English Language & Literature Teaching, Vol. 20, No. 4 Winter 2014

Comparison of the Effects of Pronunciation Learning from an English Native Speaker's Correction and Self-correction: With Focus on English Voiced Stops and Word Duration

Yungdo Yun
(Dongguk University - Seoul)

Yun, Yungdo. (2014). Comparison of the effects of pronunciation learning from an English native speaker's correction and self-correction: With focus on English voiced stops and word duration. *English Language & Literature Teaching, 20*(4), 127-143.

This paper investigates two most common pronunciation learning methods. One is correction by a native speaker of English and the other is self-correction using the words recorded by a native speaker of English. The research is focused on English word-initial voiced stops and word durations. Two groups of Korean speakers participated in controlled experiments. One group self-corrected their pronunciations and the other was corrected by the native speaker of English. The results from the experiments showed that neither of the learning methods did not show statistically significant effects on the word-initial voiced stops, but both methods showed statistically significant effects on the word durations. The experiments also showed that phonological structure of Korean affects Koreans' pronunciation of English words.

[learning method/native speaker/self-correction/voiced stop/duration]

I. INTRODUCTION

Many researches have been done for second language learning. Since Lado (1957) suggested Contrastive Analysis Hypothesis, many second language learning models such as Flege's (1995) Speech Learning Model and Best's (1995) Perceptual Assimilation Model have been proposed. The basic hypothesis of these models is that phonological contrast of the learners' native language affects production and perception of their second language. This hypothesis has been proved by many follow-up researches.

교보문고 KYOBO Book Centre

There has been researches on how Koreans produce and perceive English sounds. Schmidt (1996) asked Koreans to write Korean orthographies corresponding to English stops they heard. Then, Koreans provided Korean 'ㅍ, ㅌ, ㅋ' for English word-initial stops /p, t, k/. But they were confused when they heard English word-initial /b, d, g/, thus provided both 'ㅂ, ㄷ, ㄱ' and 'ㅃ, ㄸ, ㄲ'. This founding means that Koreans perceive English word-initial stops as both lenis and fortis stops as found in the Korean sound system. Kim (2002) reports that native speakers of English perceive Koreans' production of 'ㅂ, ㅍ' as /p/, and 'ㄷ, ㅌ' as /t/, and 'ㄱ, ㅋ' as /k/.

The most common method for teaching English pronunciations is to repeat an English teacher's pronunciation. It is widely used in English classes in Korea. Kim (2009, 2010) conducted a production experiment using word-initial voiceless aspirated stops /p, t, k/. One group of Koreans produced English words 'pie', 'tie', and 'car' after they had practice by repeating English speakers' pronunciation of these words. The other group of Koreans heard phonetic explanations from a Korean phonetics professor about how to produce these words. Kim compared the VOTs (voice onset time) of the word-initial stops produced by both groups and found that the latter group's VOTs were closer to those of the English speakers.

Yun and Lee (2012) conducted a production experiment on English voiceless unaspirated stops as found in English words 'open', 'stop', and 'walking'. These stops are known to be most similar to Korean 'ㅃ, ㄸ, ㄲ'. One group of Koreans practiced these words by repeating English speakers' pronunciations of the words, and the other group heard explanation of the stops from a Korean phonetics professor. Yun and Lee compared their pronunciations, and found that the latter group's VOTs were closer to those of the English speakers.

Yun and Lee (2013) also conducted a production experiment on word-initial voiced stops /b, d, g/. But this time Koreans' production of these stops was very different from that of English speakers regardless of whether the Koreans repeated English speakers' pronunciations or they heard explanations from a Korean phonetics professor. Yun and Lee assume that the phonological structure of Korean affected the Koreans' production of the English word-initial voiced stops since word-initial stops 'ㅂ, ㄷ, ㄱ' are all voiceless in Korean.

Although the previous research shows negative aspects of the usefulness of native speakers of English on teaching English pronunciations, their roles are still important in English classes considering accuracy and fluency of English pronunciations. Koreans may not have a chance to hear phonetic explanations when they are in English class and when they are doing self-study using audio tapes or CDs. Students and teachers do not typically consider theoretical issues such as native language transfer in classroom environments. Therefore, pronunciations of native speakers of English are still norms that students should follow.

교보문고 KYOBO Book Centre

Thus, I considered two most common pronunciation learning methods using a native speaker of English. One is the correction by a native English teacher as typically used in English conversation classes. The other is the self-correction of their pronunciations by repeating the English words recorded by a native speaker of English, which second language learners typically do using audio tapes or CDs. I will conduct experiments on the production of the voiced stops and word durations produced by two groups Koreans, and compare which learning methods are effective.

Based on the previous researches, I assume that the correction of voiced stops may not work or at least not effective. Yun (2005, 2009, 2011) conducted a perception experiment on English vowels such as /ɛ, æ/. He found that Koreans relied on vowel durations when they could not identify vowel formants. Based on this, I assume that duration correction will be effective.

