Distraction by salient stimuli in adults with attention-deficit/hyperactivity disorder: Evidence for the role of task difficulty in bottom-up and top-down processing.

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Abstract

The cognitive mechanisms of increased distractibility in attention-deficit/hyperactivity disorder (ADHD) are poorly understood. The current study investigated the influence of two major modulating factors (emotional saliency, task difficulty) on behavioral and electrophysiological parameters underlying distractibility in ADHD. In addition, the attentional focus (indirect and direct processing of distractors) was examined. Thirty-six adults with ADHD and 37 healthy controls completed two experimental tasks while electroencephalography (EEG) data was collected. Task 1 assessed indirect processing of emotional or neutral distractors during a perceptual judgment task with varying task difficulty. Task 2 measured direct processing of the emotional or neutral stimuli and required participants to rate the stimuli regarding valence and arousal. Results showed that adults with ADHD exhibited generally higher behavioral distractibility than healthy controls. Furthermore, the ADHD group exhibited an enhanced bottom-up processing [increased early posterior negativity (EPN) amplitudes] of distractors in trials with high task difficulty as well as enhanced top-down processing [increased late positive potential (LPP) amplitudes] in trials with low task difficulty. However, no group differences were evident in the neural processing of emotional content or between attentional focus conditions. These findings support the notion that distractibility in ADHD results from impairments to both top-down as well as bottom-up processes and underscore the importance of task difficulty as a modulating factor.