Naive categorization of American English vowels

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Many studies have shown evidence for the categorical perception of speech sounds (see, e.g., Liberman et al., 1957; Beddor & Strange, 1982; Lotto et al., 1998; Diehl et al., 2004). Typically, perception studies investigate the categorical boundaries between percepts with closely related acoustic structures, such as the F1 cross-over point between KIT and DRESS percepts or the VOT boundary between voiced and voiceless stop percepts. Although listener perception generally coincides with the pre-established categories of expert phoneticians, no major studies currently exist that begin without these kinds of a priori category assumptions. Without knowing the cognitive reality of these categories as nave listeners experience them, categorical perception phenomena cannot be fully interpreted.

This study works toward filling this gap in our understanding of the categorical perception of vowel sounds by presenting results based on the nave-categorization views of listeners. Instead of providing category or token labels and having listeners perform a difference-judgement task, listeners were asked to group vowel tokens into 2, 3, 4, and 5 categories as they perceived them. All listeners were previously familiar with the speaker who provided the token data. No speakers had previous experience with phonetics or the phonetic categories of vowel sounds. Results are interpreted via a correlation matrix of vowel x category groupings.

The evidence for these patterns may lend objective support to the posthoc construction of the feature [+/-peripheral] in Labov (1994) and related work or help explain the connectedness of vowels for historical work. The ways in which these nave groupings deviate from the categories of expert phoneticians can not only shed light on language change phenomena but also provide a principled benchmark from which future work on vowel perception, categorization, and change can proceed