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Effect of clear speaking style and lexical competitors

on the tense-lax vowel distinction in Korean-accented English

Speech production in monolingual populations is affected by clear speaking style (Picheny et al.,1986) and lexical factors, such as the existence of a direct lexical competitor for a given phonological feature (Baese-Berk & Goldrick, 2009). The present study investigates the effects of clear speaking style and lexical competitors on productions by non-native speakers - the population which received considerably less attention in the field. Specifically, we focus on the realization of English high front vowels [i] and [ɪ], which represent a tenseness contrast absent in Korean phonology.

Nine native monolingual English speakers and 14 native Korean speakers residing in the USA participated in the study. Each participant produced three repetitions of a word-list, in casual speaking style and in clear speaking style. 16 English words were used as stimuli: eight words were minimal pairs in terms of vowel tenseness (e.g. *beat* vs. *bit*); four additional words with a tense vowel had no lax vowel counterpart (e.g. *need* vs. **knid*); and four words with a lax vowel had no tense vowel counterpart (*pig* vs. **peag*). F1 and F2 formant values and duration of each vowel were measured. In the analysis, we compared the effects of speaking style and lexical competitor in native and non-native English speech. A number of significant effects and interactions in the Linear Mixed Model analyses were indicative of the following patterns.

Korean participants produced a greater distinction between tense and lax vowels in terms of duration, while native English speakers produced a greater distinction in terms of spectral properties: both F1 and F2. This finding agrees with previous work demonstrating that non-

native speakers of English tend to rely on vowel duration when implementing tense-lax distinction in English vowels, while native speakers rely primarily on spectral differences (Cebrian, 2006)

Additionally, vowels with lexical competitors demonstrated more extreme spectral values, both in terms of height and backness, than vowels without lexical competitors, suggesting contrast enhancement in the situation of potential confusability. This finding contributes to a small but growing body of findings demonstrating the effect of lexical competitors on the acoustic implementation of specific phonological properties in speech (Baese-Berk & Goldrick, 2009). The effect of competitors on vowel distinctiveness in terms of height was greater for native than non-native speakers, suggesting that lexical knowledge played a more important role in the acoustic realization of the tenseness contrast for those speaking their first language.

Finally, both durational and spectral contrast (F1) between tense and lax vowels was enhanced in clear speech compared to casual speech, across participant groups, extending to non-native population the observation that language-specific phonological contrasts tend to be enhanced in clear speech, which was previously established for native speakers (Picheny et al., 1986).

References

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