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## Lexical age of acquisition and phonological neighborhood density effects on foreigner-directed speech

Linguistic communication often involves inter-speaker accommodation. For example, the detection of foreign-accented speech by a native speaker might trigger multiple types of linguistic adjustment, ranging from syntactic simplification (Ferguson, 1975) to acoustic modifications such as increased vowel duration and segmental hyperarticulation (Scarborough et al., 2007; Uther et al., 2007). These modifications are generally accepted to facilitate speech perception. Lexical difficulty can also trigger acoustic modifications, as seen in the increased hyperarticulation of words from dense phonological neighborhoods (Munson and Solomon, 2004). In adult-directed speech (ADS), hyperarticulation is conditioned by phonological neighborhood density (ND), while it is conditioned by lexical Age of Acquisition (AoA) in infant-directed speech (IDS; Zellou & Scarborough, 2015). In foreigner-directed speech (FDS), it is not clear which lexical variables might play a role: a non-native speaker is an adult with a mature linguistic system, yet their L2 lexicon is still developing, like an L1 learner. The current study investigates the effect of AoA and ND on vowel duration and hyperarticulation in FDS. The results from 20 native English speakers, producing words in conditions designed to elicit FDS, suggest that speakers make similar acoustic modifications for foreign-accented speakers as they do for adults. In a repeated-measures ANOVA, words in FDS, compared to citation and casual speech conditions, were found to have increased vowel duration ( $p < .001$ ) and hyperarticulation ( $p < .001$ ), calculated as Mahalanobis distance. Across all speech conditions, words with a higher AoA, i.e., adult native English speakers rated these words as acquired later in life (Kuperman et al., 2012), were also produced with longer vowel durations than words with a lower AoA ( $p < .001$ ). Corroborating previous work on ADS, AoA was not a significant main effect for hyperarticulation. Words with a high ND (i.e. a greater number of phonological competitors), however, were produced with a longer vowel duration ( $p < .001$ ) and greater hyperarticulation ( $p < .001$ ), which coincides with previous studies on ADS, and differs from findings on IDS, in which ND did not condition hyperarticulation. Overall, in a laboratory setting, FDS is distinct from citation and casual speech by exhibiting increased vowel duration and hyperarticulation. There were no significant interactions between the elicited conditions and either AoA or ND. FDS therefore followed the same patterns of phonetic modifications due to lexical effects as exhibited in previous studies on ADS, rather than IDS.

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