A study on the foreign accent of Koreans*

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ABSTRACT

This study was done to investigate the English vowels in relation to the foreign accent. In this study, I also tried to find out the foreign accent of the English diphthong /o/ and front low vowel /æ/ when Koreans speak English. The reason why I chose these vowels is that these vowels, /o/ and /æ/, are difficult for Koreans to discern and pronounce. Koreans show a foreign accent in their pronunciation. In order to find out the reason for a Korean foreign accent, experiments were carried out with the help of acoustic instruments. According to the results of the experiment, Koreans showed a foreign accent in their English pronunciation of vowels in relation to their utterance positions. Americans showed a final lengthening effect but Koreans showed a final shortening effect. This means that Koreans showed a foreign accent in the final stressed syllable of a sentence. In addition to this, the duration of two English vowels, /o/ and /æ/, showed considerably different features between Koreans and Americans. In fact, in the pronunciation of the diphthong /o/, the tongue moves from one position to another. The two articulations of a diphthong can be described as the nucleus plus a glide. However, most Koreans have no idea of this phenomenon and pronounce the diphthongs like two separate monophthongs. This causes a great difference in the lengths of English diphthong /o/ between Koreans and Americans.

Keywords: foreign accent, vowel length, English diphthong, utterance position

1. INTRODUCTION

This study was done to investigate the English vowels experimentally and find out the foreign accent of Koreans. Though pronunciation of Koreans shows foreign accent in many ways, I investigated it in three aspects by focusing on English vowel length. First of all, I wanted to look into the vowel lengths in relation to their utterance positions between Koreans and Americans. I also wanted to know if /o/ vowel, which shows diphthong like quality, and front low vowel /æ/ show a foreign accent by comparing vowel length differences between Koreans and Americans. The

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reason why I wanted to deal with /o/ vowel and /æ/ vowel is that Koreans have difficulty in pronouncing them since they do not know the concept of diphthong and front low vowel, which we can often see in class. In fact, in the pronunciation of the the diphthong /o/, the tongue moves from one position to another. However, most Koreans pronounce the diphthongs like two separate monophthongs. This causes a great difference in the lengths of English diphthong /o/ between Koreans and Americans. Therefore I selected the diphthong /o/ as the experimental object, and I will research the foreign accent of the English vowel /o/ in Koreans speaking English. I also selected the English front low vowel /æ/ as the experimental object because in Koreans speaking /æ/ they pronounce it like /e/. As a result, they show a foreign accent of the English vowel /æ/.

In this article I tried to find out the vowel lengths in relation to their utterance positions and see the foreign accent of English vowels especially diphthong /o/ and English front low vowel /æ/. Finally I want to seek a solution to the way Koreans pronounce the English vowels, showing a foreign accent in Koreans speaking English.

II. LITERATURE REVIEW

1. Effects of utterance position on duration

It has been pointed out that the duration of vowels shows different features in relation to the utterance positions. Han(1964) found that Korean vowels are distinctive in length and also showed the vowel length of Korean in different syntactic levels. According to the data, the duration of the word in the sentence final position is shorter than the duration of an isolated word by 10 ~ 20%, the duration of the word in the sentence initial position is shorter than the duration of an isolated word by 30 ~ 40%, and the duration of the word in the sentence medial position is shorter than the duration of an isolated word by 60%. But the data also show that, like this phenomenon of the shortening effect of word duration, the shortening effect of vowel duration also occurs. According to that data, vowel duration as well as word duration becomes short in the sentence initial and final position at a similar rate. Kim Myung-Hee's investigation(1993) revealed that the duration of vowels was 1.5~2.5 times longer than the duration of vowels investigated by Han(1964). She ascribed the reason of the results to the lengthening effect of the vowel of the isolated word.

Oller(1973) investigated the duration of segments in different positions in English. In his experiment, which focused on native speakers, he revealed that the duration of final syllables was longer than that of other syllables.

