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Authors

Keogh, Aislinn

Culbertson, Jennifer

Kirby, Simon

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Communication and learning pressures result in clustered lexicons

Aislinn Keogh

University of Edinburgh, Edinburgh, United Kingdom

Jennifer Culbertson

University of Edinburgh, Edinburgh, United Kingdom

Simon Kirby

The University of Edinburgh, Edinburgh, United Kingdom

Abstract

Cross-linguistically, lexicons tend to be more phonetically clustered than required by their phonotactics; that is, words are less distinct than they could be. We use an agent-based exemplar model to investigate how this property arises over generations of language transmission under different functional pressures from learning and communication. We find that, in isolation, learnability pressures rapidly give rise to maximally clustered lexicons. When communicative pressures are also at play, clustering increases in line with a producer-side pressure to maximise similarity between words, but the rate of change is modulated by a listener-side preference for dispersion of word forms: a speaker who is trying to be understood considers what the listener is likely to understand before choosing a word to send. Overall, this work sheds light on how organisational properties of the lexicon may arise as a result of an ongoing trade-off between pressures from language learning, production and comprehension.