Impaired Processing of Task-Irrelevant Salient Information in Adults With Attention-Deficit/Hyperactivity Disorder: Evidence From Event-Related Potentials.

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Abstract

The current study examined the mechanisms of attention allocation in adult ADHD to investigate the frequently reported diminished target processing in ADHD as well as the less consistently observed increased distractibility by task-irrelevant distracting stimuli. To this end, while high-density EEG was recorded, 25 adults with ADHD and 23 healthy controls completed a 4-stimulus oddball task that comprised a frequently presented standard stimulus and 3 different categories of equally infrequent stimuli: task-relevant targets, task-irrelevant nontargets, and task-irrelevant unfamiliar novels. By applying specific contrasts, this allowed us to disentangle pure effects of 3 kinds of salience, namely targetness (targets vs. nontargets), deviance (nontargets vs. standards), and novelty (novels vs. nontargets). Distinct effects of targetness, deviance and novelty across several components were found. At the behavioral level, no group differences between adults with and without ADHD were observed. Contrary to our expectations, no difference between groups was found for the P3b amplitude to targets or the novelty P3 to nontargets and novels; however, in adults with ADHD a clear P3b to novels was apparent, which was absent in controls. This latter finding indicates deficient attention allocation in adults with ADHD, more specifically increased sustained processing of task-irrelevant novel events.