The limitations of this study are, first, that the Korean college students participated in the experiment cannot represent all of the Korean learners of English in Korea, and second, that this study investigates the effects of pronunciation learning during short amount of time, thus, does not check whether the correction effects continue during life time or at least for a long period of time. Nonetheless, this study is valuable since it investigates the effects of two most typical pronunciation learning methods by a native speaker of English.

II. PRODUCTION OF ENGLISH VOICED STOPS BY KOREANS

1. Research Methods

1) Subjects

Two groups of Korean college students participated in the experiment. Each group consisted of 23 students. The first group, Group A, is composed of 13 male and 10 female students. Their pronunciations were corrected by a native-speaking English professor. The second group, Group B, consisted of 8 male and 15 female students. They repeated the English words recorded by the native-speaking English professor and corrected their pronunciations by themselves. The English professor was born in Kansas City in the U.S. He had been teaching English in Korea for 9 years until the experiment was conducted. All of the participants did not stay in English-speaking countries for more than six months. Thus, I assumed that their stay in English-speaking countries would not affect the experiment. The participants were chosen only from Seoul dialect speakers to avoid the influence of the participants' dialects. They were all born and grew up in Seoul and Kyung-gi Province. Table 1 shows the information of the participants.

교보문고 KYOBO Book Centre

TABLE 1
Information about the Participants

Group	Gender	Number	Age	Growth Area	Pronunciation Disability
Group A	Male	13	19-27, M=21.2	Seoul, Kyung-gi	None
	Female	10	20-26, M=20.5		
Group B	Male	8	19-26, M=21.3	Seoul, Kyung-gi	None
	Female	15	19-28, M=20.1		

All of the participants did not undergo the pronunciation disability. They were all twenties when they participated in the experiment.

2) Recording and Analyses

The recording was done at the sound-attenuated booth in the English Clinic of D-University. The two groups of participants recorded the English words ‘best’, ‘desk’, and ‘get’ before their pronunciations were corrected. Then, the native-speaking English professor, CM, corrected the pronunciations of the Group A participants. He pronounced the above words and corrected the Group A participants’ pronunciations including stress patterns, individual consonants and vowels. The participants repeated after the native-speaking English professor. Then, they recorded these words again. The participants of the Group B also recorded these words after they had practice by repeating the words recorded by CM, and corrected their pronunciations by themselves.

When the participants recorded the words, they put short pauses between the words. This is necessary to avoid possible problems caused by connected words when phonetic analyses are done. They recorded the words three times. I used the words in the middle when I did the phonetic analyses of them.

I used Sound Forge 7.0 to record the words. The microphone was Prime MEC (Mandai Co., LTD). A windshield was placed in front of the microphone to avoid air puffing. The participants pronounced the words around 10 centimeters away from the microphone. The sampling rate was 44100 Hz. The headphone used to hear the recorded sounds was Senheiser PC350, and Praat 5.3.79 (Boersma and Weenik, 2009) was used to analyze the words phonetically. I used SPSS 19.0 for statistical analyses such as average, standard deviation, and paired t-test.

2. Results and Discussion

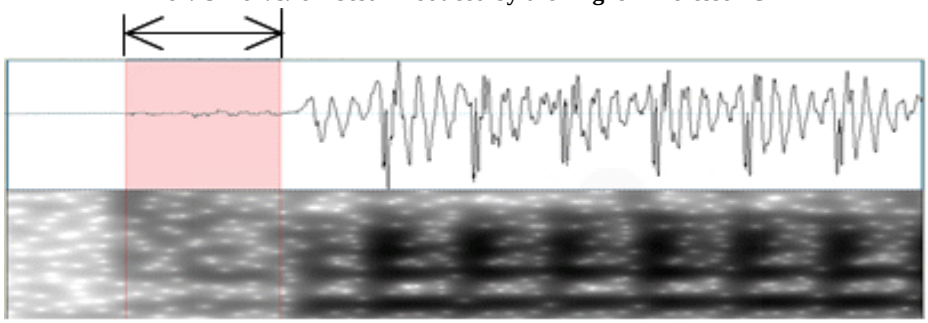
The participants of Group A and Group B recorded the English words ‘best’, ‘desk’ and ‘get’. I measured voice onset time (VOT) of the word-initial stops of them. VOT is

교보문고 KYOBO Book Centre

the duration between release burst of a stop and the onset of the following vowel. I measured VOTs using waveforms. However, I checked both waveforms and spectrograms to determine released burst of the stops and onset of the following vowels.

First, I measured the VOT of the stops of the above words produced by a native-speaking English professor, CM, who corrected the pronunciations of Group A participants and also recorded the words for Group B participants to do self-correction of their pronunciations. The highlighted portion of Figure 1 represents the VOT of the word-initial /b/ of 'best' produced by CM. It is 13 ms (milliseconds).

