Assessing Impulsivity in Prepubertal Male Rats: A Novel Device and Method to Assess Motor and Cognitive Impulsivity.

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Exp Clin Psychopharmacol. 2013 Jul 15. [Epub ahead of print]

The use of animal models in studies of impulsivity has made valuable contributions to our understanding of this behavioral trait as it relates to disorders such as attention deficit hyperactivity disorder. The objective of this work was to develop a paradigm that would make it possible to evaluate both motor and cognitive impulsivity using the same device after a short training period. The operant behavior demanded in this device consists in having rats cross a bridge after receiving a signal to obtain a reward that is available on a goal platform in a Wait-to-Go-signal task, or in crossing a bridge after the animals make a choice between two alternatives in a Delay-discounting task. To test this device and method, a study was conducted using an animal model of dopaminergic dysfunction produced by prenatal alcohol treatment (which has been shown to cause attention deficits and alterations of impulsivity in adult rats). Compared with controls, prepubertal male rats treated prenatally with alcohol showed both higher cognitive and higher motor impulsivity as assessed by the parameters used. Although attention changes proved not to be dependent on prenatal treatment, they were sensitive to the task performed. The device and methods introduced herein thus constitute useful instruments for evaluating impulsivity. Their significant advantages include a short investment in training time, and the ability to assess different types of impulsivity from the vantage point of distinct theoretical perspectives.