EXPLANATIONS OF AGE DIFFERENCE IN FOREIGN ACCENT AND SOME IMPLICATIONS FOR TEACHING FOREIGN LANGUAGES

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摘 要

在習得及使用第二語時，幼童在語音上的表現多優於成人，外國口音往往出現於成人的第二語。本文主旨在於探討外國口音形成的原因及年齡不同所造成的差異。證據顯示腦部發展的生理因素不足以解釋外國口音的發生。〝語音翻譯假設〞和較早的〝對比分析假設〞也只能提供片面的解釋。我們認爲成人的語音能力不可因其母語及生理發展而加以設限；外國口音的形成乃基於學習環境、認知、社會、及情感多方面因素之綜合影響。我們以古生（Krashen）的〝監測模式〞（Monitor Model）所提出的理論架構，對這些綜合因素做出一個較完整的解說。基於以上的論說，本文最後對於外語教學提出數項建議。

Abstract

When acquiring and speaking a second language (L2), children often outperform adults in pronunciation, with adults' second language being more susceptible to the so-called "foreign accent". This article explores the several competing accounts of age difference in foreign accent. We challenge the longstanding "critical period" hypothesis, which imposes definite physiological, maturational constraints on L2 acquistion, and then deliberate Flege's "phonological translation" hypothesis along with the contractive analysis hypothesis, both of which attribute foreign accent to the negative linguistic interference of the first language (L1). We contend that, although physiological and linguistic factors do affect L2 performance, adults' ability, like children's, to acquire and speak an accent-free L2 should not be prejudged, that the presence of foreign accent in adulits' L2 may be largely due to a combination of environmental, cognitive, social and affective factors, and that Krashen's Monitor Model provides a comprehensive framework where these factors can be coherently related. Finally, in light of our deliberations, we consider some of their implications for teaching foreign languages.

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0. Introduction

Issues concerning language acquisition have interested and mystified lingusists and language teachers for centuries; however, it was only until the 1960's, after the advent of modern generative linguistics, proposed primarily by Chomsky (1957, 1965), when researchers began to analyze human languages systematically within a scientifically more rigid framework and to find out the developmental process of language acquisition. More specifically, within the domain of psycholinguistics, a newly-developed interdisciplinary field between generative linguistics and cognitive psychology, and the more practically-oriented field of TESOL (Teaching English to Speakers of Other Languages), there has also been considerable interest in the comparison of language acquisition between children and adults. This curiosity about the similarities and differences between the two is rather understandable, for it is experienced, or at least observed, by nearly everyone that the acquisition of one's first language is easy, often non-conscious, and without much effort, while that of a second or foreign language is usually a difficult task demanding hardship, especially within the context of formal instruction or as an adult. The difficulties of adult second language acquisition, especially in contrast with the ease of children's second language acquisition, indeed pose fascinating questions for research.

Such questions are, however, far too general for a short paper like this one to address them all. Rather, this paper is concerned with the acquisition of the phonology of a foreign language, or specifically that of a native accent. We first pose a very specific question: do children indeed do better than adults in acquiring the native accent of a second language? The answer may not be as straightforward as our common sense tells us, for some research results do seem to indicate otherwise, as we will see in later sections. Our answer to the above question is basically a positive one, although qualified in some ways; thus we need to provide an alternative interpretation to the research results that cast doubt on children's overall superior performance.

We set out to find explanations for this 'the-younger-the-better' age difference in terms of the acquisition of a second native accent. In particular, we will examine and evaluate the available approaches, from neurophysiological, linguistic, and socio-psychological perspectives. Are there indeed maturational constraints on language acquisition? How serious does the sound system of one's first language

interfere? And, in what ways do socio-psychological factors affect children and adults differently? We will endorse the socio-psychological account and reject the physiological and linguistic accounts. In light of the findings regarding these questions, we will then discuss some of the implications in teaching English or any other language as a second or foreign language and how various current teaching approaches accommodate these implications.

1. Age Difference and Types of Language Acquisition

Taking both age (children versus adult) and types of language acquisition (first versus second) into consideration, we derive a four-way distinction. The following figure is adopted from Brown (1980:44); note that the vertical shaded area is to indicate the transitional years from puberty to adulthood.

Type ↓ \ Age→	Child	/ / / / / /	Adult
First Language (L1)	C1	/ / /	A1
Second Language (L2)	C2	/ / /	A2

Fig. 1. A 4-way distinction of language acquisition

Cases of A1, adult first language, acquisition, though extremely rare for obvious reasons, do exist and have significant implications on the developmental process of language and also have suggested some new evidence for forming theories regarding language acquisition (Krashen 1973). Nonetheless, we will largely ignore the category of A1 here, since, as Brown (1980:45) aptly points out, 'it is not imperative at this time to deal with abnormal or pathological cases of language acquisition'.

Thus, among the remaining three varieties of lanuage acquisition: C1 (child first language), C2 (child second language), and A2 (adult second language), we obtain three pairs of comparison: a) C1-C2, b) C1-A2, and c) C2-A2. In dealing with the issue of age difference in foreign accent, we are certainly mostly concerned with the contrast between C2 and A2, and will refer to the comparisons of C1-C2 and C1-A2 only when they are relevant to our discussion.