FIGURE 1
The VOT of /b/ of 'best' Produced by the English Professor CM



1) Correction by the English Professor

The participants of Group A recorded the English words 'best', 'desk', and 'get' before they were corrected by the native-speaking English professor CM. The highlighted portion of Figure 2 represents the VOT of /b/ of 'best' produced by KYM of Group A. It is 23 ms, which is 10 ms longer than that of /b/ produced by the English professor CM. Figure 3 represents the VOT of /b/ of 'best' produced by KYM after he was corrected by the native-speaking English professor CM. It is 24 ms, which is almost the same as the one before he was corrected by CM.

The participants of Group A showed the same pattern for the English words 'best', 'desk', and 'get' used in the experiment. I checked the average and the standard variation of VOTs of the word-initial /b/, /d/, and /g/. Table 2 shows them. I also checked whether there was significant difference between the VOTs of the stops before and after they were corrected by the English professor using a paired t-test based on degree of freedom of 22 and alpha level of 0.05. Table 3 shows them. The unit of VOTs in the tables is ms (milliseconds).

교보문고 KYOBO Book Centre

FIGURE 2
The VOT of /b/ of 'best' Produced by KYM of Group A before Correction by the English Professor

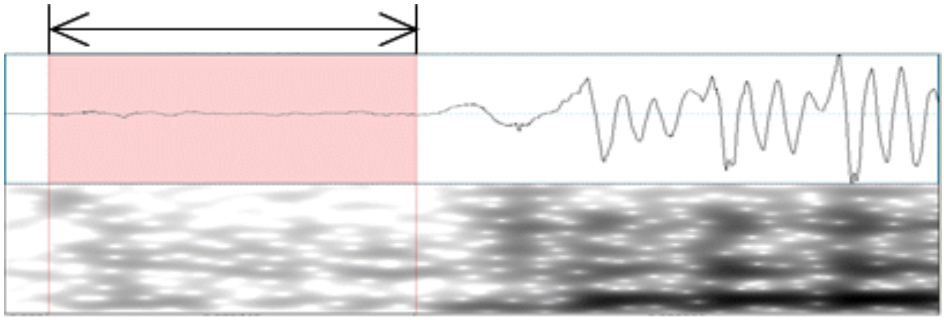
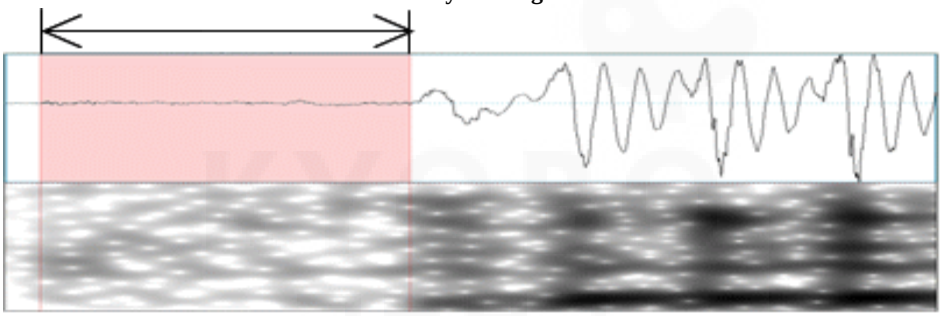


FIGURE 3
The VOT of /b/ of 'best' Produced by KYM of Group A after Correction by the English Professor



As shown in Table 2, the average VOT of /b/ was 27.04 ms before the Group A participants were corrected by the English professor, and it was shortened to 24.61 ms after they were corrected by him. But this change is not statistically significant as shown in Table 3 ($t = 0.703$, $p = 0.490$). The VOT of 24.61 ms after the correction is also very different from that of the English professor (13 ms).

The average VOT of /d/ produced by Group A was 21.48 ms before the correction and 19.30 ms after the correction, and it was not significant statistically. The average VOT of /g/ was also 36.57 ms before the correction and 32.30 ms after the correction, and this change was not significant statistically. The native-speaking English professor's VOTs for /d/ and /g/ were 10 ms and 15 ms, respectively. The Group A participants' VOTs of them were very different from those of Korean.

교보문고 KYOBO Book Centre

TABLE 2
Average and Standard Deviation of VOTs before and after Correction of Group A Participants by the English Professor

Voiced Stops	Words	Average of VOTs		Standard Deviation of VOTs	
		Before Correction	After Correction	Before Correction	After Correction
/b/	best	27.04	24.61	20.916	15.120
/d/	desk	21.48	19.30	20.111	16.921
/g/	get	36.57	32.30	15.403	12.338

TABLE 3
Statistics of VOTs before and after Correction of Group A Participants by the English Professor

Voiced Stops	Words	t-test	Probability	Significance
/b/	best	0.703	0.490	Not Significant
/d/	desk	1.545	0.137	Not Significant
/g/	get	1.615	0.121	Not Significant

Based on Table 2, Table 3, Figure 2, and Figure 3, I cannot say that the pronunciation correction by the native-speaking English professor was not statistically verified. Then how about the self-correction method using recorded English words, which is the most common pronunciation learning method Koreans use. I will check the effects of that method in the following section.

