

EFFECTS OF LENGTH OF RESIDENCE AND SPEECH ACTIVITIES ON DEGREE OF FOREIGN ACCENT

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ABSTRACT

A group of native Mandarin speaking professors teaching in a U.S. university with a mean length of residence (LOR) in North America of 12 years was rated as highly accented as a group of native Mandarin speaking professors teaching English in China. Different speech activities did not appear to affect degree of accent. However, long excerpts of filtered speech may be used with caution for accent rating.

1. INTRODUCTION

Previous research has examined different factors that influence adult L2 learners' degree of foreign accent. The single most important factor has been consistently found to be age of arrival (AOA) in native speaking countries [1, 2, 3]. In general, the earlier the learners are exposed to L2, the less accented they are judged to be. In contrast, the effect of LOR on degree of foreign accent has been found to be inconsistent. One of the reasons for the mixed findings might be due to the differences in LOR gap between the L2 speaking groups being examined [1, 2, 4]. For example, Trofimovich and Baker [5] found native Korean speakers with a mean LOR of 10 years in the U.S. were rated as accented as those with a mean LOR of three years. However, both groups were rated less accented than the inexperienced group with a mean LOR of only 3 months. In another study, Flege [2] found that foreign accent ratings obtained for 2 groups of native Mandarin speakers differing in LOR (1.1 vs 5.5 years) in the U.S. were not significantly different. Based on some of these findings, researchers hypothesized that after a rapid initial phase of learning, LOR does not affect L2 pronunciation of individuals who began learning L2 as adults [1].

In addition, the effect of LOR on degree of foreign accent is found to be related to different learning stages. Research has shown that additional years of LOR may not help to change the degree of L2 foreign accent for highly experienced learners

[1] while it does appear to make a difference for speakers at early phases of L2 learning [6,7].

The amount of L2 use has also been found to influence the perceived degree of foreign accent [3, 4] for both children and adult L2 learners with controlled age of learning (AOL) and LOR in L2 environment. Therefore, one problem with using LOR as a rough index of L2 experience is that LOR may not accurately reflect the quantity and quality of input and the amount of use of L2. On the other hand, other L2 experience that may also affect the perceived degree of foreign accent does not fall under the LOR category. For instance, formal instruction in L2 and regular L2 use in an English as a Foreign Language (EFL) situation may also influence the degree of foreign accent but neither has received much attention in the literature. One study [8] reported that English sentences produced by some highly successful late Dutch learners of English were rated as native-like by native English listeners. The authors speculated that these Dutch speakers' native-like English accent might be attributed at least in part to intensive training in L2 pronunciation. Their daily use of L2 in teaching the target language might also be a factor even though they had only one year of LOR in Britain at some point in the process of L2 learning. More studies are needed to investigate these factors and their impact on degree of foreign accent with various L1 speakers.

This study examines the effect of LOR on degree of foreign accent on two groups of highly advanced Mandarin learners of English who share all other learner characteristics but differ in LOR (12 vs. 0 year). The speakers' productions of sentences and extemporaneous speech as well as low-pass filtered speech were rated for degree of foreign accent by native English listeners. The use of three different speech samples was intended to examine the effect of speech activity on perceived degree of foreign accent. Previous studies examined mainly sentences and very few studies included more than 2 speech activities for foreign accent rating. The two research questions are:

1) Will highly advanced English learners with 12 years of LOR in North America be rated less accented in English than those controlled for other L2 experience but had zero LOR?

2) Will different speech activities influence the perceived degree of foreign accent?

2. METHOD

2.1. Speakers

Two groups of highly advanced native Mandarin learners of English participated as speakers. They were the America Professor Group (the AP Group) and the Chinese Professor Group (the CP Group). The AP group consisted of 10 professors (6 male, 4 female, mean age = 43.4, range 33-52) teaching at a university in the U.S. at the time of this study. They were all born and raised in China and studied English as a foreign language for a mean of 10 years at school and earned at least one university degree in China before they moved to North America. Their mean age of arrival (AOA) in North America was 31.3 years (23-37). Their mean LOR in North America was 12.4 years (5-21). All had earned at least one university degree in North America. They had taught at college level for a mean of 12.4 years (2-18) in various subject areas including science, engineering, business, education, and humanities. As expected, the AP group reported a very high mean percentage use of English, 97.5% (90-100%), outside the home but a mean of 37% (5%-95%) use of English at home.

The CP Group consisted of 10 professors (4 male, 6 female, mean age = 40.3, range 33-59) in a University in China. All had at least one university degree in English or English linguistics from China but none had earned a degree from an English speaking country. Some reported having taken an English phonetics course when studying for their English or linguistic majors. None had lived in an English speaking country for over 6 months and many had never been abroad by the time of this study. They taught English or English linguistics in a university in China for a mean of 13.2 years (4-25). Though all spoke English fluently, they reported seldom using English at home (mean use = 2.5%, range 0%-10%). However, they all spoke English exclusively in class while teaching and generally used English to prepare their English and linguistics courses.