2. Physiological and Maturational Constraints

By far the most accepted and prevalent attempt to explain the different degrees of foreign accent in C2 and A2 is the so-called "critical period" hypothesis, which suggests the existence of a sensitive period of the acquisition of a non-native phonological system (Oyama 1976). Such a hypothesis came from clinical evidence of physiological studies and dates back to 1966 when Penfield and Roberts found that children can recover completely from injury of the speech area in the dominant cerebral hemisphere by the shifting of speech area from the left to the right hemispheres. Moreover, this shift was clearly demonstrated with a temporary aphasia, created artificially by an injection of sodium amytal into the carotid artery (Olson and Samuels 1973). Lenneberg (1967) in his noted book on the biological foundations of language presented similar evidence from case studies of aphasia. These had led to the 'critical period' hypothesis in first language acquisition, which asserts that there is a physiologically determined period after birth when primary language can be acquired easily and perfectly, but once beyond this 'critical period' first as well as second language acquisition becomes increasingly difficult.

Furthermore, it has been commonly suggested that the 'critical period' coincides with the completion of cerebral dominance, or the lateralization of the functions of the brain's two hemispheres. In other words, the 'critical period' ends when the maturational process of the specific functions of cerebral dominance becomes static. Linguistic, along with reasoning and logic functions are, in the majority of mature adults, located in the left hemisphere, although exceptions are not uncommon. Lenneberg submitted that the slow process of lateralization occurs between age two and ten and completes itself around the age of twelve and further proposed that the cerebral plasticity is a significant factor in acquiring a second language. The appearance of foreign accent, therefore, is listed as one of the characteristics of linguistic behavior between age twelve and fourteen (Lenneberg 1967:181). Scovel (1969:181) extended the 'critical period' effect to account for the persistent presence of foreign accent in the speech of post-pubescent second language learners:

> . . . the ability to master a language without a foreign accent before the age of about twelve is directly related to the fact that lateralization has not yet become permanent; similarly, it seems apparent that the

> inability for adults to master a language without a foreign accent after the age of about twelve is directly related to the fact that lateralization has become permanent. (Scovel 1969:181)

In a more recent research, Sussman (1982) used the dichotic test to find out how the first and second languages are located in the brain. The results indicate that both the first and second languages are located in the left hemisphere if the subject had become bilingual at a rather young age, and yet for those who acquired the second language at an older age, while the first language is located in the left hemisphere, the second language is symmetrically located in both hemispheres. This study clearly demonstrates that young children process and thus acquire a second language in very similar ways as they do their first language, while adults do not; nonetheless, it does not support the 'critical period' account of age difference in foreign accent at all, since it provides no link whatsoever between the way the second language is processed and the presence or absence of foreign accent.

The 'critical period' account of age difference in foreign accent, such as the one conceived by Scovel (1969), is not as convincing as it first appears once we realize that it has only marginal experimental basis and is not based on direct experimental data. Moreover, all Lenneberg's evidence suggests only that a critical period may exist for first language acquisition and does not have a direct bearing on second language acquisition. More recent research by Krashen (1973) has produced new evidence indicating that the cerebral lateralization is completed by the age of five; see Dulay, Burt, and Krashen (1982:87-90) for a fairly comprehensive listing of subsequent researches supporting this position. Beyond this age total damage of the speech area in the dominant hemisphere is highly unlikely to recover completely. This seriously contradicts Scovel's claim, since lateralization is completed much earlier than puberty and it is hardly uncommon for children between age five and puberty to acquire a second language free of any foreign accent. Furthermore, based upon researches on hemispheric asymmetry in infants, Kinsbourne (1975) proposed that there is no development of lateralization at all and that cerebral dominance is the original state of the brain. If this proves to be true, then the 'critical period' hypothesis would lose its grounds altogether.

Perhaps the most critical counter-evidence to the 'critical period' account

of foreign accent is the fact that adults, not necessarily in small numbers, do acquire a second language with a native accent; evidently, some even achieved this in the naturalistic settings without any formal instruction (Hill 1970), a fact confirmed by Neufeld (1980):

> Even in the area of articulatory performance, further study may show adults to be capable of native-like or accent-free speech in L2. As demonstrated in the 1979 study, some older learners do attain a native-like command of phonological rules, prosodic features and articulatory skills in their second language.

Another types of counter-evidence comes from studies which show that adults may perform as well as children or even outperform them in terms of the pronunciation in a second language. It is a rather widespread notion that children learn to speak a second language fluently with a native or near-native accent, while it seems extremely difficult, and thus rare, for adults to be speaking a second language without a foreign accent under the influence of their native language. Such a belief has been so universally held that it has prompted Scovel to give this imaginary case:

> . . . if Professor Irwin Corey, Idianologist and phonetician at a large Mideastern university, moves to New Delhi for a year's sabbatical, he will discover, much to his chagrin, that his young, six-year-old son, William Jones Corey, will be able to speak Hindi with the fluency of an Indian schoolboy. Professor's Corey's Hindi, on the other hand, usually elicits the response, "You speak excellent Hindi ..... for an American!" It does not seem to matter very much that our Professor Corey has published a Hindi-English Dictionary, a transformational grammar of Hindi, which, incidentally, received excellent reviews, and has taught phonetics and phonemics for many years. (Scovel 1969:245-246)

As it is not uncommon in sciences to challenge even the most generally-held beliefs or assumptions, Scovel's imaginary case and the common notion behind it have indeed been challenged by some research findings. Findings of two types of studies are available; those done in laboratories where the subjects' exposure to the foreign language is highly controlled, on the one hand, and those on

naturalistic second language acquisition, on the other hand. The troubling fact is that some, certainly not all, of the studies seem to indicate that adults perform as well as, or in some cases even better than, children in terms of pronunciation. For instance, none of the seventy-one Cuban immigrants of Asher and Garcia's (1969) study, no matter at what age they arrived in the United States, had acquired the native accent of American English, judged by naive native speakers of the language, and only those immigrants who arrived in the U.S. at the age of six or younger and had since stayed in the country for five years or longer were judged as having a 'native-like' accent.

