Perceptual adaptation to novel speech patterns: the effect of perceived talker identity

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Listeners adapt to foreign-accented speech even in a short period of time (e.g., [1, 2]), yet the interaction between the degree of adaptation and talker identity remains less explored. Do listeners show greater adaptation for nonnative talkers than native talkers? If so, does the alleged native language of the nonnative talker matter? This study investigates English listeners' adaptation to English words beginning on consonant clusters produced with an epenthetic vowel, examining if adaptation differs based on the talker identity.

English native listeners (19 M, 27 F, 3 others; age M = 27, SD = 8.76) participated in a lexical decision task. They were assigned to one of the three talker conditions (American: n = 17; Korean: n = 18; Mexican: n = 14), and heard 72 experimental items mixed with 120 fillers. The experimental items consisted of three different types, namely, 24 monosyllabic words beginning on an obstruent+liquid cluster (**word**, e.g., *club* [klʌb]), 24 pseudowords with the vowel [ʊ] inserted between the obstruent and the liquid (**[ʊ]-type,** e.g., [kʊˈlʌb]), and other 24 with the vowel [ɪ] inserted (**[ɪ]-type,** e.g., [kɪˈlʌb]). Epenthetic vowel [ʊ] is more plausible for a Korean talker than [ɪ] (e.g., [3]). Fillers included 48 words and 72 nonwords. The stimuli were recorded by a phonetically-trained male native English speaker from Indiana, US. Stimuli were presented one by one in three consecutive blocks in random orders. Upon the presentation of each stimulus, the listeners were asked to decide whether the it was an English word or not. Talker identity was manipulated using pictures (Figure 1) and the listeners were explicitly informed that the talker was either a native English speaker from the US, a nonnative speaker from Korea, or a nonnative speaker from Mexico. After completing the lexical decision task, the participants also rated their familiarity with Korean-accented and Spanish-accented English on a 7-point scale, which overall revealed greater familiarity with Spanish-accented English (M = 4.67, SD = 1.72) than with Korean-accented English (M = 3.20, SD = 1.76).

Listeners' lexical decision responses (yes-no) showed that the stimulus type (word, [ɪ]-type, [ʊ]-type) significantly influenced the listeners' responses (Figure 2). As expected, the word type was responded to as word more frequently ($\beta = 0.95$, $p < 0.001$) than both vowel insertion types across talker conditions. Also, [ʊ]-type yielded word responses more frequently than [ɪ]-type ($\beta = -0.34$, $p = 0.017$) across all talker conditions, showing a general preference for [ʊ]. Talker conditions, component consonants, and any interaction terms involving those were not significant.

To examine how listeners adapted to the two types of vowel insertion stimuli ([ɪ]-type and [ʊ]-type) over the course of the experiment, an additional analysis was conducted to compare the proportion of word responses between Block 1 and Block 3. In general, word responses for vowel insertion stimuli increased from Block 1 to Block 3, and more so for [ɪ]-type than [ʊ]-type ($\beta = -0.33$, $p = 0.010$). But, the results also revealed a significant talker effect. The [ʊ]-type stimuli showed a greater increase (indicating stronger adaptation) for Korean talker than Mexican ($\beta = -0.85$, $p = 0.047$) or American ($\beta = -1.11$, $p = 0.016$) talkers. The talker effect was marginal for the [ɪ]-type stimuli (Korean vs. Mexican: $\beta = -0.82$, $p = 0.064$; Korean vs. American: $\beta = -0.86$, $p = 0.080$) (see Figure 3).

These outcomes suggest that listeners' adaptation patterns differ not only between native vs. nonnative talkers but also based on the perceived native language of the nonnative talker. Adaptation to the vowel insertion tokens was greater when the listeners saw the Korean talker than the Mexican talker. As the listeners were more familiar with Spanish-accented English, they were presumably aware that it typically does not involve vowel epenthesis for the specific type of consonant clusters tested here. This could lead them to be less likely to adapt to such phonetic patterns for the Mexican talker than for the Korean talker. In sum, our study shows that listeners adapt to the same phonetic patterns differently according to perceived talker identity.

