intellectual tasks, and the right for more emotional, social needs (Brown, 2000). Piske, MacKay, and Flege (2001) believe that age of L2 learning appears to be the most important predictor of degree of foreign accent. However, the relative importance of the other variables is uncertain. This is because many variables relating to subject characteristics tends to be confounded, and because of lack of adequate experimental control in some studies. In another study, Flege and Yeni-Komshian (1999) state, "The critical

period hypothesis rests on the assumption that the age-related effects seen in L2 studies are the result of maturational changes in brain structures that are used to learn and/or to process language. For example, it has been hypothesized that as the brain matures, it becomes less “plastic” and that lost neural plasticity impedes L2 learning” (e.g., Scovel, 1988; Patkowski, 1980, 1990).

Asher and Garcia (1969) argued that based on brain plasticity theory the young child’s brain has a cellular receptivity to language acquisition. This receptivity may be a function of cellular plasticity or elasticity which is controlled by a sort of biological clock. With age, the biological clock changes the cellular plasticity which reduces the organism’s capacity to learn language. Matsuoka and Smith (2008) found out that in terms of sensory acuity, children or younger learners are better in their ability to perceive and segment sounds in a second language. This leads to more native-like pronunciation among younger learners. Neurologically, loss of plasticity or lateralization and cerebral maturation, which occur at certain ages, have been proved to affect learners’ abilities to acquire both pronunciation and grammar. Certain ages are the cutting off points for the so-called ‘critical period’ or ‘sensitive period’. Therefore, neurological structure may affect both pronunciation and grammar. Regarding affective and motivational factors, child learners are, in general, more strongly motivated to communicate with native speakers and to integrate culturally because they are less conscious and suffer less from anxiety about communicating in a second language. In cognitive areas, children use their language acquisition device, while adult learners rely on inductive learning abilities in learning a second language. In the process of inputting the language information, children input it more efficiently than adults, who may utilize more negotiation of meaning. Lastly the difference exists in the means of storage. Young children store first language and second language information separately and become coordinate bilinguals whilst adult learners store first language and second language knowledge together and become compound bilinguals. Coordinate bilinguals can use both languages automatically whilst compound bilinguals cannot. Among the more recent literature, Birdsong (2006) summarizes the variables affecting the second language acquisition, including biographical variables such as the age of acquisition/arrival at which learners start to expose themselves to their second language, and endogenous variables such as motivation, aptitude and psycho-social integration with the second language culture. Birdsong (2006) also shows the function of age in actual behavioral data concerning both morphosyntax and phonology, which yields a strong negative correlation between the age of acquisition/arrival and the second language proficiency.

Fathman (1975) examined the relationship between certain aspects of the second language acquisition process and age. She stated, “there was some relationship between age and rate of learning. Among children exposed to English the same amounts of time, the older children scored higher on the morphology and syntax subtests, whereas the younger children received higher ratings in phonology.

There were, however, no major differences observed in the order in which children of different ages learned to produce the structures included in the test. These results suggest that there is a difference in the rate of learning of English morphology, syntax and phonology based upon differences in age, but that the order of acquisition in second language learning does not change with age.” Flege, Birdsong, Bialystok, Mack, Sung, and Tsukada (2006) evaluated the influence of age (adult vs. child) and length of residence in an L2-speaking country (3 vs. 5 years) on degree of foreign accent in a second language. Their findings were inconsistent with the hypothesis that adult-child differences in L2 speech learning are due to the passing of a critical period. They suggested that the milder foreign accents observed for children than adults are due, at least in part, to the greater L2 input typically received by immigrant children than adults.

On the other hand, Krashen, Long, and Scarcella’s (1979) findings claim to be counter to the hypothesis that there is a critical period for language acquisition. They found evidence for three generalizations concerning the relationship between age, rate, and eventual attainment in second language acquisition. The three generalizations are: “(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 faster than younger children (again, in early stages of morphological and syntactic development where time and exposure are held constant). (3) Acquirers who begin natural exposure to second languages during childhood generally achieve higher second language proficiency than those beginning as adults.” Contrary to this argument, Patkowski (1988) states, “Arguments raised against the Critical Period Hypothesis of second language learning are refuted. It is suggested both that sufficient research evidence exists to support the hypothesis and that the hypothesis was not represented accurately or contradicted convincingly in the criticisms.”

