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The relationship between statistical learning and different facets of language ability: evidence from auditory and visual modalities

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Abstract

The relationship between language and general cognition is a key question in cognitive science. Statistical learning (SL)—the ability to extract environmental regularities without supervision—is considered a key contributor to language ability. Our study comprehensively assessed adults' language abilities (grammatical sensitivity, pragmatic comprehension, semantic prediction, violation processing), auditory and visual SL, and other cognitive functions (short-term memory, working memory, perceptual speed) to control for their effects on both language and SL. We hypothesized that auditory and visual SL would predict language abilities, with a stronger relationship for auditory SL. Surprisingly, visual SL was the best predictor of grammatical sensitivity and pragmatic comprehension, while semantic prediction and violation processing were not explained by general cognitive abilities. These results align with findings supporting a SL-language relationship and demonstrate that language is intertwined with general cognition, but also point out that facets of language ability differ in their reliance on general cognitive processes.

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