2. The lengthening effect of final position in English

In general there have been three different views about the duration of final syllables. First, Kim Kong-On(1974) and Oller(1973) said that the final syllable of the frame sentence is the longest and the first syllable of the test utterances is longer than the intermediate syllables. Second, Lindblom(1968) said that, in Swedish, segments in the final syllable of a test utterance are longer than segments in word medial syllables, and the durations of the segments in the word initial syllable are the shortest. Third, Bertinetto(1978) asserts that in Italian, which is a syllable-timed language, there isn't any lengthening effect of the final syllable.

Even though they say that the lengthening effect of the final syllable is observed quite consistently, they view the reason of the phenomenon two ways. Lindblom suggests that the longer duration of an utterance final syllable is due to the compensation of the lower intensity in the final syllable. However Kim Kong-On(1974: 142) argues that Lindblom's hypothesis is too general to be used for any practical purpose because the basic term in his hypothesis, that is 'energy' or 'force of articulation', is not precisely defined. Finally he asserts that the final lengthening is simply due to the pause at the end of a sentence, whose presence causes physiological as well as psychological relaxation near the end of the sentence.

Ⅲ. EXPERIEMENT

1. Material

This experiment is designed to examine the duration of the 8 English vowels: front vowels /ɪ, ɛ, æ/, mid vowels /ʌ, ɑ/, and back vowels /u, o, ɔ/. Because the main purpose of this experiment is to investigate the foreign accent of Koreans speaking English, I intended to see the phenomenon with 8 English vowels. The reason why I chose these 8 vowels is that these 8 vowels are used in the English vowel scheme devised by J.S. Kenyon and that scheme is popular in analyzing the English vowel system.

I selected test words having these vowels with two criteria. First, these words are used in high school English textbooks used in Korea, so I think these are common and familar to Koreans. Second, these are all stressed vowels and placed between voiceless plosives or fricatives, so they are easy to segment. The following words having those vowels are selected.

<words>

possibility /ɑ/

affection /ɛ/
satisfaction /æ/
activity /ɪ/
justify /ʌ/
thoughtfulness /ɔ/
photograph /o/
bookstore /u/

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 is that there is a tendency for sentence-final syllables to be longer than sentence-initial and sentence-medial syllables. With this experiment, I just wanted to see the phenomenon of sentence-final syllables being longer than sentence-initial syllables in Koreans and Americans speaking English. I have made test sentences pronounced within a 'breath group'. When they are long enough to have more than two breath groups, I used a comma to distinguish them.

<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. Subjects and Procedures

For this experiment 9 males — 6 Koreans and 3 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 Korean subjects were over thirty and they used English with Americans for more than 5 years because they worked at an American military base at Pyungtaek. Each of the 9 subjects graduated from university and worked at the same place.

Audiotaped recordings were made in the 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 name of the recorder's model was M1700F. The microphone used was the condenser microphone in the recorder. The test sentences were recorded with American English, and the subjects were asked to read each sentence 5 times at normal speed. Macintosh computer LCIII was used to analyze the voice signal and the name of the program was Signalize 2.45. I analyzed the vowels in my office at Namseoul and the analysis itself was not difficult because the target vowels were located between voiceless plosives or fricatives. However, in the place where the target vowel was followed by a voiced sound, I had to pay special attention to it. Whenever I was not convinced, I was helped by a spectrogram.

3. Results

Subjects read the English test words and sentences with American English accent, and they didn't read the words and sentences separately. They read the words and after reading the words they continued to read sentences. The test words and sentences were repeated five times by each of the 9 subjects. I didn't take measurements from the first reading but took measurements from the last four readings. The test words and sentences were given in order to ascertain that the subjects have a clear understanding of them. The average durations of English vowels in the test sentences are presented in Table 1 below.

Table 1

Comparison of English vowel durations between Koreans and Americans (Park HeeSuk 1997)

