

# Brain function impacts how experiences contribute to depression

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A study in adolescent girls reports that recent life events impact depressive symptoms differently, depending on how the brain responds to winning and losing. A strong brain response to winning boosted the beneficial impact of positive experiences on symptoms, whereas a strong response to losing enhanced the detrimental impact of negative experiences on symptoms.

The findings were published in *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*.

"This finding helps refine our understanding of how two types of known risk factors for depression, [life events](#) exposure and neural response to wins and losses, might interact to influence depression," said first author Katherine Luking, Ph.D., of Stony Brook University, New York. The link between [brain response](#), impact of daily experiences, and depressive symptoms in the study indicates that brain function determines how life experiences contribute to risk for and protection against depressive symptoms.

Exposure to negative life events in particular has been strongly linked to increased risk for depression. "This study is novel in that we go beyond [negative events](#) to investigate the unique effects of both positive and negative life events on depressive symptoms during a vulnerable time in development, early adolescence," said Dr. Luking.

Adolescent girls, eight to 14 years old, performed a task in which they could win or lose money. Girls with a stronger brain response to winning showed a relationship between positive life events dependent on their behavior—such as making a new friend—and reduced depressive symptoms. According to Dr. Luking, this means that "girls whose brains are more responsive to winning are better able to reap the benefits of the positive experiences that they create in their own lives."

The study also found that girls with a strong response to losses showed a relationship between negative life events independent of their behavior—such as experiencing a natural disaster—and increased [depressive symptoms](#). This means that "girls whose brains are more responsive to losing are more vulnerable to the effects of negative events, particularly those beyond their control," said Dr. Luking.

"These results provide a window into how mechanisms in the brain might be targeted to modify the effects of positive and [negative experiences](#) on the moods of girls during a critical developmental period in their lives," said Cameron Carter, MD, Editor of *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*. The findings suggest that treatments designed to increase responses to winning or decrease responses to losing could help strengthen the effect of positive experiences or reduce the harmful effect of negative experiences. Modifying the effects of these experiences could help protect against or reduce the risk for depression.

**More information:** Katherine R. Luking et al. Ventral Striatal Function Interacts with Positive and Negative Life Events to Predict Concurrent Youth Depressive Symptoms, *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* (2018). [DOI: 10.1016/j.bpsc.2018.07.007](#)

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