2) Self-correction by Koreans

The participants of Group B for this experiment were 23 college students. They were different from Group A since the purpose of the experiments should not be noticed by the participants. They also recorded the English words ‘best’, ‘desk’, and ‘get’ before they self-corrected their pronunciations using these words recorded by the same native-speaking English professor CM. Then they recorded these words again after they did self-corrections. Figure 4 and Figure 5 shows the VOTs of /b/ of ‘best’ produced by the participant ODH of Group B before and after the self-correction, respectively.

The VOT of /b/ of ‘best’ was 20 ms before the self-correction and it was 21 ms after the self-correction, and hence the change was not noticeable. They were also very different from that the native-speaking English professor CM (13 ms). Therefore, the self-correction does not seem to work. Table 4 shows average VOTs and their standard

교보문고 KYOBO Book Centre

deviations of the word-initial voiced stops before and after the self-correction. Table 5 shows paired t-test results based on degree of freedom of 22 and alpha level of 0.05. The unit of VOTs is milliseconds.

FIGURE 4

The VOT of /b/ of 'best' Produced by ODH of Group B before Self-correction

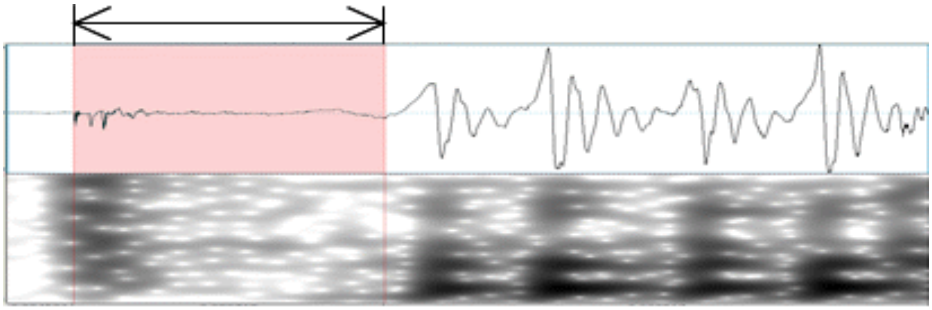
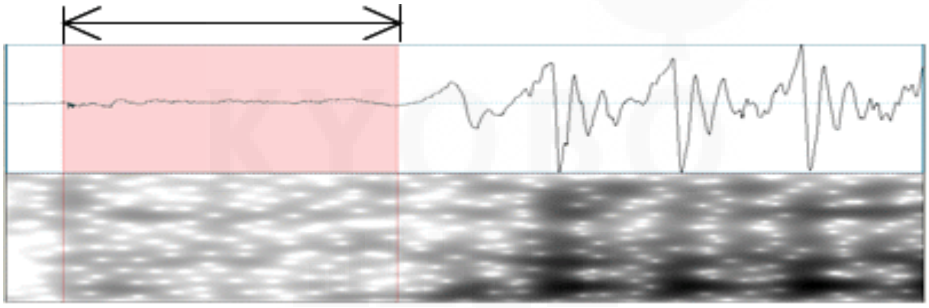


FIGURE 5

The VOT of /b/ of 'best' Produced by ODH of Group B after Self-correction



As Table 4 shows, the average VOT of /b/ was 25.43 ms before the self-correction and 23.21 ms after the self-correction. Since the change was not very different, the self-correction does not seem to work. The average VOTs of /d/ and /g/ were also not very different before and after the self-correction.

Table 5 shows that the change of the VOT of /b/ before and after the self-correction was not statistically significant. Thus I cannot say that Koreans can correct their pronunciation of word-initial voiced stops by repeating recorded words and self-correcting their pronunciations. The changes of VOTs of /d/ and /g/ were also not significant statistically.

교보문고 KYOBO Book Centre

TABLE 4

Average and Standard Deviation of VOTs before and after Self-correction of Group B Participants

Voiced Stops	Words	Average of VOTs		Standard Deviation of VOTs	
		Before self-correction	After Self-correction	Before Self-correction	After Self-correction
/b/	best	25.43	23.21	13.764	12.501
/d/	desk	20.57	19.17	14.230	12.691
/g/	get	28.70	28.61	17.226	18.403

TABLE 5

Statistics of VOTs before and after Self-correction of Group B Participants

Voiced Stops	Words	t-test	Probability	Significance
/b/	best	1.139	0.267	Not Significant
/d/	desk	1.507	0.146	Not Significant
/g/	get	0.048	0.962	Not Significant

In conclusion, the effects of both methods were not verified statistically. Thus I cannot say that the correction by a native-speaking English professor works for English voiced stops. Also I cannot say that Koreans can self-correct their English voiced stops.