Another study of children second language acquisition done by Snow and Huefuagel-Hohle (1977) also confirms Asher and Garcia's finding. Forty-seven native English speakers from various countries were tested for their Dutch accent while living in the Netherlands and learning the language. The subjects were divided into five age groups: 3-5, 6-7, 8-10, 12-15, and 15-60, and the experiment was factored into three phases: 1) at the beginning of learning Dutch, 2) by the 4-5th month after starting, and 3) by the 10-11th month. At the beginning, the older subjects had an advantage in pronunciation; however, at the second phase age difference in pronunciation disappeared. At the third phase, the younger groups performed better than the older ones only in pronouncing certain sounds; otherwise, still no significant overal age difference was found; moveover, unlike Scovel's imaginary young William Jones Corey who speaks Hindi natively after an one-year stay in India, none of the forty-seven children in the study achieved a native Dutch accent within that time frame. What is also worth mentioning is that eighteen months later eleven of the children were available and tested again — only one teenager had acquired a native Dutch accent.

Nevertheless, research findings consistent with the-younger-the-better age difference in second language accent are also readily available. As cited in Oyama (1976), Krashen examined as many as four hundred second language learners in two countries as an informal study and found that subjects who started learning the second language before age eleven rarely had a foreign accent. For those who started at age eleven to fifteen, foreign accent was not uncommon, and none of the group who started after age fifteen had achieved a native accent; in other words, a foreign accent was without exception. In a formal study done by Oyama (1976), sixteen male Italian immigrants in the U.S. were studied and

the results precisely confirm that the age of the immigrants at arrival is a strong, if not definite, indicator of the degree of an Italian accent in speaking English; the length of stay in the U.S. since arrival, however, seems to have very limited effect in terms of accent.

Incidentally, faced with these conflicting research results, one has to wonder if some of the variation might not arise from reliability problems in judging accuracy of accent or pronunciation. Indeed, we need to beware of the possible variation *between* one study and other — with different sets of judges — in what is being labeled as 'native', 'native-like', 'near-native', 'foreign', etc. These are rather vague and ill-defined terms. Since to date, there has not been any instrument that can judge accent as well as the native speakers, in all studies cited above, native speakers, linguistically sophisticated as well as naive, served as judges. Thus, we can assume reliable judgements *within* any one study, or to put it more accurately, we may assume reliable judgements by the same judge or judges that one age group wound up with a better (more native) or worse (more foreign) accent than another age group.

So far we have seen some of the inconsistent results of researches on age difference in foreign accent using subjects acquiring the second language in naturalistic settings. Similarly, researches studying L2 learners receiving formal instructions who also show the same kind of inconsistency. Fathman (1975), having examined two hundred ESL children, concluded that in the respect of phonology the younger group (six to ten) had an advantage, while the older group (11-15) performed better in morphology and syntax. Incidentally, in terms of the acquisition of syntax and mophology, research results are much more consistent: the older, the better (e.g., Ervin-Tripp 1974, Asher and Price 1967, Asher 1969). Olson and Samuels (1973) also confirmed the superiority of younger children over the older ones in learning foreign pronunciation and intonation, citing informal observations of a number of FLES (Foreign Languages in the Elementary School) programs.

Conflicting results, however, also abound. Politzer and Weiss (1969) conducted a study of some lst, 3rd, 5th, 7th, and 9th graders who had no prior exposure to French. After a few weeks of formal instruction where the subjects were given model pronunciation, required to imitate, and shown pictures with vocabulary, they were tested in the following three areas of language abilities: 1) auditory discrimination, 2) pronunciation (in echo response), and 3) recall of vocabulary. The test results indicate consistently that the means from a higher

grade is better than that of a lower grade in each of the three areas.

Olson and Samuels (1973) had similar results from their experiment. Three groups of students, with twenty each, from elementary school, junior high school, and college were taught thirty-three German sounds with various types of mimicry drills, and the subjects were pre-tested and post-tested. On the pre-test, no difference in pronunciation was shown by the analysis of variance and co-variance; on the post-test, however, the older two groups were found to be significantly better ($p > .01$) than the elementary group in pronunciation. Snow and Huefuagel-Hohle (1977) studied one hundred and thirty-six British English speakers aged from five to thirty-one in a controlled laboratory on their Dutch pronunciation. When the subjects were divided into eleven age groups, the results show that the pattern of increased proficiency was not very regular, though the youngest two groups scored the lowst, and the oldest highest. Yet, when the subjects were divided into five age groups (5-7, 8-10, 11-13, 15, 17-31), the linear increase became significant ($p > .05$).