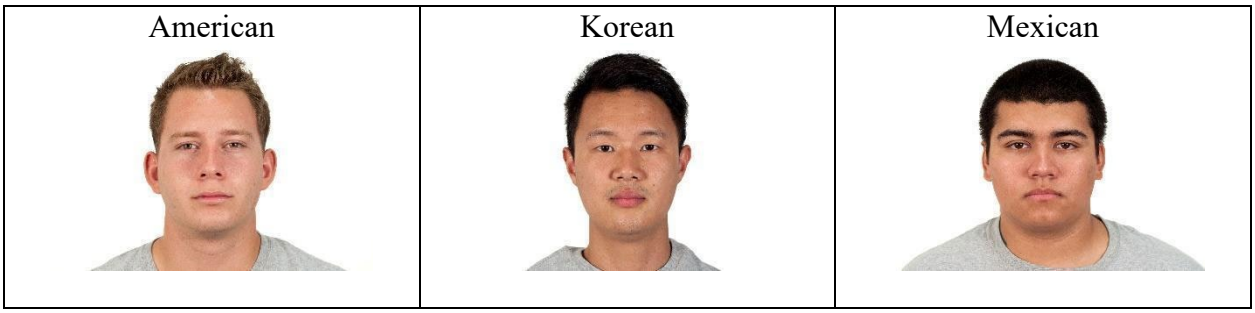

Fig. 1. Faces presented in each talker condition

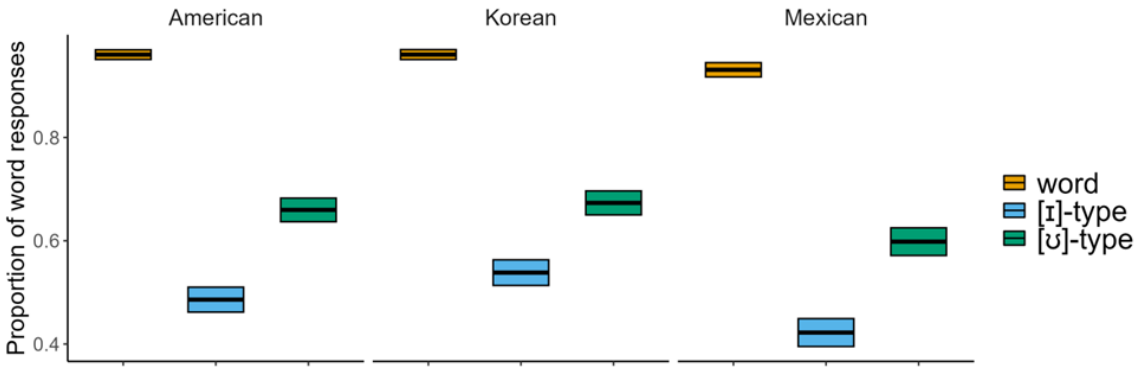

Fig. 2. Proportion of word responses in each talker condition and stimulus type

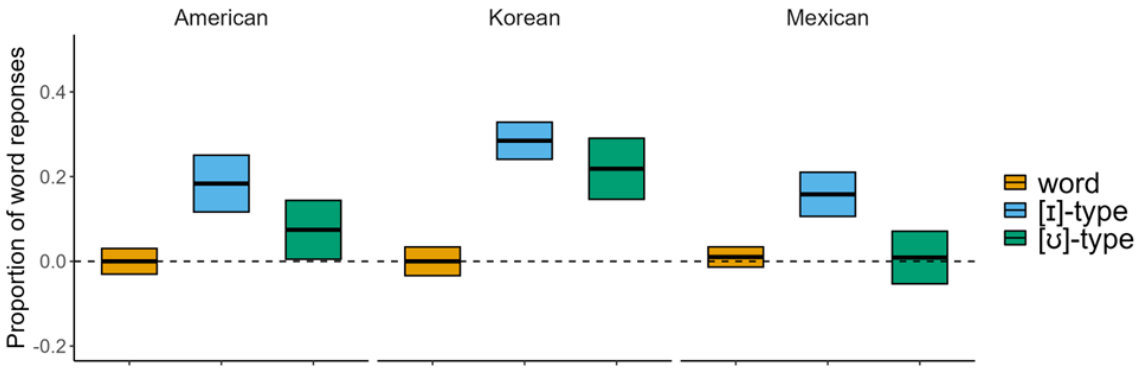

Fig. 3. Proportion differences in word responses between Block 1 and Block 3. Positive values indicate more word responses in Block 3

References

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