III. EXPERIMENT ON WORD DURATIONS

In this experiment I will compare the effects of word duration changes using the two pronunciation learning methods. The participants and the native-speaking English professor are the same as the previous experiment. The recording procedures for the experiment are also the same as the previous experiment.

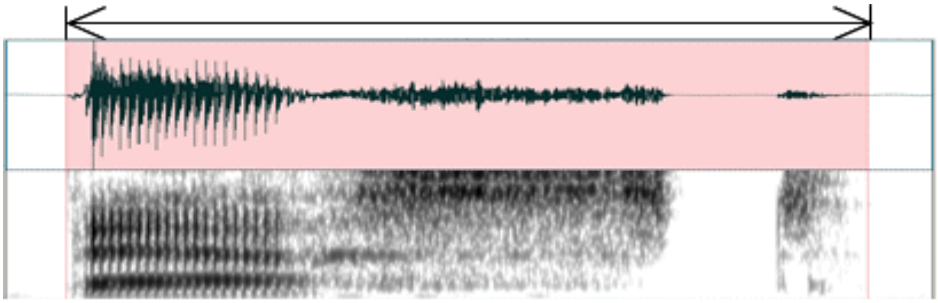
1. Results and Discussion

For the duration of the English word ‘best’, I chose to measure the released burst of /b/ as the start of the word. Although the stop closure of /b/ before the release burst is a part of the word, I excluded it since it is technically silence in citation forms of words such as the words recorded in the current experiment, and hence there is no clear distinction between the stop closure and a pause before the words. I set dynamic range to 60 dB in Praat and measured from the release burst of the word-initial /b/ to the aspiration portion of the word-final /t/ by checking both waveforms and spectrograms.

교보문고 KYOBO Book Centre

FIGURE 6

Duration of 'best' Produced by the English Professor CM



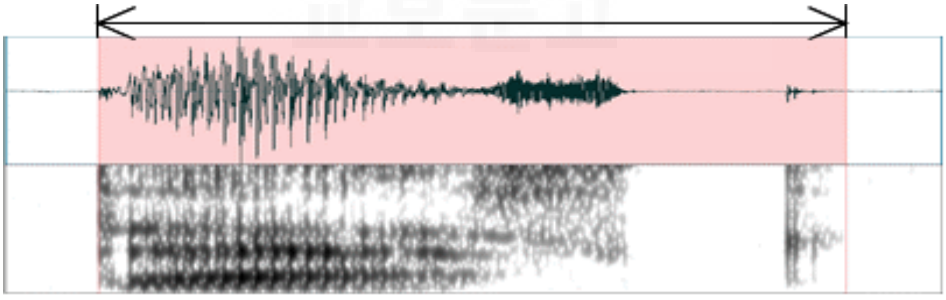
The highlighted portion of Figure 6 represents the duration of the English word 'best' produced by the native-speaking English professor CM. The duration was 665 ms.

1) Correction by the English Professor

The participants of Group A recorded the English words 'best', 'desk', and 'get' before their pronunciations were corrected by the native-speaking English professor CM. Figure 7 shows the duration of 'best' produced by the participant HJH of Group A.

FIGURE 7

Duration of 'best' Produced by HJH of Group A
before Correction by the English Professor CM



The duration of 'best' in Figure 7 was 399 ms. It is very short comparing with that of the native-speaking English professor (665 ms). I assume that this is due to the difference of syllable structures of English and Korean. In Korean only one consonant is allowed in coda position. For instance, /na/ 'me' and /nal/ 'day' form one syllable. However, /talk/ 'hen' is pronounced /tak/. When a vowel /i/ is followed, the /l/ is

교보문고 KYOBO Book Centre

pronounced, and hence /tal.ki/. The English word ‘best’ has /st/ in coda position, which is not allowed in Korean syllables. Especially the final /s/ is not allowed because of the so-called coda neutralization found in Korean phonology. For instance, both /nas/ ‘sickle’ and /nat/ ‘individual/separate’ are pronounced /nat/ due to the neutralization to /t/ in the coda position. Perhaps the duration of /st/ corresponds to that of a single consonant in HJH’s pronunciation. Therefore the Korean participant HJH did not produce long /st/. Comparing with Figure 6, the duration of /s/ produced by the native-speaking English professor is almost twice of the preceding vowel. However, that produced by HJH is about one third of the preceding vowel. This difference caused the big difference of durations of the word ‘best’ produced by the native-speaking English professor CM and the Korean participant HJH.

