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Statistical learning of auditory patterns as trajectories through a perceptually defined similarity space

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Abstract: Most accounts of statistical learning (e.g., Saffran et al., 1996) assume that the learner computes cooccurrence statistics over units, such as syllables, that abstract away from the physical features of the input. This assumption need not hold when the units are underlearned, unfamiliar, or uncategorizable. We tested statistical learning with variable, unfamiliar units and show that if the featural variation is small, adults treat words differently from part-words and non-words, as if learning were occurring over abstract units. When the featural variation is large, and the categorical boundaries are unclear, participants can still learn statistical regularities defined over trajectories through this space: Words, part words and even non-words that follow trajectories consistent with the familiarization set are rated as equally familiar, whereas non-words that take trajectories opposite the familiarized direction are rated as less familiar. Conceiving of statistical learning over trajectories through perceptual space explains the results under both conditions.