Birdsong and Vanhove (2016) argued that “learning of an L2 that begins in infancy is typically associated with fluent speech, effortless language processing, and native accent.” However, they claimed that late L2 learners “tend to diverge from monolingual natives on measures of grammatical and lexical knowledge, processing speed, and acoustic properties of speech.” In fact, they stated that there are different classes of explanations for age effects in L2 acquisition, namely “attitudinal, neurobiological, experiential, psychosocial, and cognitive.”

Perani et al. (1988) studied a group of Italian-English bilinguals who acquired L2 after the age of 10 years (high proficiency, late acquisition bilinguals) and a group of Spanish-Catalan bilinguals who acquired L2 before the age of 4 years (high proficiency, early acquisition bilinguals). The differing cortical responses they observed when low proficiency volunteers listened to stories in L1 and L2 were not found in either of the high proficiency groups. Several brain areas, similar to those observed for L1 in low proficiency bilinguals, were activated by L2. Their findings suggest that, at least for pairs of L1 and L2 languages that are fairly close, attained proficiency is more important than age of acquisition as a determinant of the cortical representation of L2.

Moyer (2007) presents new data on the degree of “foreign” accent among 50 immigrant learners of English in the USA as it correlates to learner orientation to the target language and target language culture. Correlation analyses verify the importance of age of onset and length of immersion as well as learners’ attitudes. The study concludes that language attitudes are significant for accent and that attitudes toward the target language itself are more powerfully linked to accent than are culture-directed attitudes; furthermore, the study indicates that a mixture of experience and a positive orientation appear to be particularly significant for attaining greater authenticity in accent.

Tahta, Wood, and Loewenthal (1981) examined predictors of transfer of accent from the first language (L1) to a second language (L2), in a group of people whose acquisition of English as an L2 had begun at ages ranging from 6 to 15+. They concluded that the effect of age of L2 acquisition is very marked. They stated, “If L2 acquisition had begun by 6, there is no transfer of accent. If L2 acquisition began after 12—13, there is invariably accent transfer, usually very marked. When accent transfer occurs between 7 and 11, it is usually very slight. Between 7 and 11, accent transfer may be affected by factors other than biological maturation. In our study, the only such factor to emerge strongly was whether L2 was used in the home, suggesting a shift of identification from the L1 to the L2 culture.”

Method

Two groups of subjects participated in this study. The first group consisted of 20 young adult and adult native speakers of Persian (mean age: 17.75) who were studying English as a foreign language at a language institute called the Iran Language Institute, 12 of whom had started studying English when they were in elementary school (between 9 and 11 years of age), 6 of whom when they were in junior high school (between 12 and 14 years of age) and 2 of whom when they were college students (after 18).

The second group also consisted of 20 young adult and adult native speakers of Persian (mean age: 18.8) who were studying English at the same institute, 14 of whom had started studying English before puberty (between 8 and 11 years of age), 4 of whom when they were between 12 and 14 years of age and 2 of whom after they had finished college. Both groups were in Advanced Levels (one in Advanced 1 and the other one in Advanced 2). Advanced Levels were divided into three levels, Advanced 1, 2, and 3. All the subjects were given questionnaires and were asked to answer all the questions accurately. Some feedback was also obtained from the teacher of each class. Since the focus of this study was the subjects’ foreign accent and pronunciation and the relationship between these and their age, the subjects were asked to read a few simple paragraphs in terms of vocabulary and they were also asked to read out the following five sentences:

- (1) *Math will finish his homework within an hour.*
- (2) *My brother Jonathan likes playing football.*
- (3) *My friend's apartment is absolutely gorgeous.*
- (4) *It's so sad we didn't get to see each other.*
- (5) *Look it up in your dictionary.*

The sentences, which varied in length from 9 to 12 syllables, were selected such that they contained phones that range from very similar to very different from Persian phones. For example, the vowel /ɪ/ (Sentence 1) is very similar to the Persian vowel with the same phonological features. The voiceless stops /b/ and /p/ and the fricative /f/ in Sentence 2 have the same place of articulation as their Persian counterparts. However, there is no initial

consonant cluster in Persian and this makes it somewhat difficult for native speakers of Persian to pronounce words such as *brother*, *playing* (Sentence 2) and *friend's* (Sentence 3) correctly. In fact, they may insert a vowel such as schwa / ə / between the first two consonants. The fricatives / θ / and / ð / and the glide / w / (Sentence 1) are examples of phones that do not exist in Persian phonemic system. Sentences 4 and 5 were selected as to measure the subjects' ability to make connected speech and join final consonant sounds at word endings to initial vowel sounds at word beginnings.