FIGURE 8
Duration of ‘best’ Produced by HJH of Group A After Correction by the English Professor CM

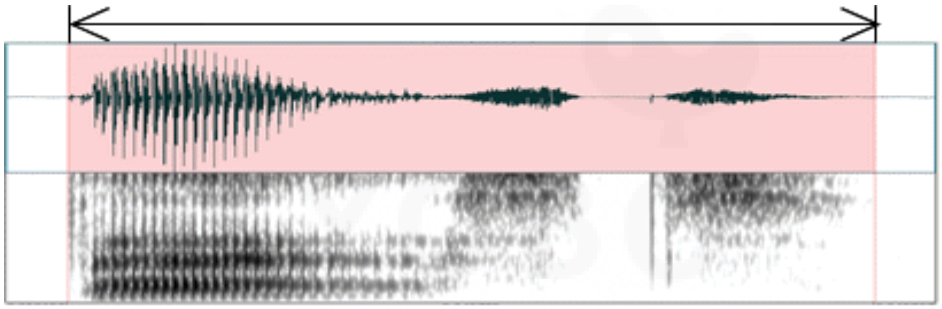


Figure 8 represents the duration of ‘best’ produced by HJH after he was corrected by the native-speaking English professor. The duration was 644 ms. This is very close to that of the native-speaking English professor (665 ms). Thus the correction method seems to work. In Figure 8 the duration of the vowel and the final /t/ were lengthened but the /s/ was still short and almost the same as before. I assume that the prohibition of /s/ in coda of Korean syllables affected HJH’s pronunciation.

The Group A participants showed similar effects for the English words ‘best’, ‘desk’, and ‘get’. Table 6 shows average word durations and their standard deviations before and after they were corrected by the native-speaking English professor CM. I did paired t-test with degree of freedom of 22 and alpha level of 0.05 to check whether the duration changes were statistically verified. Table 7 shows the statistical results. The unit of the duration is milliseconds in the tables.

교보문고 KYOBO Book Centre

TABLE 6

Average and Standard Deviation of Word Durations before and after Correction of Group A Participants by the English Professor

Words	Average of Durations		Standard Deviation of Word Durations	
	Before Correction	After Correction	Before Correction	After Correction
best	556.91	637.26	69.381	30.611
desk	554.61	665.35	75.183	37.989
get	202.17	253.43	34.602	15.605

TABLE 7

Statistics of Word Durations before and after Correction of Group A Participants by the English Professor

Words	t-test	Probability	Significance
best	-5.430	0.001	Significant
desk	-7.203	0.001	Significant
get	-6.118	0.001	Significant

Table 6 shows that the duration of 'best' was 556 ms before the native-speaking English professor corrected the Koreans, and it was changed to 637 ms after the correction and became very close to that of Enlgish professor (665 ms). This change is also statistically significant as shown in Table 7 where the probability is lower than the alpha level. Therefore the duration change of 'best' proves that the correction method by the native-speaking English professor is effective.

The results for the word 'desk' also shows similar effects. The native-speaking English professor's 'desk' was 699 ms long. The average duration of the word by the Group A participants was changed from 554 ms to 665 ms. Thus the duration became closer to that of the native-speaking English professor. This change was also statistically significant as shown in Table 7.

In the case of the word 'get', the coda position has only one consonant and it is /t/. It is also noticeable that the native-speaking English professor produced an unreleased stop /t/ like Koreans do for Korean words such as /pat/ 'field/farm'. In other words the syllable structure of the English word 'get' is also allowed in Korean. The duration of 'get' produced by the native-speaking English professor was 257 ms. The Group A participants' average duration was 202 ms before the correction and changed to 253 ms after the correction. Thus it became almost the same as that of the native-speaking English professor. This change was also statistically significant according to Table 7. Comparing with the results for 'best' and 'desk', the change of 'get' was much closer to

교보문고 KYOBO Book Centre

that of the native-speaking English professor. Perhaps the syllable structure similarity is responsible for this phenomenon.

Based on the results explained above, the correction method works at least for word durations although it does not work for VOTs of stops.

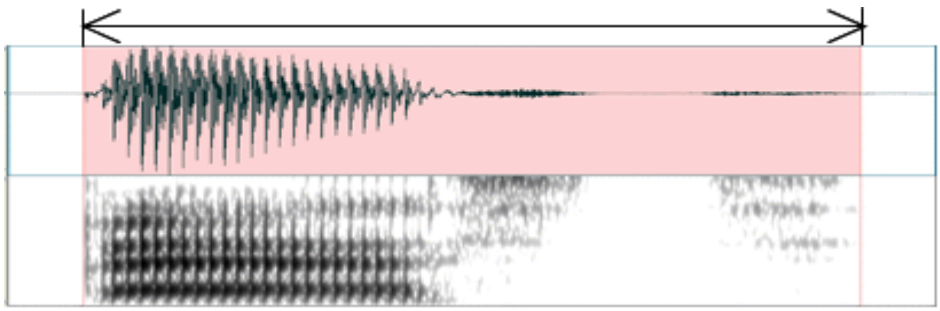
2) Self-correction by Koreans

Group B students participated in this experiment. The participants also recorded the English words ‘best’, ‘desk’, and ‘get’ before they self-corrected their pronunciations. Then they repeated the recorded English words and self-corrected their pronunciations. Figure 9 and Figure 10 show the durations of the word ‘best’ before and after the participant KHK of Group B self-corrected his pronunciation.

