

Small vowel inventories: the case of Kaytetye

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Abstract:

Kaytetye has been described as a language with a small set of vowels whose allophones are determined by consonantal and prosodic contexts, but there is debate over the number and identity of vowel phonemes (Koch, 1984; San, 2016; Turpin & Ross, 2012). Medial vowels in 2,210 lexical items - representing approximately 47% of the currently known Kaytetye lexicon - were read by a native female speaker and analyzed acoustically and perceptually to establish the range and identity of Kaytetye vowel realizations. Transcriptions of 11,703 medial vowel tokens by phonetically-trained auditors were compared with groupings of vowels obtained through unsupervised classification of first and second formant values using finite Gaussian mixture models. Comparisons between transcriber-perceived and machine-learned categories indicate that Kaytetye medial vowels are optimally organized into four acoustic-phonetic categories: [+front], [+back], [+low], and [-front, -back, -low]. Analysis of the contexts in which these categories occur indicates that consonantal place of articulation alone does not adequately account for their distributions. These data suggest that Kaytetye uses a 4-vowel system [i, u, e, ə]. Implications of this analysis for Kaytetye phonology are discussed, along with some considerations for the typology of small vowel systems.