vowel	position	subjects			
		Koreans		Americans	
		mean	standard deviation	mean	standard deviation
possibility /ɑ/	word	83.88	8.53	86.57	3.23
	s-initial	81.09	16.64	88.31	.69
	s-final	71.87	15.37	103.20	2.05
affection /ɛ/	word	83.00	18.19	74.26	11.56
	s-initial	79.03	14.09	74.46	4.51
	s-final	69.31	14.09	83.54	5.45
satisfaction /æ/	word	89.67	20.99	120.53	5.03
	s-initial	86.26	22.08	118.15	4.16
	s-final	77.75	18.35	125.79	5.05
activity /ɪ/	word	69.43	18.30	56.04	1.60
	s-initial	66.39	13.78	63.20	2.23
	s-final	62.48	13.57	67.30	6.69
justify /ʌ/	word	76.87	11.58	67.73	7.93
	s-initial	78.89	9.77	66.62	9.45
	s-final	71.99	13.79	80.25	2.99
thoughtfulness /ɔ/	word	105.73	19.94	108.32	10.70
	s-initial	106.01	29.36	107.12	10.98
	s-final	95.06	24.91	114.48	10.36
photograph /o/	word	96.50	18.19	70.50	1.07
	s-initial	87.52	20.14	57.94	3.28
	s-final	80.99	21.00	65.25	2.72
bookstore /u/	word	71.57	7.98	59.61	2.52
	s-initial	72.71	8.91	55.68	7.71
	s-final	70.36	12.98	67.25	3.98

unit: ms

* s-initial=sentence initial s-final=sentence final

Ⅳ. RESULTS AND DISCUSSION

1. Koreans' foreign accent of English vowel duration

A comparison of English vowel duration was made between Koreans and Americans. By table 1 we can see that in the English vowel duration there is a big difference between Koreans and Americans. That is, Koreans tend to pronounce the final syllable of a sentence significantly shorter than in any other place in the sentence. However Americans tend to pronounce the final syllable of a sentence significantly longer than in any other place in the sentence. As a result, although Koreans and Americans show the similar English vowel duration in the word level, in the sentence final position, they show the different features. That is, Americans' pronunciation of these English vowels are lengthened but Koreans' pronunciation of these English vowels are shortened.

Table 2

t-test results of /ɑ/ vowel duration

position	subjects	mean	standard deviation	case	degree of freedom	t-value
word	Koreans	83.88	8.53	6	7	n.s
	Americans	86.57	3.23	3		
s-initial	Koreans	81.09	16.64	6	7	n.s
	Americans	88.31	.69	3		
s-final	Koreans	71.87	15.37	6	7	-3.40 **
	Americans	103.20	2.05	3		

* $p < .05$ ** $p < .01$

n.s = not significant

When English /ɑ/ vowel comes in a word and sentence-initial position, there is no significant difference between Koreans and Americans. But in the sentence-final position there is a significant difference between Koreans and Americans((t)=-3.40, p<.01).

Table 3

t-test results of /ɛ/ vowel duration

position	subjects	mean	standard deviation	case	degree of freedom	t-value
word	Koreans	83.00	18.19	6	7	n.s
	Americans	74.26	11.56	3		
s-initial	Koreans	79.03	14.09	6	7	n.s
	Americans	74.46	4.51	3		
s-final	Koreans	69.31	14.09	6	7	n.s
	Americans	83.54	5.45	3		

* $p < .05$ ** $p < .01$

n.s = not significant

According to Table 3, regardless of the position of the English vowel /ɛ/, there is no significant difference in English vowel duration between Koreans and Americans. However, in the sentence-final position, Americans' average duration of English vowels is longer than Koreans'

Table 4

t-test results of /ɪ/ vowel duration

position	subjects	mean	standard deviation	case	degree of freedom	t-value
word	Koreans	69.43	18.30	6	7	n.s
	Americans	56.04	1.60	3		
s-initial	Koreans	66.39	13.78	6	7	n.s
	Americans	63.20	2.23	3		
s-final	Koreans	62.48	13.57	6	7	n.s
	Americans	67.30	6.69	3		

* $p < .05$ ** $p < .01$

n.s = not significant

According to Table 4, regardless of the position of the English vowel /ɪ/, there is no significant difference in English vowel duration between Koreans and Americans. However, in the sentence-final position, Americans' average duration of English vowels is longer than Koreans'.

