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Exploring Phonological Levenshtein Distance Effects in Auditory Lexical Decision

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Abstract: Phonological similarity among spoken words is traditionally indexed by neighbourhood density (i.e., the number of words differing by a single phoneme from the target). However, density is of limited utility for long words, which have few or no neighbours. In this study, we explored the effects of phonological similarity and word-frequency on auditory lexical decision performance, using multisyllabic words with no neighbours and a new similarity metric called phonological Levenshtein distance (PLD20), which reflects the mean number of substitution, insertion, or deletion operations required to transform a word into 20 of its closest Levenshtein neighbours. Inhibitory effects of PLD20 were observed, where words with closer neighbours were recognised slower; importantly, these effects were present for only low-frequency words, replicating previous findings with other neighbourhood measures. The properties of PLD20 make it a promising new measure for quantifying the phonological distinctiveness of multisyllabic words in spoken word recognition research.