Adults with Dyslexia Show Deficits on Spatial Frequency Doubling and Visual Attention Tasks

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ABSTRACT

We examine the visual processing of high-functioning adults with developmental dyslexia (mean Performance IQ=126.5) and current phonological problems. In comparison to an age- and IQ-matched control group, the group with dyslexia showed deficits in two tasks associated with magnocellular/dorsal pathway function. For the ‘frequency doubling’ stimulus (grating of 0.25 cpd modulated at 25Hz counterphase flicker), contrast thresholds for detection were raised in the dyslexic group. In conjunction visual search, a display time sufficient for controls to achieve ceiling accuracy at all set sizes (30 ms per item) was inadequate to allow shifts of attention around the display for the group with dyslexia. In contrast, normal performance was found on ‘popout’ visual search and on a ventral stream acuity task. Correlational analysis revealed a significant relationship between degree of deficit in conjunction search and phonological difficulty. The deficits revealed were specific to functions that rely on magnocellular input. They cannot be attributed to concentration lapses, eye movement problems or slow reaction times in the dyslexic group.