Results and Discussion

The students who had started studying English before the onset of puberty had a much better accent and accuracy of pronunciation than those who had started studying L2 at a later age. This corresponds with the CPH mentioned earlier. As stated earlier in this study, according to the Critical Period Hypothesis, there is a biologically – or more specifically a neurologically – based period, ending around age of 12, at the onset of puberty, beyond which complete mastery of a second language is no longer possible. Lenneberg (1967) placed much emphasis on the relationship between language acquisition and the progressive specialization of the cerebral hemispheres from birth until puberty.

Students whose ambition is to express themselves accurately as far as pronunciation is concerned should not take any wild guesses as to how to pronounce new words. Some degree of natural ability to imitate sounds as well as the knowledge of phonological rules and experience in using English definitely help but a pronunciation dictionary on the desk is by all means welcome.

This is especially essential when it comes to word stress. English stress is a rule-free realm where the ability to mimic and memorize stress patterns proves most helpful. Diacritics used in dictionaries to point out the stressed syllable inform the student to say this syllable louder than the others – a very simple task, indeed. Theoretically speaking, one might be able to notice the difference between stressed and unstressed syllables, but in practice there is a huge difference between knowing which syllable is to be stressed and actually stressing it.

It is an equally challenging task to help students sound English as far as intonation is concerned. Intonation is something children learn long before they are able to utter a single intelligible word. Intonation is a melody that helps us recognize what language is being spoken even when the speakers are standing too far away from us to understand what they are talking about. It is impossible to speak any language in the world without any intonation. What happens most frequently, however, is that irrespective of what language we speak, we tend to speak it using our native melody.

Developing a good stress and intonation memory is, with many students, a time-consuming process and it takes a lot of effort and perseverance before students manage to achieve full control over the volume of their voice and are able to turn it up or down as suggested by diacritics. It lasts a while, too, before the pitch patterns that the students use reflect the emotion they actually intend to express.

A responsible teacher should not neglect suprasegmentals assuming that they are learnable only by the more talented students who will adopt them themselves owing to their "musical ear". Stress and intonation deserve as much attention as other components of pronunciation practice.

Whether critical/sensitive period hypothesis exists, age should clearly be regarded as an important factor that influences the possibility of attaining native-like proficiency in a second language, though there are some differences in the learning difficulties involved because of the similarities and differences between the first languages and second languages and because of given contexts such as whether or not the learners reside in the countries where their second languages are spoken (Birdsong, 2007).

According to the Critical Period Hypothesis, complete mastery of an L2 is no longer possible if learning begins after the end of the putative critical period (CP). The first ability to be lost would be the one needed to develop a native-like pronunciation of an L2. Individuals who began learning an L2 before the end of the CP for speech learning would have a much better pronunciation than would individuals first exposed to the L2 after the end of the CP.

Conclusion

Summarizing potential problems, a Persian student has to face while trying to get hold of accurate English pronunciation, one might make the following list:

1. dependence on spelling
2. identifying target sounds with neighboring Persian sounds
3. mismanagement of English and Persian phonological rules
4. irregular word stress
5. applying appropriate intonation patterns
6. linking words

The problems listed above seem to be in mutual relationship with the pronunciation achievement predictors identified by Suter and Purcell, i.e. with motivation and natural ability. It would, without doubt, help achieving success tremendously if our students were properly motivated people with an aptitude for pronunciation higher than average. Still, if motivation to learn accurate pronunciation and the innate ability to imitate sounds, stress and intonation fail, the most likely result will be inaccurate pronunciation. This is a very general and imprecise statement since we cannot say anything about the expected degree of this inaccuracy. On the other hand, if the teacher and the students assume at the beginning of the language course that they may encounter problems during pronunciation classes, it would be most helpful to predict what kinds of problems are likely to occur. This, in turn, will allow them to focus their effort on the areas of pronunciation which require more attention than others and, thus, spend the class time more efficiently. The list of the six predictors of pronunciation inaccuracy shown above has been made in order to address potential problems of a Persian teacher teaching high school and college students and it is open to debate whether the list is complete or applicable in other teaching environments. The completion of the list, however, is not the point. It can be extended or shortened depending on the teaching context and the specific goals and expectations set by the learner and the teacher. The purpose of listing predictors of pronunciation inaccuracy is very simple: it serves to highlight potential difficulties and to involve the teacher and the students in a meaningful pronunciation practice.

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