

From Another Angle: Comparisons of the Voice Onset Time of English Voiceless Plosives between Korean Speakers and American Speakers

Kwanyoung Oh

Division of International Studies, Chonnam National University

okyoung@chonnam.ac.kr

Abstract

This study investigated Voice Onset Time (VOT) of an English plosive in American and Korean speakers, because the VOT value is regarded as representing the proficiency of English speakers and also shows the fluency of English for Koreans. In comparisons of VOT value in Americans and Koreans, first, in the case of meaningless words, the difference of VOT between Americans and Koreans is significant. Second, in the three different environments, the significance is found only in 'pos_cda_ons'. Finally, the comparison of the first case and the second one shows significance in 'ta-in_voc_ons' and 'ta-pos_cda_ons' (Americans), and 'ta-wrd_initial' (Koreans). Therefore, we can see that Koreans pronounced a consistent pattern of the English plosive unlike Americans.

Keywords

alveolar stop, VOT, duration, aspiration

1 Introduction

The purpose of this study is to identify the major causes of differences in VOT through a comparison between Korean and American speakers. The reason this study has a concern about VOT is as follows: First, it is said that a foreign accent is closely related to VOT, and an accent like native speakers of English is deeply dependent on proficiency of VOT (Major 1987:201). Second, one thing that is well known to us is that the plosives in Korean are differentiated by tense and aspiration, but in English they are discriminated by VOT, especially in voicing contrast. If so, we have a question about what difference Korean learners of English will show in VOT value in comparison with American speakers. For this, first, we will consider the difference of VOT in a set of meaningless words between Americans and Koreans in one group. Second, we identify what difference in VOT there is depending on three different environments using real words and phrases between Americans and Koreans in another group. Third, through comparisons between Americans and Koreans, we would like to confirm

that the period of English education between the two Korean groups will show a difference of VOT value.

2 Assumption

First, Korean plosives are all voiceless and discriminated not by voicing, but by aspiration and tense. We say that VOT is a phonetic parameter to exhibit the voicing contrast of plosives in English. Therefore, something we definitely predict is that there will be a big difference between Americans and Koreans in the two groups in terms of the duration of VOT.

Second, in general, if we presuppose that the period of education in English is be closely related with fluency in English, the second group of Koreans who are experimented on later can be similar to Americans in the group in terms of duration of VOT.

3 Analyses

For the comparison of VOT analyses of American and Korean speakers, at first I examine the results of an experiment performed with meaningless words on 20 speakers of one group (Oh 2010). In the process I compare the average difference of VOT value between Americans and Koreans. Next, I consider the average VOT value in real words and phrases on 20 speakers in the other group (Oh 2016).

3.1 Environments

First, I compare the VOT value of Americans and Koreans in meaningless words. Second, I consider the VOT value of the two groups in three different types of environments. Third, I compare whether the VOT value in the meaningless words is related to the one of English real words and phrases. The reason I compare the first and second experimental results is to confirm the reciprocal relationship between the period of English education and VOT value in Koreans.

3.2 VOT-differences between Americans and Koreans

Tables 1, 2, and 3 show the averages of VOT in the meaningless words, three different contexts, and reciprocal contexts in Americans and Koreans.

Table 1: VOT comparison of speakers in *pa-ta-ka*

| Contexts | Sub. | Aver. | S.D. | T | P |
|----------|------|-------|-------|-------|-------|
| pa | Am | 92.84 | 31.63 | 5.335 | 0.000 |
| | Kor | 55.89 | 20.95 | | |
| ta | Am | 91.68 | 29.16 | 5.893 | 0.000 |
| | Kor | 54.26 | 18.95 | | |
| ka | Am | 98.01 | 29.38 | 4.878 | 0.000 |
| | Kor | 64.78 | 23.01 | | |