Five native English speaking professors (3 male, 2 female, mean age = 40) formed a control

group (the EP Group). They were all from the same university where the AP group was recruited. The background information of the AP and CP groups is presented in Table 1. A series of one-way ANOVAs revealed no significant differences between the AP and CP groups on any variables except on L2 use at home and outside the home.

Table 1: Characteristics of the AP and CP Groups

Variables	Groups (n = 10 per group)	
	AP Group	CP Group
Age	43.4 (6.4)	40.3 (10.0)
Age of arrival in U.S.	31.3 (5.1)	---
Years of residence in U.S.	12.4 (5.1)	---
Age of learning (AOL)	11.4 (3.5)	13.1 (3.8)
Years of learning English	10.1 (4.1)	11.2 (3.1)
% L2 use outside the home	97.5 (4.2)	50 (0) ^a
% L2 use at home	37.0 (33.1)	2.6 (0.04)
Pronunciation self-rating ^b	4.5 (1.3)	4.5 (0.8)
Years of teaching	12.4 (5.6)	13.2 (8.3)

^a Estimated % use of English for teaching

^b Self-rating: along a scale of 1 (native-like) – 9 (heavy accent)

2.2. Stimuli

The stimuli included sentences, extemporaneous speech (utterances) and filtered utterances. The sentences were elicited through a reading task in which the speakers read a list of 10 short sentences at normal speed. Only two of the ten, one statement and one question, were used for rating: "most people like to listen to music", "do you have a gas cooker in your kitchen?" The utterances were elicited through interviews in which the speakers answered two related questions: "do you enjoy teaching?" and "what do you like the most about teaching?" The speakers heard the questions from the researcher twice and were given 1-2 minutes to prepare before they provided the answers. The recordings were made in a quiet room using a Sanyo mini cassette recorder (TRC-680MN) and an external microphone. The recorded sentences and interviews were digitized at a sampling rate of 22050 Hz with 16-bit resolution and normalized for peak intensity. For the utterances, a short excerpt of single continuous sample was extracted from the beginning of each speaker's answers using waveform editing. The length of the samples ranged from 10 -16 s. All utterances were cut at the end of a syntactic phrase or clause that sounds like the end of a unit, normally with falling intonation. Each selected utterance was also low-pass filtered

to remove segmental information but to preserve prosodic information such as stress, rhythm, and intonation [9]. The purpose of including filtered speech was to reduce the impact of segmental and grammatical errors on the accent rating. The total stimuli used for accent rating were 100 sentences (2 sentences \times 25 speakers \times 2 presentations), 25 utterances, and 25 filtered utterances. All stimuli were recorded onto a CD for presentation.

2.3. Listeners

The listeners were 11 native English speakers (4 male, 7 female, mean age = 27.6, range: 21-37) from the student population at the university where the AP and EP Group were recruited but none were familiar with any of the speakers. None reported being familiar with Mandarin accent. All reported having normal hearing.

2.4. Procedure

The two sentences were presented in two separate blocks. Within each block, the 25 sentences were randomized and presented twice. The 25 utterances and 25 filtered utterances were randomized and presented once in two separate blocks. The listeners rated the sentences first, followed by the utterances and filtered utterances. They performed the rating tasks in small groups of 3-5 in a sound treated language lab where the CD was played through a built-in speaker system at comfortable level. Each stimulus was presented once and the listeners rated each item they heard on an answer sheet by circling a number on a scale of 1 (native-like) to 9 (heavy foreign accent). Before the real rating tasks, the listeners practiced by rating sample sentences, utterances, as well as filtered utterances by both native and nonnative speakers not included in this study. They were encouraged to use the full scale while rating.

3. RESULTS

Both interrater reliability, ($\alpha = .735, .961, .975$) and intraclass correlations, ($R = .704, .946, .964$) for the 11 listeners' ratings ranged from moderate to very high for filtered utterances, sentences, and utterances respectively. There was little difference between the ratings of the two sentences. Therefore, a single mean rating for each speaker's sentences was obtained by averaging the 11 listeners' mean ratings of the 2 sentences. Each speaker's utterance and filtered utterance score was also obtained by taking the listeners' mean ratings.

