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Patrick Shipman*, shipman@math.colostate.edu. *Continuous Natural Language Vowel Change.*

The Great English Vowel Shift of 16th–19th centuries and the current Northern Cities Vowel Shift are two examples of collective language processes characterized by regular phonetic changes, that is, gradual changes in vowel pronunciation over time. We develop a structured population approach to modeling such regular changes in the vowel systems of natural languages, taking into account learning patterns and effects such as social trends. We treat vowel pronunciation as a continuous variable in vowel space and allow for a continuous dependence of vowel pronunciation in time and age of the speaker. The theory of mixtures with continuous diversity provides a framework for the model, which extends the McKendrick–von Foerster equation to populations with age and phonetic structures. (Received September 04, 2019)