Visual processing in reading disorders and attention-deficit/hyperactivity disorder and its contribution to basic reading ability

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Whether visual processing deficits are common in reading disorders (RD), and related to reading ability in general, has been debated for decades. The type of visual processing affected also is debated, although visual discrimination and short-term memory (STM) may be more commonly related to reading ability. Reading disorders are frequently comorbid with ADHD, and children with ADHD often have subclinical reading problems. Hence, children with ADHD were used as a comparison group in this study. ADHD and RD may be dissociated in terms of visual processing. Whereas RD may be associated with deficits in visual discrimination and STM for order, ADHD is associated with deficits in visual-spatial processing. Thus, we hypothesized that children with RD would perform worse than controls and children with ADHD only on a measure of visual discrimination and a measure of visual STM that requires memory for order. We expected all groups would perform comparably on the measure of visual STM that does not require sequential processing. We found children with RD or ADHD were commensurate to controls on measures of visual discrimination and visual STM that do not require sequential processing. In contrast, both RD groups (RD, RD/ADHD) performed worse than controls on the measure of visual STM that requires memory for order, and children with comorbid RD/ADHD performed worse than those with ADHD. In addition, of the three visual measures, only sequential visual STM predicted reading ability. Hence, our findings suggest there is a deficit in visual sequential STM that is specific to RD and is related to basic reading ability. The source of this deficit is worthy of further research, but it may include both reduced memory for order and poorer verbal mediation.