Figure 1. The three speaking groups' mean foreign accent ratings given by native English listeners (N = 11)

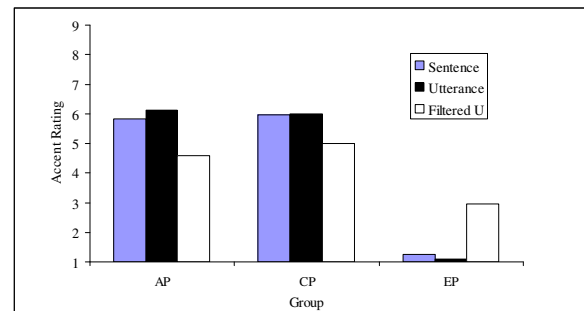


Figure 1 summarizes the mean ratings by stimulus type for the three speaking groups. The average ratings for the sentence, utterance, and filtered utterance were 5.8, 6.1 and 4.6 for the AP group, 6, 6, and 5 for the CP group, and 1.3, 1.1, and 3 for the EP group respectively. These scores were submitted to a two-way ANOVA with Group (AP, CP, EP) as between subject factor and Stimuli (sentence, utterance, filtered utterance) as repeated measures. The analysis yielded a significant mean effect of Group, $F(2,22) = 84.804, p = .000$, a non-significant effect of Stimuli, $F(2,44) = .440, p = .647$, and a significant Group \times Stimuli interaction $F(4,44) = 9.884, p = .000$. A series of one-way between group ANOVAs established significant differences between the groups on sentence, $F(2,24) = 55.076, p = .000$, on utterance, $F(2,24) = 74.948, p = .000$, and on filtered utterance, $F(2,24) = 8.667, p = .002$. Post hoc (LSD) multiple comparisons revealed no significant differences between the AP and CP groups on any stimulus type. The differences ($\alpha < .01$) were significant between the EP and AP groups and between the EP and CP groups across three stimuli.

A series of paired t-tests for each group on all the possible combinations of stimulus type revealed the Group \times Stimuli interaction was due to the differences between the groups on the ratings of the filtered utterance ($\alpha < .05$). For the AP group, the filtered utterance was rated significantly less accented (lower ratings) than the sentence and the utterance. The same held true for the CP Group, except that the difference was significant between the filtered utterance and the utterance but marginal between the filtered utterance and sentence ($p = .059$). The reverse was true for the EP group for which the mean rating of the filtered speech was significantly higher (less native-like) than both the sentence and utterance.

4. DISCUSSION AND CONCLUSIONS

For each speaking activity, the AP group was rated as highly accented as the CP group. In fact, the two groups obtained surprisingly similar ratings (within .2 point on a scale of 1-9) for both utterance and sentence. An inspection of individual speakers' ratings revealed that not a single AP or CP group member obtained a mean rating that fell within 2 standard deviations of the native English speakers' mean score, a standard often used to judge whether a nonnative speaker's speech is native-like or not [2, 8]. The findings provide negative answers for research question 1 which asked whether there is an effect of LOR on degree of perceived foreign accent. It appears that 12 years of LOR did not help the AP group get lower accent ratings as compared with the CP group that had no LOR in an English-speaking country at all.

Both groups were highly advanced learners and used English daily in their teaching careers. They were also comparable in years of formal L2 learning in China and years of teaching in English. Even though the AP groups used more L2 at home and at work than the CP group, which was the main difference between the two groups as indexed by the LOR, the AP group was not rated any less accented than the CP group. Surprisingly, both groups' mean self-rating of English pronunciation was 4.5 along a continuum of 1-9. It is interesting to note that L2 speakers seem to be fairly consistent in assessing their own L2 pronunciation.

In contrast to the findings [8] of some highly successful Dutch learners of English whose sentences were rated native-like and who had merely 1 year of LOR in Britain, none of the AP subjects of the current study were rated as native-like despite their comparable L2 use in university teaching and much longer years of LOR in the U.S. One important factor about the AP group was that, like the CP group, they all studied English formally at school for 10-11 years in China before moving to America and all had their first exposure to English at a very young age in an EFL situation. It is speculated that such first exposure to the type of input in an EFL situation may have a profound impact on their foreign accent. The mean AOA of the AP group was 31 years, relatively late in terms of AOA across studies. It is possible that extended years of LOR begun at relatively late age may not have any important effect on foreign accent, especially with those highly advanced learners who learned L2 in their home country.

The findings also provide negative answers to research question 2 which asked whether different speech activities, sentence vs. extemporaneous speech, have different effects on the perceived degree of foreign accent. For each group, the ratings of the sentences and the utterances were almost the same (fell within .2 point on a scale of 1-9). However, filtered utterances appeared to have attenuated Mandarin speakers' degree of accent to the native ear. This is neither surprising nor totally unexpected as the filtered utterances used for rating were relatively long (10-15s) and the listeners were not given any clue of the contents of what they were rating. Therefore, this task could be inherently more difficult than the rating of a filtered sentence in which the listeners were often provided the content of the sentence (in writing) they rated for accent [9]. In fact, as seen in Figure 1, even native English speakers' filtered utterances were rated significantly more "accented" than their sentences and utterances. The findings suggest long excerpts of filtered speech should be used with caution for accent rating.

5. REFERENCES

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