Table 5

t-test results of /ʌ/ vowel duration

position	subjects	mean	standard deviation	case	degree of freedom	t-value
word	Koreans	76.87	11.58	6	7	n.s
	Americans	67.73	7.93	3		
s-initial	Koreans	73.89	9.77	6	7	n.s
	Americans	66.62	9.45	3		
s-final	Koreans	71.99	13.79	6	7	n.s
	Americans	80.25	2.99	3		

* $p < .05$ ** $p < .01$

n.s = not significant

According to Table 5, regardless of the position of the English vowel /ʌ/, there is no significant difference in English vowel duration between Koreans and Americans. However, in the sentence-final position, Americans' average duration of English vowels is longer than Koreans'.

Table 6

t-test results of /ɔ/ vowel duration

position	subjects	mean	standard deviation	case	degree of freedom	t-value
word	Koreans	105.73	19.94	6	7	n.s
	Americans	108.32	10.70	3		
s-initial	Koreans	106.01	29.36	6	7	n.s
	Americans	107.12	10.98	3		
s-final	Koreans	95.06	24.91	6	7	n.s
	Americans	114.48	10.36	3		

* $p < .05$ ** $p < .01$

n.s = not significant

According to Table 6, regardless of the position of the English vowel /ɔ/, there is no significant difference in English vowel duration between Koreans and Americans. However, in the sentence-final position, Americans' average duration of English vowels is longer than Koreans'.

Table 7

t-test results of /u/ vowel duration

position	subjects	mean	standard deviation	case	degree of freedom	t-value
word	Koreans	71.57	7.98	6	7	2.46 *
	Americans	59.61	2.52	3		
s-intial	Koreans	72.71	8.91	6	7	2.80 *
	Americans	55.68	7.71	3		
s-final	Koreans	70.36	12.98	6	7	n.s
	Americans	67.25	3.98	3		

* $p < .05$ ** $p < .01$
n.s = not significant

According to Table 7, in both the word position((t)=2.46, p<.05) and sentence-initial position((t)=2.80, p<.05), there is a significant difference in English vowel duration between Koreans and Americans. However, in the sentence-final position, there is no significant difference in English vowel duration between Koreans and Americans.

2. Koreans' foreign accent of English diphthong /o/ duration

Koreans pronounce most of the English vowels shorter than Americans do in the sentence-final position. On the contrary, Koreans pronounce the English diphthong /o/ longer than Americans do in the sentence-final position. It is a strong evidence that Koreans are having difficulty in understanding English diphthong /o/ and pronouncing it. Using the following tables, we can see the Koreans' actual pronunciation of English diphthong /o/ and find out the Koreans' foreign accent of English diphthong /o/.

Table 8

t-test results of /o/ vowel duration

subjects	position	mean	standard deviation	case	degree of freedom	t-value
Koreans	word	96.50	18.19	6	5	3.81 *
	s-final	80.99	21.00			
Americans	word	70.50	1.07	3	2	n.s
	s-final	65.25	2.72			

* $p < .05$ ** $p < .01$
n.s = not significant

Table 8 shows the t-test results of diphthong/o/ between Koreans and Americans when the diphthong comes in the word and sentence-final position. The results of this table show different feature from those of the preceding tables. Table 1 showed that, in the sentence final position, Americans pronounce 7 out of 8 English vowels longer than in any other position. However, in /o/ vowel, the duration of word position is longer than that of sentence-final position. That means, in /o/ vowel, that Americans pronounce the English vowel /o/ longer in word position than sentence-final position. I assume that the English vowel /o/ has a different property because it tends to be a diphthong when it is stressed. From the results of this table, I think that Americans pronounce English diphthong /o/ longer in word position than sentence-final position. Now I want to compare the duration of the diphthong /o/ in the other positions: sentence-initial and sentence-final.

Table 9

t-test results of /o/ vowel duration

subjects	position	mean	standard deviation	case	degree of freedom	t-value
Koreans	s-initial	87.52	20.14	6	5	3.88 *
	s-final	80.99	21.00			
Americans	s-initial	57.94	3.28	3	2	n.s
	s-final	65.25	2.72			

* $p < .05$ ** $p < .01$

n.s = not significant

Table 9 shows the t-test results of diphthong/o/ between Koreans and Americans when the diphthong comes in the sentence-initial and sentence-final position. According to Table 9, regardless of the position of the English diphthong /o/, Americans don't show significant difference in duration. Americans' average duration of English vowel /o/ is longer in the sentence-final position than sentence-initial position. Comparing with the sentence-initial position, I can see the sentence-final lengthening effect in American pronunciation even in English diphthong /o/.