Based on the conflicting evidence, Snow and Huefuagel-Hohle (1977:365) contend, rather reasonably, that 'the short-term superiority of older speakers, both in a laboratory and in a naturalistic learning situation, is a strong evidence that a critical period for second language acquisition cannot provide the explanation'. Considering evidence on both sides of the issue, indeed we need to seriously reconsider the explanatory adequacy of the 'critical period' hypothesis in terms of age difference in foreign accent. Lenneberg's biological constraints may be more significant in first language acquisition than in seond language acquisition. Moreover, there do exist a few rare cases of A1 acquisition, such as the case of Genie, who was socially isolated and inhumanely prohibited to utter any sound, and was rescued and started to acquire her first language at the age of thirteen and a half; thus, although Genie's English did not reach a full native capacity, her encouraging progress and surprising improvement not only indicate the possibility of first language acquisition after puberty but also that adults' ability in a second language should not be prejudged in physiological terms (Krashen 1973).

Nonetheless, while we should look for more plausible explanations in other areas for age difference in foreign accent, it would be unwise to eradicate the relationships between adults' difficulties with foreign pronunciation and neurophysiological maturation, as Schumann (1975) has cautioned. Certainly sound

patterns are produced by actual motor activities directly initiated and controlled by neurophysiological mechanisms. In comparison, other linguistic patterns, e.g., lexical, syntactic, and semantic, have far less, if at all, such 'neurophysiological reality' (Scovel 1967).

In addition, we further voice caution in interpreting the research findings that show older learners to be better in pronunciation than younger children under formal instruction, such as Politzer and Weiss (1969), Olson and Samuels (1973), and Snow and Huefuagel (1977), among others. It is rather imprudent to draw a hasty conclusion such as the one made by Olson and Samuels (1973):

> The general assumption is that younger children learn to produce foreign words with a more native-like accent than older people. Not only is this assumption not supported by the test, but the trend is in a reverse direction favoring older people.

Similarly, Genessee (1977:150), citing several such studies indicating older learners' superiority in overall performance in formal instruction, concludes:

> there is a rather noteworthy consensus among these studies concerning the learning rates of students at different ages--older students seem to be more efficient learners than younger students. That is to say, given the same amount of instruction, or even less, adolescents will learn as much or more than younger children.

Such a conclusion is far too general than these tests truly suggest, however. First of all, in all the studies mentioned above, the somewhat formal testing environment was artificially set up and thus would tend to be more unfamiliar and intimidating to younger children, who are socially less sophisticated than older people. In other words, the testing environment may pose a social bias unfavoring the younger subjects. There are other more serious considerations regarding those studies done in laboratories, where the subjects were exposed to the second language via formal instruction, most often in a passive, static, and non-playful manner, and the language material was usually merely pieces of the language, such as minimal pairs of words, singled-out isolated words, and some short sentences only occasionally. The subjects were not in any sense exposed to authentic speech; no attempt was made to simulate a more naturalistic or realistic discourse, nor was the student allowed any opportunity

to relate what they were learning to a functional communicative interaction. It is therefore reasonable to assume that while 'learning' was possible, naturalistic 'acquisition' was not likely. Furthermore, across these controlled experiments, subjects were taught within an audio-lingual paradigm with techniques such as model demonstration, imitation, and repetition. Thus, the poorer performance of the younger children may simply be an indication of the ineffectiveness of such a method with younger children. Finally, it is also crucial to note that all these experiments were rather short-term and dealt with the beginning phase of second language learning.

Therefore, findings from these studies may simply indicate that, at the initial contact with a second language in a situation of formal instructions, the older learners may have an advantage over their younger counterparts in consciously 'learning', or more accurately 'demonstrating', their proficiency of pronunciation. From a pedagogical point of view, they may also indicate that the audio-lingual method, which stresses upon the learner's conscious learning may be very ineffective for children. Thus, such studies do not address the issue of age *perse* for the age factor overlaps with the program factor (cf. d'Anglejan 1990:153). Taylor (1974) also points out that the older learners have a cognitive superiority in conscious learning, although he is much mistaken in seeing L2 acquisition as a cognitively conscious task. Therefore, the cognitive differences between children and adults may account for older learners' initial advantages in rate of learning, and ironically this cognitive advantage may also turn out to account, at least partially, why eventually childrn outperform adults in acquiring a native-like L2 accent. Later in the discussion of Krashen's Monitor Model, the role of cognitive differences will become more clear.

To summarize, these findings do not conclusively contradict the well-established observation that children, under proper conditions, do acquire a second language easily with a native accent. Children may be able to acquire a second language as an integrated system more thoroughly than adults, but not more quickly in a piecemeal fashion. Finally, to reiterate our position regarding the 'critical period' account of the issue of foreign accent, although we have called for more prudent interpretation on research results indicating adults' advantage over children in certain pronunciation tasks, we contend that there is enough evidence to show that adults' ability to speak an accent-free second language is not constrained definitely and that the 'critical period' account of biological or

maturational constraints is inadequate; hence, we should search for more plausible explanations in other domains.

3. Phonological Interference of L1 in L2

It is well-established and well-accepted by now that young children process a second language in ways different from adults, who tend to process linguistic input in terms of what they already know (Sussman 1982). James Flege (1981), rejecting the 'critical period' hypothesis, proposed a 'phonological translation' hypothesis to account for adults' foreign accent, which states that the most crucial factor creating age difference in foreign language pronunciation exists in the phonologal development. That is, while the young child learns the two phonological systems of L1 and L2 simultaneously, the older learner begins to learn the L2 sound patterns after the firm establishment of the first system and has a strong tendency to interpret foreign sounds in terms of their native phonological system. Indeed, available empirical data show that substantial phonological errors in L2 children make are similar to those made by children learning the language as L1 and thus suggest that there may be a natural process of phonological acquisition (Dulay, Burt, and Krashen 1982:97-98, 112), confirming the natural phonology of Stampe (1973). Many adults, on the other hand, process the L2 sound system through their L1 system throughout their lives and this phonological translation of L2 sounds is said to be the cause of foreign accent, although the adult speaker's control of the second language may be native or native-like in other respects.

