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Acute and long-term effects of adolescent methylphenidate on decision-making and dopamine receptor mRNA expression in the orbitofrontal cortex

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Highlights:

- Adolescent methylphenidate (MPH) impaired reward size discrimination
- Delay discounting in adolescence was not affected by MPH
- In adulthood, adolescent MPH improved learning a spatial discrimination
- Expression of D3 receptor message in orbitofrontal cortex was altered by adolescent MPH

Abstract

Though commonly used as a treatment for ADHD, the psychostimulant methylphenidate (MPH) is also misused and abused in adolescence in both clinical and general populations. Although MPH acts via pathways activated by other drugs of abuse, the short- and long-term effects of MPH on reward processing in learning and decision-making are not clearly understood. We examined the effect of adolescent MPH treatment on a battery of reward-directed behaviors both in adolescence during its administration and in adulthood after its discontinuation. We further measured whether MPH had lasting effects on dopamine receptor mRNA expression in