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Perceptual similarity and learning from sequential statistics.

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Abstract

Most models of statistical learning do not consider the perceptual properties of the units that make up a sequence. Here, we manipulate the similarity of units in a modified version of classic statistical learning paradigm (Aslin et al., 1998). After a 3-minute familiarization stream, we asked the participants to rate their familiarity with words and part-words, with the addition of non-words (trisyllabic words without any previous exposure). We developed a simple recurrent neural network that used distributed representations for the syllables and produced similar results to the human data. We then explored how perceptual similarity impacted learning of different familiarization streams. Specifically, greater similarity relations among units were predicted to lead to poorer discrimination between words and part-words. Based on the model's results, we created a new familiarization sequence of trisyllabic words and tested for impacts on perceptual similarity on human performance.