Table 10

t-test results of /o/ vowel duration

position	subjects	mean	standard deviation	case	degree of freedom	t-value
word	Koreans	96.50	18.19	6	7	2.39 *
	Americans	70.50	1.07	3		
s-initial	Koreans	87.52	20.14	6	7	2.44 *
	Americans	57.94	3.28	3		
s-final	Koreans	80.99	21.00	6	7	n.s
	Americans	65.25	2.72	3		

* $p < .05$ ** $p < .01$

n.s = not significant

According to Table 10, Koreans pronounce the English diphthong /o/ longer than Americans, and it shows a significant difference in both the word position((t)=2.39, p<.05) and sentence-initial position((t)=2.44, p<.05) between Koreans and Americans. Although there is no significant difference in English diphthong /o/ duration between Koreans and Americans in the sentence-final position, Koreans' mean is relatively higher than Americans'. The conspicuous thing is that, regardless of the position, Koreans' mean is higher than Americans'. That means that most Koreans pronounce the diphthong /o/ like two separate monophthongs. This causes a great difference in the lengths of English diphthong /o/ between Koreans and Americans. As a result Koreans show a foreign accent in speaking English diphthong /o/.

3. Koreans' foreign accent of English vowel /æ/

Table 1 reveals that the vowel that shows the biggest difference in duration between Koreans and Americans is the English front low vowel /æ/. This means that Koreans show a foreign accent of English vowel /æ/ in length. In every position Americans pronounce the English vowel /æ/ longer than Koreans, and the difference in length becomes the biggest in sentence-final position. The difference of the duration of the English front low vowel /æ/ in the sentence-final position is 48.04ms.

Table 11

t-test results of /æ/ vowel duration

position	subjects	mean	standard deviation	case	degree of freedom	t-value
word	Koreans	89.67	20.99	6	7	-2.43 *
	Americans	120.53	5.03	3		
s-initial	Koreans	86.26	22.08	6	7	-2.40 *
	Americans	118.15	4.16	3		
s-final	Koreans	77.75	18.35	6	7	-4.31 **
	Americans	125.79	5.05	3		

* $p < .05$ ** $p < .01$

According to the table 11, in every utterance position, Koreans and Americans show significant difference in vowel length. Americans' mean is much higher than Koreans'. This means that Koreans are having trouble pronouncing /æ/. From these results, I assume that the English vowel /æ/ is an obstacle in Koreans' learning the English language.

V. CONCLUSION

I have looked into the Koreans' foreign accent of English by focusing on English vowel length. Also I have investigated the difference of the English vowel length between Koreans and Americans using the experiment results. Especially I have looked into English front low vowel /æ/ and English diphthong /o/, which show a foreign accent in Koreans, more carefully. I assume this experiment is meaningful when I think that the 9 subjects are all university graduates and use the standard language.

According to the table figures, Americans show lengthening effect in the sentence-final position stressed vowels. But Koreans show shortening effect in that position. So I can see that the difference of English vowel length in sentence-final position is one of the causes of Koreans' foreign accent. I could see that in pronouncing English diphthong /o/ and front low vowel /æ/, Koreans showed a foreign accent. I assume that in pronouncing English front low vowel /æ/ Koreans don't use fully their articulatory muscles. I also assume that the reason of foreign accent of Koreans' diphthong /o/ is that they think of the diphthong /o/ as two separate vowels.

I assume that this foreign accent of English diphthong /o/ stems from the phonetic notation of English-Korean dictionary published in Korea. Most of the English text books used in middle and high schools take the English phonetic notation form

invented by Daniel Jones. According to his notation form, English diphthong is described as /ou/, so most Koreans, unaware of the English diphthong /o/, pronounce it like two separate vowels. As a result, when Koreans speak English, the duration of English diphthong /o/ becomes long. I assume that, when Koreans speak 'boat' and 'omit', the first syllable of the words will become longer. But I couldn't experiment with that words. So I wish if I had experimented many diphthongs. I think after this experiment related research on this should follow.

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