Although Flege's proposal was intended as an alternative to the 'critical period' hypothesis, it turns out that this 'phonological translation' hypothesis is entirely compatible with a maturational account: a young pre-critical-period child can internalize two (or more) phonological systems as two separate parallel systems; but later, as the critical period wanes and the brain changes state, the native system becomes 'set', or lateralized, all subsequently-learned systems will be interpreted in terms of this 'set' first one. Therefore, in order for Flege's hypothesis to make sense, there has to be evidence showing a direct relation between the 'phonological translation' and adults' difficulties in adjusting to foreign sounds neurophysiologically. As mentioned before, other aspects of language such as morphology and syntax may have little to do with such neurophysiological mechanisms; nonetheless, grammatical interference is also typical of A2. But, to the best of my knowledge, there is

no evidence indicating a direct link between the reality that adults'L2 is located in both hemispheres of the brain (see Sussman 1982) or that adults may process a L2 in terms of their L1 and the difficulties in producing accent-free foreign sounds. There seems to be an unsubstantiated assumption that equates the different ways adults linguistically process a L2 from children with the more prevalent presence of foreign accent in adults' L2.

Similar with Flege's 'phonological translation' hypothesis, which sees a negative role of L1 in A2, the contrastive analysis hypothesis, deeply rooted in behaviorist (stimulus-response) psychology and structuralist linguistics, offers a more comprehensive explanation as to the overall interference of L1 in L2: the essential difficulties of L2 acquisition arise from the set habits of L1 (e.g., Lado 1957, Fries 1957). Foreign accent, along with other kinds of defects in L2, are due to the interference of L1; thus, it follows that a careful linguistic comparison of the learner's L1 and L2 — contrastive analysis — will reveal and predict the learner's errors and likely lapses. Although the contrastive analysis hypothesis was once seen as mildly successful in the phonological component, the behaviorist rationale has been severely discredited (e.g., Chomsky 1959 and R. Brown 1973) and empirical data used for its support has also been shown to be inapplicable to the issue of L1 interference in L2 (Dulay, burt, and Krashen 1982); furthermore, the majority of the predictions, especially non-phonological ones, made according to contrastive analyses have been proven inconsistent with research findings on L2 errors and difficulties (e.g., H. Brown 1980:157-158 and Dulay, Burt, and Krashen 1982:103).

Above criticisms notwithstanding, it would be impossible to ignore the phonological effect of L1 in the foreign accent of L2, particularly for adults. A simple fact is that native Japanese speakers do not speak English as a second language with an Indian, German, or Arabic accent, and vice versa; and furthermore, various accents are not only identifiable but also imitable to many non-linguists. Indeed, it seems "self-evident" that there is a substratum of the L1 sound patterns in the phonology of the speakers' accented L2. Yet, as mentioned before, the internal dynamics underlying the localization of L1 effect is still not clear. A more important question for us to ask is: under what circumstances such a phonological substratum of L1 may have serious adverse effect over L2 pronunciation and results in a detectable foreign accent.? After all, as we have seen in the previous section, some adults do acquire L2 successfully without

a foreign accent and under certain conditions older learners even outperform younger ones in pronuciation. In the next section we will explore the influence of environmental factors, social roles that language and accent play, and the role affective factors play in L2 acquisition.

4. Social, Affective and Environmental Factors in Language Acquisition

Languages, dialects, the use of a particular style of speech, and indeed diverse accents serve various social functions. Accordingly, it has been suggested that there may be social motivations for L2 speakers to develop and maintain a foreign accent, such as to distinguish membership in a certain social or racial group, and also that there is a correlation between age and the degree of self-consciousness, that is, the older, the more self -conscious, and thus the less able to identify with the host L2 group and the less likely to reach the optimal open mental state for subconscious acquistion to happen (Dulay, Burt, and Krashen 1982:92-93, 112). Magiste (1987:56) also attributes younger learners' advantage to their greater spontaneity and flexibility and with increasing age the older students become more conscious and reserved, which makes L2 acquisition more difficult. Schumann (1975) constitutes a review of relevant studies, concluding that such affective factors contribute to the heightened degree of affective filtering in adult L2 acquisition, which impedes thorough and comprehensive acquisition. Foreign accents, within such an account, is the result of an elevated degree of affective filtering in L2 acquisition, and age difference is thus due to younger learners' lower amount of affective filtering than the older learners.

Another factor worth considering is concerning the different environments where L2 learners of different ages are likely to be exposed to. Dulay, Burt, and Krashen (1982:119) proposed that learners will fall back on their L1 if they are compelled to produce the L2 before the L2 is sufficiency acquired and ready to be used. We surmise that, compared with younger children, older learners are universally much more frequently subject to environmental conditions, such as pressure to perform or lack of adequate natural L2 exposure and input, which demand premature oral production of L2 and thus foster the interference of L1 phonology, or 'phonological translation' to use Flege's term. In other words, the environments for older learners force premature L2 pronunciation based on conscious learning through the substratum of L1 phonology, and the long term effect of such acquisition-

impoverished environmental conditions result in the 'fossilization' of the imperfect L2 sound system. Selinker and Lamendella (1980) define 'fossilization' as a cessation of further systematic development in the learners' still deficient L2. In this way, we see the persisted appearance of a foreign accent in one's L2 as the direct consequence of the fossilization of the L2 phonology. As cited in Ellis (1990:52), Selinker and Lamendella (1978) proposed that this fossilization may be because there is no communicative need for further development. This lends further plausibility to our 'fossilization' hypothesis, since indeed an accent, in most cases, do not impede oral communication, the most important function of language, while an impoverished lexicon and faulty syntactic structures do. However, Selinker and Lamendella (1978) also proposed that an alternative explanation to fossilization is that an accent-free competence may be neurolinguistically impossible for most learners, and Selinker and Lamendella (1980:135) went as far as citing and endorsing the following argument of Scovel's (1977:39), a strong advocate of the 'critical period' hypothesis.

