Behavioral adjustment to asymmetric reward availability among children with and without ADHD: effects of past and current reinforcement contingencies

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Abstract

Altered reinforcement sensitivity is hypothesized to underlie symptoms of attention deficit hyperactivity disorder (ADHD). Here we evaluate the behavioral sensitivity of Brazilian children with and without ADHD to a change in reward availability. Forty typically developing children and 32 diagnosed with DSM-IV ADHD completed a signal-detection task in which correct discriminations between two stimuli were associated with different frequencies of reinforcement. The response alternative associated with the higher rate of reinforcement switched, without warning, after 30 rewards were delivered. The task continued until another 30 rewards were delivered. Both groups of children developed a response bias toward the initially more frequently reinforced alternative. This effect was larger in the control group. The response allocation of the two groups changed following the shift in reward availability. Over time the ADHD group developed a significant response bias toward the now more frequently reinforced alternative. In contrast, the bias of the control group stayed near zero after an initial decline following the contingency change. The overall shift in bias was similar for the two groups. The behavior of both groups of children was sensitive to the asymmetric reward distribution and to the change in reward availability. Subtle group differences in response patterns emerged, possibly reflecting differences in the time frame of reward effects and sensitivity to reward exposure.