

Perceptual adaptation to novel speech patterns differs by talker identity

Jeonghwa Cho (University of Michigan), Harim Kwon (Seoul National University)

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 males, 27 females, 3 others; age $M = 27$, $SD = 8.76$) performed a lexical decision task. They were assigned to one of three talker conditions (American: $n = 17$; Korean: $n = 18$; Mexican: $n = 14$) and heard 72 experimental items mixed with 120 fillers (48 words and 72 nonwords) recorded by a male native English speaker. Experimental items consisted of 24 English monosyllabic words beginning on an obstruent+liquid cluster (e.g., *club* [kɪɫb]), 24 pseudowords with the vowel [ʊ] inserted (e.g., [kʊ'ɫb]), and other 24 with the vowel [ɪ] inserted (e.g., [kɪ'ɫb]). Epenthetic vowel [ʊ] is more plausible for a Korean talker than [ɪ] (e.g., [3]). Stimuli were presented in three consecutive blocks in random orders. Talker identity was manipulated using pictures (Fig.1) and the listeners were told that the talker was either a native English speaker from the US, a nonnative speaker from Korea, or a nonnative speaker from Mexico. Listeners also rated on a 7-point scale their familiarity to Korean-accented and Spanish-accented English, which revealed a greater familiarity to Spanish-accented English ($M = 4.67$, $SD = 1.72$) than to Korean-accented English ($M = 3.20$, $SD = 1.76$).

Listeners' lexical decision responses (yes or no) revealed that the stimulus type (word, [ɪ]-type, [ʊ]-type) significantly influenced the listeners' responses (Fig.2). The word type was responded to as word more frequently ($b = 0.95$, $p < 0.001$) than both vowel insertion types, as expected. Also, [ʊ]-type yielded more word responses than [ɪ]-type ($b = -0.34$, $p = 0.017$) across the three 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 adapt to the [ɪ/ʊ]-type stimuli over the course of the experiment, an additional analysis compared the proportion of word responses between Block 1 and Block 3. Word responses for vowel insertion stimuli increased from Block 1 to Block 3, and more for [ɪ]-type than [ʊ]-type ($b = -0.33$, $p = 0.010$). Korean talker showed greater increase for [ʊ]-type than Mexican ($b = -0.85$, $p = 0.047$) or American ($b = -1.11$, $p = 0.016$), and the talker effect was marginal for [ɪ]-type (Korean vs. Mexican: $b = -0.82$, $p = 0.064$; Korean vs. American: $b = -0.86$, $p = 0.080$) (Fig. 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. They showed greater adaptation to the vowel insertion tokens when they saw the Korean talker than the Mexican talker. As the listeners were more familiar with Spanish-accented English which they might be aware does not involve vowel epenthesis for consonant clusters, they were less likely to adapt to such phonetic pattern. In sum, our study shows that listeners adapt to the same phonetic patterns differently according to perceived talker identity.

