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Inductive Biases in the Evolution of Combinatorial Structure in Language

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Abstract

One key feature of language is duality of patterning, the ability to build utterances from individually meaningful units (morphemes), which are themselves formed by combining meaningless primitives (phonemes). Recent experimental work has demonstrated that these primitives can emerge through repeated acquisition and transmission of initially unstructured input across learners. Here we address open questions about the nature and interplay of different constraints on learning that are hypothesized to explain this phenomenon. We consider a set of experiments (Verhoef, 2012; 2016) where participants produced auditory signals using a slide whistle. Following recent advances in Bayesian program learning, our probabilistic model treats the acquisition problem as inference over the latent causes that gave rise to the whistle signals. We will describe computer simulations that explore how different learning constraints, operationalized as inductive biases in the model, give rise to structurally different 'languages' and how well different model variants account for the cited experimental data.