In Figure 9 the duration of ‘best’ produced by KHK is 511 ms. It is much shorter than that produced by the native-speaking English professor (665 ms). The /s/ portion is especially short comparing with that by the native-speaking English professor. I assume that this is due to the influence of the Korean syllable structure as I explained before. The duration of ‘best’ after the self-correction was 636 ms, which is shown in Figure 10, and hence became close to that by the native-speaking English professor. Thus the self-correction method seems to work. It is noticeable that the /t/ portion became longer after the self-correction but the /s/ is still almost the same. This phenomenon is also found in Group A participants’ results. Therefore, the production of ‘best’ by both Group A and Group B was influenced by the Korean syllable structure, and hence their pronunciation of /s/ was short.

FIGURE 9

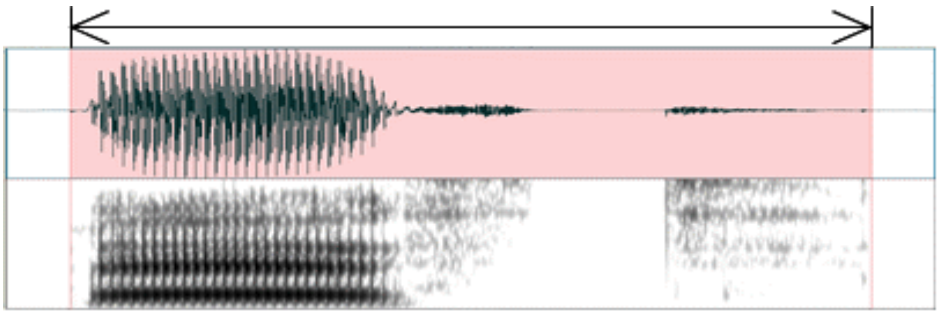
Duration of ‘best’ Produced by KHK of Group B before Self-correction of his Pronunciation



교보문고 KYOBO Book Centre

FIGURE 10

Duration of 'best' Produced by KHK of Group B after Self-correction of his Pronunciation



The Group B participants showed similar effects for the English words 'best', 'desk', and 'get'. Table 8 shows that the average durations and their standard deviations of the words produced by the Group B participants. Table 9 shows paired t-test results based on degree of freedom of 22 and alpha level of 0.05. The unit of durations in tables is milliseconds.

As shown in Table 8, the duration of 'best' was 523 ms before the Group B participants self-corrected their pronunciations, and became 656 ms after the self-correction, which was close to that of the English professor (665 ms). This change is also proved to to be statistically significant in Table 9. Thus the self-correction method seems to work. The similar pattern is found in the case of 'desk'. The duration of 'desk' by the English professor was 699 ms, and the duration of it by the Group B participants was changed from 566 ms to 679 ms, which was close to that of the English professor. This change is also statistically significant as shown in Table 9.

TABLE 8

Average and Standard Deviation of Word Durations before and after Self-correction of Group B Participants

Words	Average of Durations		Standard Deviation of Word Durations	
	Before Self-correction	After Self-correction	Before Self-correction	After Self-correction
best	523.43	656.83	49.788	57.612
desk	566.43	679.30	62.415	51.921
get	206.00	254.57	20.576	17.929

교보문고 KYOBO Book Centre

TABLE 9
Statistics of Word Durations before and after Self-correction of Group B Participants

Words	t-test	Probability	Significance
best	-10.578	0.001	Significant
desk	-7.057	0.001	Significant
get	-8.980	0.001	Significant

In the case of the English word 'get', the native-speaking English professor produced it with the duration of 257 ms. The average duration of this word by the Group B participants was 206 before the self-correction and was changed to 254 ms after the self-correction, which was close to that of the native-speaking English professor. This change is proved to be statistically significant as shown in Table 9. As I explained before, this is because the syllable structure of the English word 'get' is also allowed in Korean. Since the word 'get' has only one consonant in coda position, and hence the word duration became much closer to that of the native-speaking English professor after the self-correction.

Therefore, based on the current findings mentioned so far, I can say that both the correction by the native-speaking English professor and the self-correction method work for word durations.

IV. CONCLUSION

In the current study I compared two most common pronunciation learning methods. One is the correction by a native-speaking English professor as typically used in English conversation classes. The other is self-correction as second language learners typically do by repeating recorded words and correcting their pronunciations using a CD or an audio tape. I found that both methods showed similar effects. They were effective in the case of word durations but were not effective in the case of word-initial voiced stops. Thus short term correction methods used in the current study work only for word durations.

