

An Experimental Study on the Sentence Stress Effect*

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ABSTRACT

This study examined the foreign accent of Korean speakers of English concerning vowel length and utterance position. It then attempts to explain the foreign accent of Koreans when they speak English. The method was to measure the sentence-initial and sentence-final vowels as spoken by Koreans. I chose these two positions, sentence-initial and sentence-final, in order to know if Korean speakers of English, compared with native English speakers, show a difference in sentence stress. I chose English diphthongs, because most Koreans have difficulty pronouncing these sounds. I found that Korean speakers of English as a second language do not know English sentence stress patterns and show a foreign accent, especially when using diphthongs.

Keywords: Sentence Stress, Foreign Accent, Vowel Length, English Diphthong, Utterance Position

1. Introduction

Native Korean speakers show a significant foreign accent when they speak English in many respects. A major area of foreign accent is found in vowel length differences between Korean speakers and English natives. Various factors can lead to the differences of English vowel length. However, this study focused on the effects of sentence stress as it relates to the usage of English diphthongs. The English diphthongs were chosen because it is clear that Koreans have difficulty pronouncing English diphthongs. In addition to this, English sentences with sentence stress pattern are typically difficult for Koreans of English to pronounce. When native English-speaking Americans pronounce English sentences, they follow the English sentence stress pattern but Koreans don't follow it. As a result, Koreans regularly produce a foreign accent when they speak English, especially in sentence-final positions.

To investigate the effects of sentence stress, I used figures from a previous study that can be found in tables (Park, HeeSuk 1997, 2001). These figures include information about

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English monophthongs and diphthongs.

2. Experiment

2.1 Material

For the experiment of diphthongs, five diphthongs- /aɪ/, /ɔɪ/, /aʊ/, /eɪ/, /oʊ/ -were used and five words-fly/aɪ/, joy/ɔɪ/, out/aʊ/, pay/eɪ/, coat/oʊ/ - containing these diphthongs were selected. After selecting the words, I put each word in sentence-initial and sentence-final position and the sentences were spoken five times by the subjects. The followings are the test words and sentences.

<test sentences>

sentence-initial: Fly the kite in the park.

sentence-final: I want to learn how to fly.

sentence-initial: Joy is a deeper emotion than happiness.

sentence-final: My newborn son brings me joy.

sentence-initial: Out beyond the fence is a garden.

sentence-final: My wife and I will go out.

sentence-initial: Pay me the money you owe me.

sentence-final: A good worker is worth his pay.

sentence-initial: Coat the walls with paint.

sentence-final: I have a warm winter coat.

In addition to this, another experiment was designed to examine the duration of the 8 English vowels: front vowels /ɪ, e, æ/, mid vowels /ʌ, ɑ/, and back vowels /u, o, ɔ/. Because the main purpose of this experiment is to investigate the sentence stress effect, I intended to see the phenomenon with eight English vowels. The following words having those vowels were selected.

With these words in both sentence-initial and sentence-final, I made 16 test sentences. The reason why I placed the words in both sentence-initial and sentence-final was that there is a tendency for sentence-final syllables to be longer than sentence-initial and sentence-medial syllables. With this experiment, I wanted to see the phenomenon of sentence-final syllables being longer than sentence-initial syllables in Koreans and Americans speaking English.

<test sentences>

sentence-initial: Possibility of war grows greater each day.

sentence-final: War, while not a probability, is a possibility.

sentence-initial: Affection is the glue of family relationships.

sentence-final: In order to develop properly, children need much affection.

sentence-initial: Satisfaction is certain when one does one's best.

sentence-final: The finest products guarantee satisfaction.

sentence-initial: Activity is the best exercise.

sentence-final: Swimming is the best aerobic activity.

sentence-initial: Justify yourself to yourself and you need to fear no man.

sentence-final: All that a man does, he must be willing to justify.

sentence-initial: Thoughtfulness is a wonderful virtue.

sentence-final: The students displayed much helpfulness and thoughtfulness.

sentence-initial: Photograph anything except the military installations.

sentence-final: Some paintings have as much realism as a photograph.

sentence-initial: Bookstore opens at 9 A.M. today.

sentence-final: It is only 100 meters to the bookstore.

2.2 Subjects

For this experiment 12males-6 KATUSA soldiers and 6 Americans-were recruited from an American military base at Pyungtaek to serve as subjects. The Korean subjects were from Seoul and Kyunggi province whose residents use standard Korean. All the KATUSA subjects served more than one and a half year and used English with Americans for more than one and a half year because they worked at an American military base at Pyungtaek. Six of KATUSA subjects were university students and all the American subjects graduated from university in U.S.A.