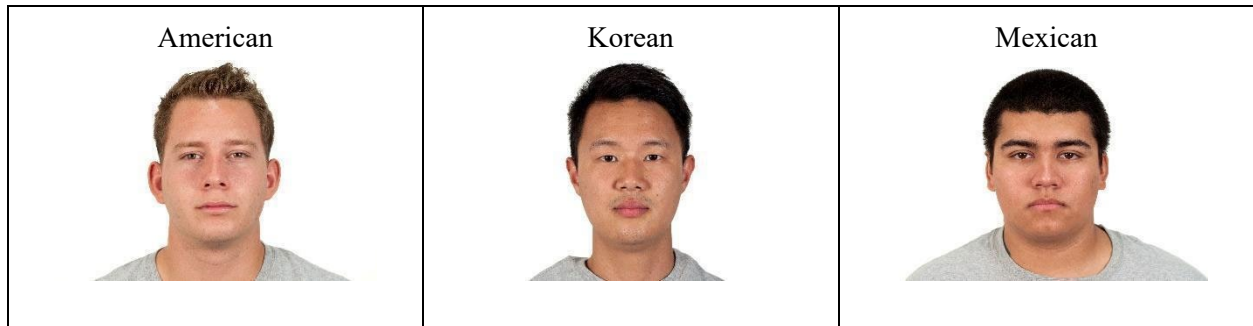


Figure 1. Faces presented in each speaker condition

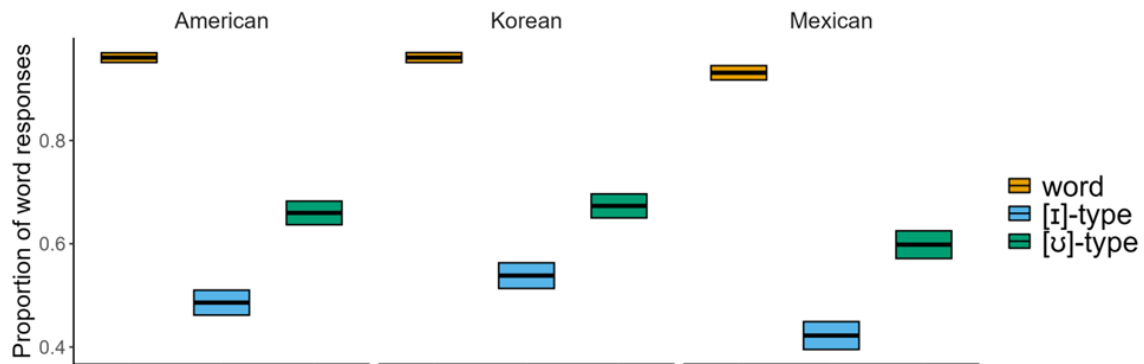


Figure 2. Proportion of word responses in each speaker condition and stimulus type.

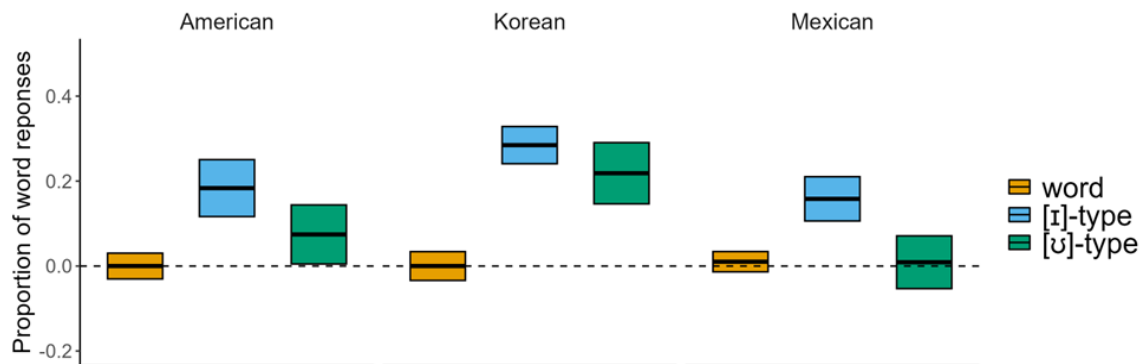


Figure 3. Proportion differences in word responses between Block1 and Block3. Positive values indicate greater percentage in Block3.

[1] Bradlow, A. R., & Bent, T. (2008). Perceptual adaptation to non-native speech. *Cognition*, 106(2), 707-729.

[2] Clarke, C. M., & Garrett, M. F. (2004). Rapid adaptation to foreign-accented English. *The Journal of the Acoustical Society of America*, 116(6), 3647-3658.

[3] Darcy, I., & Thomas, T. (2019). When blue is a disyllabic word: Perceptual epenthesis in the mental lexicon of second language learners. *Bilingualism: Language and Cognition*, 22(5), 1141-1159.