> . . . the basic problem with environmental explanation is that they do not account for the fact that the very best adult learners exhibit few, if any, syntactic erros, while no adult learners, even the very best, escape without an accent. In other words, why do sociocultural or psychological variables intervene at the phonological level but not at the level of syntax, which, in terms of linguistic theory, is much more complex and abstract? For this reason, we must abandon explanations founded on nurture and look to those grounded on nature. (Scovel 1977:39)

Scovel's point that phonology has more a physiological basis than syntax is well-taken; however, the entire language faculty must, at some level, be physiological. None of the proponents of non-physiological accounts of foreign accent would deny it, as it poses no conflict. The problem is that, other than this one valid point, Scovel's arguments are unfortunately based on several misunderstandings, and thus logically his conclusion is entirely unacceptable. First of all, no linguistic theory, to my knowledge, poses a complexity measure that would give a comparison of syntax and phonology, and more importantly, permanent fossilization of deficient morphological and syntactic structures in adult L2 are hardly unusual. The thousands of pidgin speakers alone are enough evidence. In fact, Schumann (1976) proposed that the adult L2 acquisition process has much in common with that of pidginization. Like pidginization, fossilization of deficient L2 is not at all unique of phonology. Furthermore, perhaps to Scovel's chagrin, it is precisely social and cultural factors

to which Schumann (1976, 1978) attributes the occurrence of pidginization of a deficient L2.

Secondly, the stereotyping of adult L2 oral performance as universally accented is indeed a tired one by now and has been disputed--some adults *do* succeed in acquiring an accent-free L2, as the several studies we have cited earlier indicate. Hill (1970:247-248) offered the following caution to this ethnocentric stereotype:

> The language acquisition situation seen in adult language learners in the largely monolingual American English middle class speech communities . . . may have been inappropriately taken to be a universal situation in proposing an innatist explanation for adult foreign accents. Multilingual speech communities of various types deserve careful study ... We will have to explore the influence of social and cultural roles which language and phonation play, and the role which attitudes about language play, as an alternative or a supplement to the cerebral dominance theory as an explanation of adult foreign accents.

And, finally, there indeed is a motivation, a communicative one, that distinguishes a phonological defect like accents from other types of grammatical defects such as an impoverished lexicon or syntactic errors. It is rather curious that Selinker and Lamendella (1978), who proposed that fossilization may be due to the lack of communicative need for further development, did not see it as an argument against Scovel's contention. As we have indicated already, foreign accents do not in most cases hinder oral communication, and even when they do the effect is far less serious than an impoverished lexicon or inappropriate syntactic structures would.

5. The Monitor Model: A More Comprehensive Framework

One thing that is clear from our discussion above is that the issue of age difference in accent is still not well understood in that each of the explanations discussed thus far focuses on a particular aspect of L2 acquisition and none by itself can sufficiently account for age difference in foreign accent. It appears that such interacting domains are required to explain the present somewhat confusing variation in research findings--studies perhaps have just not held all variables constant. Therefore, a more

complete understanding may depend on a combination of explanations put forth from several perspectives. Krashen's Monitor Model seems to offer a fairly comprehensive framework where the several aspects of age difference in foreign accent can be related to one another in a coherent manner. Krashen links five hypotheses for L2 acquisition to form the Monitor Model (Krashen 1980, 1985):

1. The Acquisition-Learning Hypothesis
2. The Natural Sequence Hypothesis
3. The Monitor Hypothesis
4. The Comprehensive Input Hypothesis
5. The Affective Filter Hypothesis

Now we can reiterate and relate our positions in the previous sections within this framework. The cognitive factor of age difference can be made more clear in the acquisition-versus-learning paradigm. While 'learning' is the conscious process by which linguistic knowledge is attained, 'acquisition' is the subconscious process by which linguistic competence is developed; furthermore, consciously 'learnt' knowledge cannot be transformed to 'acquired' competence. Older learners, cognitively more developed, are superior in learning and thus, as indicated earlier, often outperform younger learners at the initial stage or under formal instructions; nevertheless, the older learners' dependence on the cognitive advantage in conscious learning reduces subconscious 'acquisition' of the L2 native sounds and thus in the long term may result in a foreign accent.

The Natural Order Hypothesis conjectures that grammatical features in a L2 are acquired in a universal predictable 'natural' order. Though this hypothesis is primarily concerned with morphological and syntactic structures, there is also considerable evidence suggesting a natural process of phonological acquisition by children (Dulay, Burt, and Krashen 1982:97-98, 112), confirming the natural phonology of Stampe (1973). However, unlike the natural order of grammatical structures, which are universal for all L2 learners, this 'natural' order of phonological features is only found in young children's L2 acquisition, but not found in adults'. This, in turn, indicates another area of child-adult difference in accent. More specifically, it provides a basis for the fact that children acquire the L2 phonology as an entirely separate system, while adults tend to have their L1 phonology as a substratum of the L2 system. Although the localization of the L1 substratum and its direct neurophysiological effects are still not well understood, it is self-evident

that one of the end products is foreign accent.

