

Adolescent Rats Develop Habitual Responding More Slowly Than Do Adults

Occurring with the onset of puberty and ending with adulthood, adolescence is a critical time of development. Along with adolescent-typical increases in risk-taking/novelty-seeking and elevated social activity, drug and alcohol use also often begin in adolescence, with rates of alcohol dependence reaching their highest levels during late adolescence/emerging adulthood. The excessive alcohol use associated with dependence has sometimes been associated with the emergence of strong habitual behavior toward the drug that overrides more cognitively based, goal-directed responding. The emergence of habitual behavior has been studied extensively in adults, but less so in adolescents. Consequently, the current study's primary focus was to examine age-related differences in the expression of goal-directed vs. habitual behavior in adolescent and adult Sprague-Dawley rats using operant conditioning. Each animal was trained to lever press to receive banana-flavored pellets on either a random interval (RI) or random ratio (RR) schedule that has been shown to promote habitual and goal-directed behaviors, respectively. Habit formation was indexed by continued operant responding following reward devaluation induced by sensory-specific satiety, whereas devaluation-precipitated response suppression reflected goal-directed behavior. Surprisingly, the results indicated that adolescent rats maintain goal-directed responding under the same circumstances where habitual behavior is observed in adult rats with the same amount of training.

Key Words: Alcohol, Adolescent, Habit, Goal-directed, Sensory-specific satiety