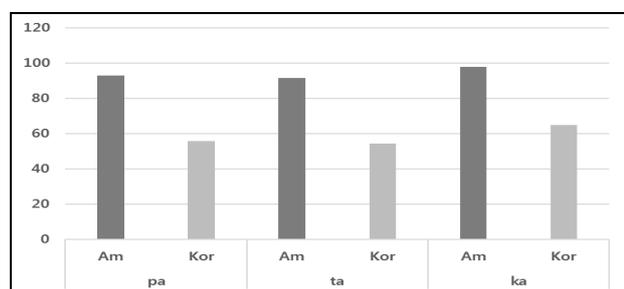


Figure 1: VOT comparison in *pa-ta-ka*

Table 2: VOT comparison in three contexts

| Contexts | Sub. | Aver. | S.D. | T | P |
|-------------|------|-------|-------|---------|-----------|
| int_voc_ons | Am | 63.90 | 16.77 | 2.2102 | 0.8359 |
| | Kor | 62.23 | 18.62 | | |
| pos_cda_ons | Am | 42.70 | 6.76 | -4.1107 | 0.0006564 |
| | Kor | 60.49 | 11.90 | | |
| wrд_initial | Am | 73.21 | 11.90 | 0.3687 | 0.7166 |
| | Kor | 71.39 | 10.09 | | |

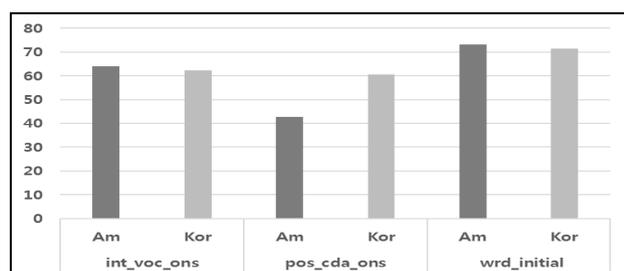


Figure 2: VOT comparison of speakers in three contexts

Table 3: VOT reciprocal comparison in two contexts

| Contexts | Sub. | Aver. | S.D. | T | P |
|----------------|------|-------|-------|--------|-----------|
| ta-in_voc_ons | Am | 91.68 | 28.24 | 2.6747 | 0.01546 |
| | Am | 63.90 | 16.77 | | |
| | Kor | 54.26 | 18.02 | -0.973 | 0.3434 |
| | Kor | 62.23 | 18.62 | | |
| ta-pos_cda_ons | Am | 91.68 | 28.24 | 5.3336 | 4.536E-05 |
| | Am | 42.70 | 6.76 | | |

| | | | | | |
|----------------|-----|-------|-------|---------|---------|
| | Kor | 54.26 | 18.02 | -0.9123 | 0.3737 |
| | Kor | 60.49 | 11.89 | | |
| ta-wrd_initial | Am | 91.68 | 28.24 | 1.906 | 0.07275 |
| | Am | 73.21 | 11.90 | | |
| | Kor | 54.26 | 18.02 | -2.6222 | 0.01727 |
| | Kor | 71.39 | 10.09 | | |

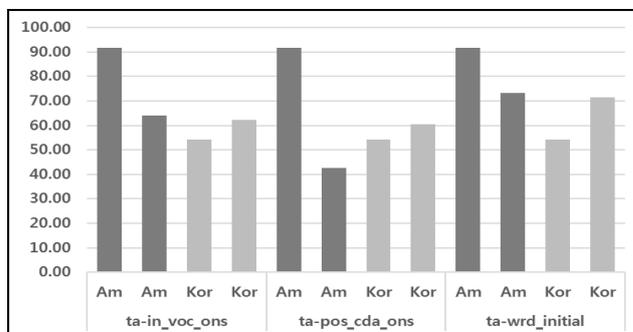


Figure 3: Total results of VOT comparison

4 Results and Discussion

With the comparisons, the results have provided some insights in pronunciation of Koreans as follows:

- In the meaningless words, Americans and Koreans show a big difference of VOT value, and the average (ms) of Americans was longer than Koreans.
- In the comparison of three contexts, Americans and Koreans pronounced similarly except 'pos_cda_ons'.
- In the reciprocal comparisons of the previous two contexts, there was a significant difference 'pos_cda_ons' and 'ta-in_voc_ons' among Americans, but 'ta_wrd_initial' among Koreans. This can mean that Koreans consistently pronounced the English plosive similarly regardless of the position in which the plosive occurred.

References

- Ladefoged, P. (2006). *A Course in Phonetics* 5th. Thomson Wadsworth.
- Major, Roy, C. (1987). English Voiceless Stop Production by Speakers of Brazilian Portuguese. *Journal of Phonetics* 15, 197-202.
- Oh, K. Y. (2010). An Experimental Study of Articulatory Similarities and a Searching Examination of the Cues of Sound Recognition Differences through a Sound Analysis of English Consonants. *Korean Journal of Linguistics*, 35(3), 703-742.