Dyslexics? faster decay of implicit memory for sounds and words is manifested in their shorter neural adaptation
Abstract:

Dyslexia is a prevalent reading disability whose underlying mechanisms are still disputed. We studied the neural mechanisms underlying dyslexia using a simple frequency-discrimination task. Though participants were asked to compare the two tones in each trial, implicit memory of previous trials affected their responses. We hypothesized that implicit memory decays faster among dyslexics. We tested this by increasing the temporal intervals between consecutive trials, and by measuring the behavioral impact and ERP responses from the auditory cortex. Dyslexics showed a faster decay of implicit memory effects on both measures, with similar time constants. Finally, faster decay of implicit memory also characterized the impact of sound regularities in benefitting dyslexics' oral reading rate. Their benefit decreased faster as a function of the time interval from the previous reading of the same non-word. We propose that dyslexics' shorter neural adaptation paradoxically accounts for their longer reading times, since it reduces their temporal window of integration of past stimuli, resulting in noisier and less reliable predictions for both simple and complex stimuli. Less reliable predictions limit their acquisition of reading expertise.

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