2.3 Recording and measurement

Audiotaped recordings were made in an office room and audiotaped words were recorded into the computer. A cassette tape recorder made by SANYO was used to record the test sentences and the recorder's model was M1700F. The microphone used was the condenser microphone in the recorder. The test sentences were recorded, and the subjects were asked to read each sentence five times at normal speed on Macintosh computer LCIII, which was used to analyze the voice signal by Signalize 2.45.

3. Results and Discussion

3.1 Koreans' foreign accent of English vowel duration

Table 1, comparison of English vowel durations between Koreans and Americans,

(Park, HeeSuk, 1997) clearly illustrates a significant difference in English vowel duration between Koreans and Americans. The vowels that were studied in this paper were /ɑ, ε, æ, ɪ, ʌ, ɔ, o, u/. Koreans tend to pronounce vowels which have stress in the final word of a sentence significantly shorter (the vowel /æ/ in "satisfaction" for example) than the same vowel in sentence-initial position. In contrast, Americans tend to pronounce those same vowels in the final word of a sentence significantly longer than sentence-initial position. As a result, Americans' pronunciation of these English vowels were lengthened but the native Korean speakers' pronunciation of these English vowels were shortened.

3.2 Koreans' foreign accent of English diphthongs

Table 1, Comparison of English diphthong length between KATUSA and Americans, (Park, HeeSuk 2001) shows a significant difference in the length of English diphthongs between Koreans and Americans. By using t-test on the duration of English diphthong we can determine that the differences in length of English diphthongs in sentence-initial position between Koreans and Americans were not significant. However a significant difference can be found in the length of English diphthongs in sentence-initial position between Koreans and Americans. Now I would like to explain the reason why the t-test results were somewhat different when we compared English diphthongs with simple English vowels.

3.2.1 English diphthong length in sentence-initial position

Table 1. The average length of five English diphthongs in sentence-initial position

| subjects | mean | standard deviation | case | t-value |
|-----------|--------|--------------------|------|---------|
| Koreans | 153.71 | 11.35 | 6 | -2.86* |
| Americans | 134.66 | 11.74 | 6 | |

*P<.05

Table 1 shows the t-test result of the average length of five English diphthongs in sentence-initial position. According to Table 1, the average length of diphthongs in sentence-initial position of the Koreans was greater than that of the Americans. The table also shows that the difference in t-value was significant.

3.2.2 English diphthong length in sentence-final position

Table 2. The average length of five English diphthongs in sentence-final position

| subjects | mean | standard deviation | case | t-value |
|-----------|--------|--------------------|------|---------|
| Koreans | 173.95 | 13.80 | 6 | n.s |
| Americans | 168.26 | 14.91 | 6 | |

n.s = nonsignificance

Table 2 shows the t-test results of the average length of English diphthongs in sentence-final position. Although Table 2 shows that the average length of native Korean speakers of English pronunciation of diphthongs in the sentence-final position was greater than that of the native English speaking Americans, the difference was small and not significant. One can summarize this information into the following comment: The difference of length between the five English diphthongs as produced by native Korean speakers of English and native English-speaking Americans was significant by t-value in the sentence-initial position but in the sentence-final position the difference was not significant.

4. Conclusion

From Table 1 (Park, HeeSuk, 1997) we can determine that the difference of English vowel length in sentence final position is one cause of a native Korean English speaker's foreign accent. I believe that sentence stress is one reason for the sentence final lengthening effect native English-speaking Americans. However, because Koreans are not used to this rhythm, they don't realize this sentence stress and, therefore, show a foreign accent in English vowel lengths.

If we compare the average length of English vowels in sentence final position of Koreans with that of Americans, we can see that Koreans tend to pronounce the English vowels, except /o/, shorter than Americans. The reason Koreans pronounce the English vowel /o/ longer in sentence final position than Americans is that most Koreans don't understand the concept of English diphthong /o/. In other words, many Koreans pronounce the diphthong /o/ like two separate monophthongs. As a result, in sentence final position, the duration of the English diphthong /o/ is greater when produced by a Korean than by an American. In sentence-final position, we can see that the English diphthong length of a native English speaker was also shorter than that of the native Korean speakers of English, though not significant.

This study, then, shows that Koreans consistently produce English diphthongs with non-native length. Koreans do not realize the phenomenon of the diphthong, which is defined as the nucleus plus a glide. As a result, Koreans showed a foreign accent in the length of their English diphthongs.

The result of this study show a distinct difference between Korean and American sentence final lengthening, with the Korean lengthening being significantly less than the American lengthening. I may conclude that the difference in pronunciation is a result of Korean's disregarding sentence stress. Finally, further research in this area that includes more students of different regional dialects is needed to provide wider data of vowel

lengths between these two languages.

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