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Adolescent Motivation and Cognitive Control

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Toward a Better Understanding of...

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Research suggests that rewards impact motivated behavior differently in adolescents than in adults. This has real-world consequences, as teenagers may have increased susceptibility to engage in risky decision-making, especially in high-reward situations or emotionally salient contexts. Adolescence is a unique period in human development, marked by new responsibilities such as learning to drive or making consequential decisions about the future. In addition to behavioral evidence, cognitive neuroscience research has revealed differential engagement of reward-processing systems in the adolescent vs. adult brain, coupled with an underdeveloped prefrontal cortex, which governs cognitive control. Cognitive control is the ability to flexibly maintain and rapidly update task representations, allowing an individual to ignore irrelevant stimuli and switch goals when necessary. Previous studies have examined the behavioral aspects of adolescent motivation and decision-making, but none have sought to investigate whether and how adolescents integrate different types of incentives. The following study incorporates both primary and secondary incentives—liquid feedback and monetary rewards, respectively—with a cognitive control task, to test whether adolescent performance is differentially modulated (relative to young adults) by these varying incentive conditions. Three liquids were examined that differ in affective valence, with apple juice as appetitive feedback (positive valence), an isotonic tasteless solution (neutral valence), and saltwater as aversive feedback (negative valence). Adolescents (ages 13-18) performed a novel computerized letter-digit task-switching paradigm, developed by Yee et al. in the Cognitive Control and Psychopathy (CCP) Lab at Washington University in St. Louis, requiring subjects to recruit cognitive control to appropriately update the relevant task goal for each trial. Results will be discussed in relationship to similar studies conducted in the CCP lab investigating a young adult demographic (ages 18-40). More specifically, we will report the effects of primary and secondary incentives and how they influence motivation in combination as well as individually.