



Science Update

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Adolescent Brains Show Lower Activity In Areas That Control Risky Choices

A new NIMH study could help explain why adolescents are so prone to make risky choices. When contemplating risky decisions, they show less activity in regions of the brain that regulate processes involved in decision-making, compared with adults. The areas are among the last to develop and are involved in control of “thinking” functions, including decision-making, and in processing reward-related input and behavior (the orbitofrontal/ventrolateral prefrontal cortex and dorsal anterior cingulate cortex).

Results of the study were reported in the March 9 issue of *Neuropsychologia* by Monique Ernst, MD, Ph.D., and colleagues from the NIMH Emotional Development and Affective Neuroscience Branch.

The study, which included data on 16 adolescents and 14 adults, involved a game of chance. At each turn, they could choose a high-risk or low-risk option to try to win. The high-risk option offered greater reward than the low-risk option, but the chance of winning was much lower. Scientists measured brain activity while the participants made their choices, using technology called functional magnetic resonance imaging.

The results suggest that when it comes to making choices involving risk, adolescents do not engage the higher-thinking, decision-and-reward areas of the brain as much as adults do.

Brain development continues throughout adolescence, and the reduced activity seen in specific areas in the healthy adolescents in this study appears to be normal. Studies like this one are helping researchers map normal maturation in the brain, data that can then be used for comparison in studies of mental illnesses — some of which begin during adolescence, including depression and anxiety disorders.

Eshel N, Nelson EE, Blair J, Pine DS, Ernst M. Neural substrates of choice selection in adults and adolescents: development of the ventrolateral prefrontal and anterior cingulate cortices. Neuropsychologia, online Jan. 23, 2007; in print March 9, 2007.

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