The Monitor Hypothesis accounts for the variation of a L2 learners' performance: 'learnt' knowledge can operate to 'edit' or 'monitor' utterances generated via 'acquired' competence, given enough time and the conscious alertness of the L2 user. Thus, monitoring may occur before or after the actual output. Since monitoring is based on the consciously 'learnt' knowledge and adults rely more heavily on conscious learnings, there should be more monitoring in adult L2 speech. Although most observational and anecdotal, adults' L2 speech do fluctuate more in terms of accent than children's. This can be accounted for by the more intense monitoring in adults' L2 speech; in contrast, children's use of monitor is far less because their speech is largely generated by the acquired competence and there is little 'learnt' knowledge to be used as monitor.

The Input Hypothesis suggests that 'acquisition' is the result of comprehensible input and not of production. In the literature some researches indicate that the difference in the kind of L2 input may be another source of the child-adult difference in L2 performance. Children seem to receive much more simplified and concrete 'here-and-now' input, which is believed to better facilitate language acquisition than the more 'topic-centered' material adult learners are typically exposed to (Dulay, Burt, and Krashen 1982:93-95). Although simplified input does not always constitute comprehensible input and vice versa, which is necessary for language acquisition (see Eills 1990:99-107 for a more detailed discussion), a 'here-and-now' input is more easily made comprehensible by its immediacy and by its context than 'topic-centered' language. Thus, children are more likely than adults to be exposed to the type of comprehensible L2 input facilitating acquisition. Furthermore, while comprehension has positive effects for acquisition, production does not; premature or forced oral production even has the adverse effect of fossilization of L1-influenced accent. Older learners are universally much more frequently exposed to environmental conditions that involve premature oral production of L2. When compelled to produce in an L2 before they are ready, learners fall back on their L1 and this induces the interference of L1 phonology and, in the long term, results in a foreign accent.

The Affective Filter is essential for L2 acquisition in that it controls the ultimate level of success. A low affective filter, which sanctions input to become 'intake', or acquired competence, is necessary for an overall success in L2

acquisition, and thus a native accent. Children's higher degree of openness, lack of anxiety and self-identity, and lower level of self-consciousness allow them a low affective filter in L2 learning and ultimately makes it possible for their L2 speech to be free of foreign accents. Adults, being more self-sonscious and reserved, are likely to maintain a high affective filter resulting in foreign accents.

To summarize, we attribute age difference in foreign accent to a possible combination of several factors. A typical profile of an older L2 learner susceptible to a foreign accent includes a better cognitive ability for conscious learning, a tendency to process foreign sounds in terms of his or her L1 phonology, a more intense use of monitoring, poorer exposure to comprehensible input with more frequent production before ready, and a high affective filtering, while a child learner's profile is quite the opposite. The typical adult and the typical child thus form a continuum which allows a gret degree of individual variations in terms of accent.

6. Some Implications for Teaching Second Languages

We have examined the issue of age difference in L2 foreign accent from several perspectives and related them in a coherent framwwork, the Monitor Model. By and large, there is enough evidence to reject the biological account, which is based on two conjectures, with the second logically dependent on the first: 1) the structure of adult brain is fundamentally different from that of child brain, and 2) adult's L2 foreign accent is a direct consequence of this difference. Both, especially the first, have been seriously challenged, as we have done here in this article. Considering the implications of this 'critical period' hypothesis of L2 acquisition, Scovel (1969), however, possed a most appropriate question:

> . . . to what extent are we as teachers of English as a second language trying to rid our student of a foreign accent? If what I have suggested is true, our efforts towards this end are as futile as Professor Corey's attempts to be a native speaker of Hindi.

The plenty of evidence for successful subconscious acquisition by adults and the demonstration that cerebral dominance (lateralization) does not pose a strict barrier to a native-like L2 accent, should encourage foreign language teachers as well as

students, and yes, even Scovel's fictitious Professor Corey, to pursue an accent-free L2. Here we should discuss how such efforts will be best rewarded. The child learner free of accents, also an ideal learner we are trying to simulate, is one who relies little on conscious learning, processes the foreign sound systems independently from his or her L1 phonology, uses little monitoring, enjoys a great quantity of comprehensible input and never feels compelled to speak, and has a low affective filtering. Since we already know that children L2 learners more often than not achieve a L2 with a native-like accent, it would be sensible to try to simulate the linguistic, environmental, and psychological settings where such an achievement is known to be possible. Therefore, a good approach of teaching foreign languages should accommodate such conditions and create a learning environment accordingly to promote acquisition.

We will give a few suggestions based on the above implications. To reduce conscious learning, the teacher should avoid explicit explanations, rather, extensive examples can be used to induce students' subconscious learning. Although the use of L1 is still controversial, in my opinion, the use of the learners' L1 should definitely be avoided to circumvent the students' dependence on their L1 and thus reduce the possibility or the degree of interference — the little utilitarian and emotional value of the limited use of L1 is not worth the risk of fossilization. Input to which the students are exposed should be carefully designed and monitored to make sure that they are comprehensible from the context and thus just one level higher than students' level of proficiency, since incomprehensible input is merely a waste of time and comprehension is the key to successful acquisition. Students should never be made feel compelled or required to speak to avoid fossilization. The total learing environment should reduce thae students' anxiety regarding the second language and foster the open, spontaneous, flexible, and non-imposing state of mind of the individual student as well as the students in the same class as a group.

