Dyslexics' usage of visual priors is impaired.

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Abstract:

Human perception benefits substantially from familiarity, via the formation of effective predictions of the environment's pattern of stimulation. Basic stimulation characteristics are automatically retrieved and integrated into our perception. A quantitatively measurable manifestation of the integration of priors is known as "contraction to the mean"; i.e., perception is biased toward the experienced mean. We previously showed that in the context of auditory discrimination, the magnitude of this bias is smaller among dyslexic individuals than among good readers matched for age and general reasoning skills. Here we examined whether a similarly reduced contraction characterizes dyslexics' behavior on serial visual tasks. Using serial spatial frequency discrimination tasks, we found that dyslexics' bias toward the experiment's mean spatial frequency was smaller than that observed for the controls. Thus, dyslexics' difficulties in automatic detection and integration of stimulus statistics are domain-general. These difficulties are likely to impede the acquisition of reading expertise.

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