Productivity in Hawaiian reduplication: allomorphy, analogy, and nearest-neighbor models

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Hawaiian reduplication adheres to three general patterns of formation (following Kennedy 2009). These include a foot suffix (*kāhana~**hana***), a foot prefix (***poha**~pohaka*), and a syllable prefix (***ma**~make*). Which of these three patterns a root takes is allomorphic, as different reduplicative patterns do not map to distinct functions. We hypothesize that the choice of reduplicative patterns in Hawaiian is at least partially analogical; roots tend to adhere to the same pattern as other, phonologically similar roots. For example, *holo* is intuitively similar to *kolo*, *nolo*, *polo*, and *ʻolo*, and is observed to reduplicate like them, as well. To formalize this idea of 'phonological similarity', we explore three nearest-neighbor models (all based on Levenshtein 1965), which we automatically evaluate over a representative corpus of Hawaiian (mined from Pukui and Elbert 1986). Our results demonstrate that analogy is indeed a strong predictor for which reduplicative pattern a root will take. This study has linguistic implications for the role of probabilistic modeling and of exemplar theory in phonology and morphology, since nearest-neighbor models represent an exemplar-based approach known as 'lazy-learning' (see e.g. Daelemans and van den Bosch 2005). Another implication of this work is that Hawaiian reduplication reveals itself to be productive, at least for computers. Students and teachers of Hawaiian might appreciate that this conclusion challenges the received view of reduplication as dead, fossilized, and unproductive.