A number of current approaches have made attempts to achieve this type of nonthreatening environments. The Total Physical Response attempts to simulate this ideal child learning environment by using dynamic, playful, and physical activities where students comprehend and respond physically and are not required to speak at the beginning phase (Asher 1967, 1972). Her (1983) extends the notion of delayed oral practice in his Active Listening Method to maximize comprehension and to avoid forced speech. To further reduce affective filtering, several responding modes are introduced: physical, pictorial, and graphic. In Suggestopedia (Lozanov

1982), to remove the possible negative feelings, an extremely comfortable and relaxing learning environment is provided. Once the learners' affective barriers are circumvented, they can achieve the childlike state of plasticity, openness, and creativity. The teacher's work then is to help the students to de-suggest their subconscious limitations due to earlier suggestive influence and replace them with new positive ones. In the most unique Silent Way approach, students' wholesome attitudes are stressed upon. However, since peerlearning is one of its characteristics and language learning is considered as problem-solving by using resources within oneself and his peers, the teacher leads the class silently except to provide the model (Stevick 1980:51, 1976:136-137). The silence on the part of the teacher within the Silent Way, however, is contradictory to our suggestion that the students should not feel compelled to speak before they are ready and that they should be exposed to abundant comprehensible input. In the Community Language Learning approach, like Suggestopedia, considerable efforts are geared towards removing the learners' doubts and defenses to speed up and enhance acquisition and the teacher is more a resource person than an authoritative. Within the Community Language Learning approach, the learners' L1 is allowed to make the students feel more secure, which is not in line with my suggestion that the use of L1 should be kept to a minimum to avoid L1 interference. Students learn the L2 as a community and the resource persons are familiar with some counseling principles and techniqus to help the students overcome negative attitudes or barriers (Stevick 1976:125, 156-158).

Note that all these current innovative approaches attempt to remove psychological and affective barriers and in none of them age is a predetermined factor. Although we do not consider that it is possible for any method to be universally suitable and therefore do not endorse any one particular method mentioned so far exclusively, we do recommend the majority of techniques employed in the above-mentioned methods, other than the several techniques we already disputed. For example, the Active Listening Method may be employed in the initial stages followed by the Silent Way method, and Community Language Learning may be implemented within a Suggestopedia environment. The crucial point here is that there is a shared implicit notion that once the other barriers are removed, the learner's ultimate level of success should not be prejudged.

Last but not least, we still need to go back to the age issue and consider

its place in our foreign language education programs. It is entirely reasonable to conclude from our discussion above that the ideal learning environment for adults is simply more costly, yes, in all senses of the word, to set up; after all, children do enjoy the psychological and affective advantages naturally, while such conditions have to be mostly artificially facilitated or simulated for adults. Therefore, it is not unreasonable to further suggest that, even given the best intentions and efforts, the success rate among adult L2 learners will not surpass that of children. It simply does not make any sense that while we are trying our best to simulate the learning environment of typical young children to facilitate an accent-free adult L2, we do not take the full advantage of providing the opportunities for young children to be appropriately exposed to foreign languages. From a practical point of view, providing the same amount of opportunities to the same children a few years later, although it may cost the same, will produce less satisfactory results, unless more time is given and more efforts put in. Our position here is thus very simple: age is not an issue as far as the ability to acquire an accent-free L2 is concerned for adults can and do acquire L2 free of accent, but the children's ability to do so much more effortlessly should be capitalized by all means. In other words, teach them while they are young because to do so later is going to be more 'expensive'.

Therefore, it is most crucial to find the "optimal age" for L2 acquisition and implement our foreign language programs accordingly to maximize the cost-effectiveness, from the points of view of both the program providers and the students themselves. Various proposals have been put forth. For example, Skehan (1989) suggests that learners under the age of ten have a great advantage over older learners, whereas Magiste (1987) has demonstrated that children between six and eleven took some years less than older students to acquire the same amount of second language. In light of this, we cannot endorse the current practice in the Republic of China where English as a second language does not start until the first year of junior high school when the student is already twelve, and worse still, other foreign language courses are not available until years later. We thus strongly recommend that the foreign languages be available to elementary school and even kindergarten and preschool children. Furthermore, the traditional audiolingual method or the timed grammar translation method, which are known to be inadequate and out of touch with current findings on successful L2 education, should also be replaced with methods, such as a comprehension-based method, that are in line with the implications we have discussed to encourage acquisition, not conscious learning. And finally, testing

and evaluation should be designed to test the student's proficiency *in* the L2, not knowledge *about* the L2.

7. Conclusion

This article is concerned with the issue of foreign accent and in particular we are interested in the age difference in foreign accent. We have deliberated the dominant 'critical period' hypothesis quite extensively and concluded that there is no predetermined maturational constraints on acquiring a native-like accent of a second language. Nonetheless, from a practical point of view, there may be an optimal period for L2 acquisition, which foreign language programs should take full advantage of. We have further discussed a number of alternative factors that contribute to the age difference in foreign accent: cognitive, linguistic, environmental, social, and affective, and have related them in a coherent framework — the Monitor Model. Finally, we have discussed some of the implications for teaching foreign languages and made some practical suggestions.

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