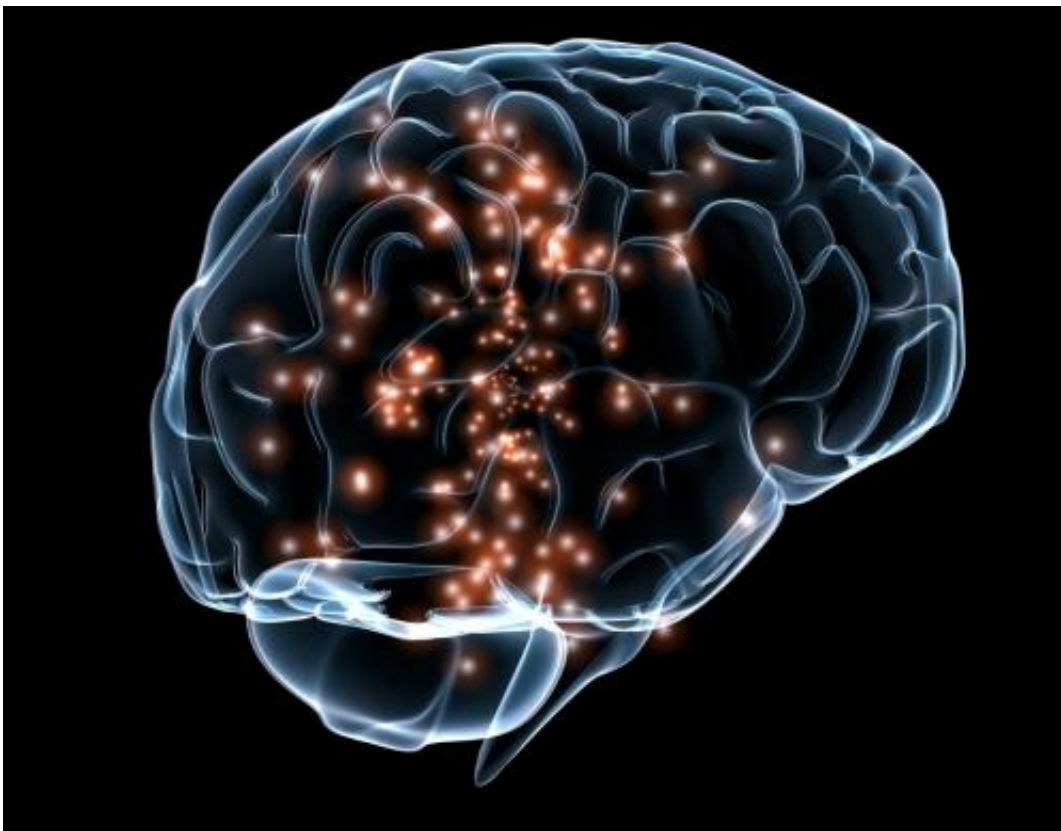


Early life stress and adolescent depression linked to impaired development of reward circuits

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Early life stress is a major risk factor for later episodes of depression. In fact, adults who are abused or neglected as children are almost twice as likely to experience depression.

Scientific research into this link has revealed that the increased risk following such [childhood adversity](#) is associated with sensitization of the brain circuits involved with processing threat and driving the stress response. More recently, research has begun to demonstrate that in parallel to this stress sensitization, there may also be diminished processing of reward in the brain and associated reductions in a person's ability to experience [positive emotions](#).

Researchers at Duke University and the University of Texas Health Sciences Center at San Antonio looked specifically at this second phenomenon in a longitudinal neuroimaging study of adolescents, in order to better understand how early [life stress](#) contributes to depression.

They recruited 106 adolescents, between the ages of 11-15, who underwent an initial magnetic resonance imaging scan, along with measurements of mood and neglect. The study participants then had a second brain scan two years later.

The researchers focused on the [ventral striatum](#), a deep brain region that is important for processing rewarding experiences as well as generating positive emotions, both of which are deficient in depression.

"Our analyses revealed that over a two-year window during early to mid-adolescence, there was an abnormal decrease in the response of the ventral striatum to reward only in adolescents who had been exposed to emotional neglect, a relatively common form of childhood adversity where parents are persistently emotionally unresponsive and unavailable to their children," explained first author Dr. Jamie Hanson.

"Importantly, we further showed that this decrease in ventral striatum activity predicted the emergence of depressive symptoms during this key developmental period," he added. "Our work is consistent with other recent studies finding deficient reward processing in depression, and

further underscores the importance of considering such developmental pathways in efforts to protect individuals exposed to childhood adversity from later depression."

This study suggests that, in some people, early life stress compromises the capacity to experience enthusiasm or pleasure. In addition, the effect of early life stress may grow over time so that people who initially appear resilient may develop problems later in life.

"This insight is important because it suggests a neural pathway through which early life stress may contribute to depression," said Dr. John Krystal, Editor of *Biological Psychiatry*. "This pathway might be targeted by neural stimulation treatments. Further, it suggests that survivors of [early life](#) trauma and their families may benefit from learning about the possibility of consequences that might appear later in life. This preparation could help lead to early intervention."

More information: Jamie L. Hanson et al. Blunted Ventral Striatum Development in Adolescence Reflects Emotional Neglect and Predicts Depressive Symptoms, *Biological Psychiatry* (2015). [DOI: 10.1016/j.biopsych.2015.05.010](#)

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