

Articulatory parameters in a dispersion-focalization model of vowel systems

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Dispersion-Focalization Theory (DFT; Schwartz et al. 1997) predicts the existence of certain types of vowel systems based on their optimality in terms of overall ``dispersion'' (auditory distance between all vowel pairs) and ``focalization'' (inherent auditory salience of individual vowels). However, while these predictions match up well with attested vowel systems from the UCLA Phonological Segment Inventory Database (UPSID; Maddieson 1984, Maddieson and Precoda 1989), there are still many types of attested vowel systems that do not emerge from the DFT model (Sanders and Padgett 2008). We propose adding a third measure of optimality to the basic DFT model that corresponds to articulatory difficulty. This increases DFT's ability to predict vowel systems containing mid central vowels like schwa, which are non-optimal for auditory reasons like dispersion and focalization, but are optimal in terms of articulation. We report the results of predictions of this modified version of DFT using various settings for our proposed articulatory parameter and compare these results to attested systems in UPSID.