

# Perceptibility of vowel duration contrasts and dispersion in the English lexicon

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Perceptibility of phonological contrasts shapes the phonological system of a language: Phonological inventories (Flemming 2004) and phonological changes (Steriade 1997). The present study adds evidence in the same line: Perceptibility influences the structure of the mental lexicon, investigating whether more distinct contrasts are preferred over less distinct contrasts at the word level. In English CVC words there can be four degrees of phonetic vowel duration depending on the combination of phonemic vowel length (long, short) and voicing of the coda consonant (voiced, voiceless) (e.g. *bead-beat-bid-bit*): Long vowels followed by a voiced or voiceless coda (LD, LT), short vowels followed by a voiced or voiceless coda (SD, ST). Phonetically, the vowel duration is known to decrease in the order  $LD > SD \geq LT > ST$ . That is, the phonemically short vowel before a voiced coda (SD) is phonetically the same as or slightly longer than the phonemically long vowel before a voiceless coda (LT). The small durational difference between these vowels could make the LT-SD contrast less discriminable. This is tested in the present study through an AX Same-Different discrimination experiment with 9 native speakers of English. The results of the d-prime analysis showed that the vowel duration difference in LT and SD is the least discriminable. In addition, a total of 360 monosyllabic CVC words from the CMU pronouncing dictionary were examined for the distribution of the contrasts. The CVC words were grouped into contrastive pairs/sets if they share the onset and differ in coda voicing, e.g. 2-way contrast: *leave-leaf* (but no *\*liv, \*lif*), 3-way contrast: *leap-lib-lip* (*\*leab*). Results show that the number of minimal pairs with the less discriminable LT-SD contrast is relatively smaller, compared to the number of minimal pairs with more discriminable contrasts such as LD-LT or LT-ST. The results run counter to the expectation of feature-counting models of similarity, supporting perceptual cue-based models of similarity.