Production of English Vowels by Korean English learners: Vowels in a Reading Passage and Isolated Sentences

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Abstract: The purpose of this study was to investigate how Korean English learners produce English front vowels differently in a reading passage and isolated sentences. Eleven Korean learners produced the front vowels [i, ɪ, ɛ, æ] embedded in the provided texts. The first and second formant values (F1 and F2) and vowel durations were analyzed using the Speech Analyzer program. The results showed that (1) Korean English learners have more difficulty producing English front vowels in a reading passage than isolated sentences; (2) In isolated sentences, the distance of the high front vowels [i] and [ɪ] produced by Korean learners is shorter than that of native English speakers; (3) From the reading passage, they could not distinguish front vowels [i] and [ɪ] and low front vowels [ɛ] and [æ] correctly. Based on these results, the pedagogical implications were discussed.

Keywords: English front vowels, formant values, reading passage, isolated sentences, Korean English learners

1 Introduction

This study investigates the production of two tense and lax pairs of English vowels: the [i] / [ɪ] and [ɛ] / [æ] pairs. It is already well known that Korean learners struggle to produce the distinctions between these vowels since there is no tense lax distinction in Korean (Bohn & Flege, 1990; Ingram & Park, 1997; Yang, 1996; Yang, 2008). However, it is difficult to find studies that compare vowel production from a reading passage and isolated sentences by the same participants. In real life, the chance to read or speak a passage is greater than that of isolated sentences. Hence, for the sake of analysis, both formats are worthy of investigation. Therefore, this study examines English learners’ production of vowels from both a reading passage and isolated sentences.
2 Method

Eleven Korean males participated in this study. They were aged between 19 and 22, born in Korea, and have not lived in an English-speaking country for more than 3 months. They were asked to recite a reading passage. Figure 1 shows underlined words including the target vowels (stressed vowels). The participants were also asked to read isolated sentences containing words with the h(V)d (e.g., heed, hid, head, and had), b(V)d and b(V)t sounds. These target words were embedded in the sentence template, “Say ______ for me.”

![Reading passage including target vowels](image)

For the acoustic analysis, the vowel formants (F1 and F2) values and duration were measured using Speech Analyzer (Figure 2).

![Measuring F1 and F2 values using Speech Analyzer](image)

3 Results

Table 1 shows the mean F1 and F2 values and duration of vowels in isolated sentences. When these values are compared with those of native English speakers, we can notice that the distance of the high front vowels [i] and [ɪ] produced by Korean learners is shorter. In addition, the distance of front vowels [i] and [æ] uttered by
Koreans is shorter than that of native speakers. The comparative native speaker data (isolated sentences) was taken from Kim (2010).

Table 1. The mean F1 and F2 values (Hz) and duration (ms) in isolated sentences

<table>
<thead>
<tr>
<th>vowel</th>
<th>F1(sd)</th>
<th>F2(sd)</th>
<th>duration(sd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[i]</td>
<td>321(51.3)</td>
<td>2230(203.6)</td>
<td>117 (43.2)</td>
</tr>
<tr>
<td>[ɪ]</td>
<td>340(53.9)</td>
<td>2098(224.2)</td>
<td>100 (32.8)</td>
</tr>
<tr>
<td>[ɛ]</td>
<td>473(159.7)</td>
<td>1944(282.0)</td>
<td>143(49.8)</td>
</tr>
<tr>
<td>[æ]</td>
<td>558(79.7)</td>
<td>1727(215.0)</td>
<td>124(37.4)</td>
</tr>
</tbody>
</table>

Fig. 3. Vowel spaces of native English speakers (Kim, 2010) and Korean learners (isolated sentences): from top to bottom, [i, ɪ, ɛ, æ] in that order.

Table 2 shows the mean F1 and F2 values and duration of vowels in the reading passage. Here, we can notice that Korean learners cannot distinguish front vowels [i] and [ɪ] and low front vowels [ɛ] and [æ] correctly. When these values are compared with those of isolated sentences, we can notice that Korean students have more difficulty producing English front vowels from a reading passage than isolated sentences.

Table 2. The mean F1 and F2 values (Hz) and duration (ms) in a reading passage

<table>
<thead>
<tr>
<th>vowel</th>
<th>F1(sd)</th>
<th>F2(sd)</th>
<th>duration(sd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[i]</td>
<td>356(89.7)</td>
<td>1925(424.1)</td>
<td>77(37.4)</td>
</tr>
<tr>
<td>[ɪ]</td>
<td>421(519.7)</td>
<td>2129(268.7)</td>
<td>97(32.4)</td>
</tr>
<tr>
<td>[ɛ]</td>
<td>537(86.4)</td>
<td>1535(247.4)</td>
<td>122(40.7)</td>
</tr>
<tr>
<td>[æ]</td>
<td>562(96.4)</td>
<td>1653(145.1)</td>
<td>138(118.6)</td>
</tr>
</tbody>
</table>
4 Conclusion

This study shows that Korean English learners have more difficulty producing English front vowels in a reading passage than isolated sentences - even though produced by same participants. These results should be considered when conducting English pronunciation instruction with Korean learners. Differing from these types of isolated text, supra-segments such as intonation and accent should also be considered for reading passages.

References