

# Personality and mood affect brain response to personal choice

November 20 2018

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Personality traits and mental health affect how people value personal control in decision making, according to a new study in *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*. Our brain's reward and motivation systems show higher activity when we feel personal control in a situation and when we receive rewards that we've earned,

rather than been given—but this activity was dampened in people with passive personalities or with symptoms of depression. The connections between personality, choice, and depression may help guide researchers to understand how to protect healthy people from developing the illness.

"This study, which used computational models of [reward](#) behaviors and functional MRI, represents an advance in our understanding of how rewards shape choices in the brains of healthy individuals," said Cameron Carter, MD, Editor of *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*.

In the study, the researchers used an MRI scanner to measure the brain activity of 122 healthy participants while the participants played a computer game to earn rewards. "We were interested to see how people value rewarding outcomes based on their own personally-driven decisions, versus those that are decided for them by the computer," said first-author Liana Romaniuk, Ph.D., University of Edinburgh.

"We found that an area that is important for motivation and learning by trial-and-error—the ventral striatum—was especially active when people were told they were going to get to make a decision," said Dr. Romaniuk.

Although all of the participants in the study were considered healthy, the researchers looked for relationships between the [brain activity](#) and symptoms of depression. Activation in the [ventral striatum](#) was reduced in people with some symptoms of depression, which may help explain why people with depression lose their motivation.

"Since these brain networks were differentially active in the presence of subclinical depressive symptoms, it suggests a future role for functional brain imaging in understanding individual differences in mental wellness and in informing early intervention and prevention of mood disorders,"

said Dr. Carter.

The findings also provide clues as to how personality might make a person susceptible to depression. "People who were more self-motivated had stronger responses to personally-earned rewards in a region of cortex called the insula, whereas more passive people showed the opposite," said Dr. Romaniuk, adding that "The insula is important because we know its function is altered in people with depression."

**More information:** Liana Romaniuk et al. The Neurobiology of Personal Control During Reward Learning and Its Relationship to Mood, *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* (2018). DOI: [10.1016/j.bpsc.2018.09.015](https://doi.org/10.1016/j.bpsc.2018.09.015)

Provided by Elsevier

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