How language shapes learning: Visual statistical learning in deaf and hearing children

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Abstract

Statistical learning (SL) is a domain-general learning mechanism necessary for multiple areas of cognitive development. The present study investigates whether children can simultaneously track temporal and spatial visual statistics and how individual differences in cognitive abilities and early language experience relate to SL. Fifty-eight hearing children aged 4–6 years (mean = 5.8) completed a novel visual SL paradigm, tracking the spatiotemporal statistics of four cartoon alien triplets. Cognitive control, receptive vocabulary, and auditory SL were also assessed to measure individual differences. Children achieved 56% accuracy on 2AFC test trials, performing above chance and demonstrating learning of complex patterns. For children under 6.5 years (n = 28), visual SL performance was positively associated with receptive vocabulary (r = 0.65) and cognitive control (r = 0.56). Future testing with deaf children in oral-speech or bilingual (ASL/English) programs will explore how language experience shapes SL capacities, offering insights into early cognitive development.

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