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Visual Statistical Learning Is Facilitated in Zipfian Distributions

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Abstract

Humans can extract co-occurrence regularities from their environment, and use them for learning. This statistical learning ability (SL) has been studied extensively. However, almost all SL studies present the regularities to be learned in uniform frequency distributions (each unit appears equally often). In contrast, real-world learning environments, including the words children hear and the objects they see, are not uniform, and consequently more predictable than lab-based ones. Recent research shows that word segmentation in children and adults is facilitated after exposure to a Zipfian distribution. Here, we ask if this effect is domain-general by testing children and adults on a visual SL task. Both children and adults performed better in the Zipfian distribution compared to the uniform one, overall, and for low-frequency triplets. These results illustrate the impact of distribution predictability on learning across modality and age, and point to the possible learnability advantage of skewed distributions in the real-world.