Yun and Lee (2013) conducted a production experiment on word-initial voiced stops produced by Koreans. They compared pronunciation correction by a native-speaking English professor and that by a Korean phonetics professor. The latter provided phonetic explanations on English voiced stops. However, both correction methods did not work. I assume that the reason why English voiced stops are difficult to learn is because of

교보문고 KYOBO Book Centre

phonological structure of Korean. In Korean word-initial stops 'ㅂ', 'ㄷ', and 'ㄱ' are voiceless stops, which influences Korean learners' pronunciations of English word-initial voiced stops. Perhaps they are rarely corrected using short term correction methods. Thus we should consider a long term correction method. For instance, we keep recording the words that contain word-initial stops for a semester, and compare them with the ones produced by a native speaker of English, and analyze them using a speech analysis program. We do this process over and over until Koreans' pronunciations became similar to those of English speakers. We should also consider perception experiments in addition to training Koreans as Al-Jarf (2005) and Park (2014) did.

As we have seen in previous researches, a second language learner' native language influences his or her production of second language sounds. In the current study, I found that the /s/ in the English words 'best' and 'desk' is not allowed in Korean syllables. Thus the participants lengthened the vowels and the final stops of these words to pronounce the words longer than their pronunciations were corrected, but the /s/ portion was not lengthened. This finding explains the influence of the Korean syllable structure.

REFERENCES

Al-Jarf, Reima Sado. (2005). The effects of listening comprehension and decoding skills on spelling achievement of EFL freshman students. *English Language & Literature Teaching*, *11(2)*, 35-50.

Best, Catherine. (1995). A direct realist view of cross-language speech perception. In W. Strange (Ed.), *Speech perception and linguistic experience: Issues in cross-language research* (pp. 171-204). Baltimore, MD: York Press.

Boersma, Paul., & Weenik, David. (2009). *Praat: Doing phonetics by Computer*. Retrieved May, 2009, from the World Wide Web: http://www.praat.org.

Flege, James. (1995). Second language speech learning theory, findings, and problems. In W. Strange (Ed.), *Speech perception and linguistic experience: Issues in cross-language research* (pp. 233-277). Baltimore, MD: York Press.

Kim, Ji-Eun. (2009). An acoustic study of English pronunciation correction based on the English pronunciation teaching materials. *Language Research, 25(3)*, 69-84.

Kim, Ji-Eun. (2010). Korean speakers' pronunciation and pronunciation training of English stops. *Journal of the Korean Society of Speech Sciences, 2(3)*, 29-36.

Kim, Ki-sub. (2002). *Acoustic analysis and English pronunciation teaching*. Seoul: Hankuk Munhwasa.

Lado, Robert. (1957). *Linguistics across cultures*. Ann Arbor: University of Michigan Press.

교보문고 KYOBO Book Centre

Park, Misook. (2014). A study on Korean middle school students' recognition of the correlation between English vowel spelling and pronunciation: Focused on [ɔ], [au], [ou]. *English Language & Literature Teaching*, *20(3)*, 257-273.

Schmidt, Anna M. (1996). Cross-language identification of consonants, Part 1. Korean perception of English. *Journal of the Acoustical Society of America*, *99(5)*, 3201-3211.

Yun, Yungdo. (2005). Korean listeners' perception of English /i/, /I/, and /ɛ/. *Speech Sciences*, *12(1)*, 75-87.

Yun, Yungdo. (2009). Identification of English vowels /u/-/U/ by English and Korean speakers. *The Journal of Modern British & American Language & Literature*, *27(4)*, 241-253.

Yun, Yungdo. (2009). Response time and identification of English high front vowels. *The Journal of Modern British & American Language & Literature*, *29(3)*, 1-19.

Yun, Yungdo. (2011). English and Korean listeners' response time to low and mid-low front vowels. *Studies in English Language & Literature*, *55(1)*, 177-190.

Yun, Yungdo & Lee, Narae. (2012). Research on the effect of pronunciation training of English unaspirated stops for Koreans. *Language and Linguistics*, *57*, 141-158.

Yun, Yungdo & Lee, Narae. (2013). Research on English voiced stops and lax vowels produced by Koreans. *Language and Linguistics*, *61*, 81-110.

Examples in: English
Applicable Languages: English
Applicable Levels: Secondary

Yungdo Yun
Dharma College
Dongguk University
30 Pildong-ro 1-gil, Jung-gu
Seoul 100-715, Korea
Tel: 02-2260-8616 CP: (010)-9474-8320
Fax: 02-2260-3886
Email: yungdoyun@dongguk.edu

Received in October 15th, 2014
Reviewed in November 26th, 2014
Revised version received in December 5th, 2014

교보문고 KYOBO Book Centre