

Brain activation provides individual-level prediction of bipolar disorder risk

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Patterns of brain activation during reward anticipation may help identify people most at risk for developing bipolar spectrum disorders (BPSD), according to a study in *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*. Mania in people with BPSD is often accompanied by impulsivity, including impulsive responses to potential rewards. In the study, patterns of neural activation during a reward task predicted the severity of the mania symptom in young adults who have not yet developed the disorder.

"Given that emerging manic symptoms predispose to bipolar disorders, these findings can provide neural biomarkers to aid early identification of bipolar disorder risk in [young adults](#)," said first author Leticia de Oliveira, Ph.D., Federal Fluminense University, Brazil.

Having a family member with BPSD puts a person at risk for the disorder, but the relationship doesn't provide enough information to make decisions about potential interventions to help delay or prevent the disorder. The new study shows for the first time that [brain activation patterns](#) could be used to predict BPSD risk on an individual level. "These findings could be potentially used to guide the development and choice of early therapeutic interventions, reducing the significant social costs and deleterious outcomes associated with the disorder in these vulnerable individuals," said Dr. Oliveira.

To be sure that the approach would apply to anyone at risk, Dr. Oliveira and colleagues performed the brain imaging in a transdiagnostic group of young adults—the participants had a variety of psychiatric complications, but none had yet developed BPSD.

Of the whole brain, activation in a brain region used during decision making in reward contexts, called the [ventrolateral prefrontal cortex](#) (vlPFC), contributed the most to the prediction of symptom

severity. This suggests that vlPFC activity in particular may be useful to predict severity of mania symptoms associated with BPSD risk in young adults.

"This study shows how the powerful combination of computational image analysis tools and functionally targeted task fMRI (in this case reward processing) can provide insights into the neural systems underlying symptoms that may indicate liability to mania, in a young, non-bipolar transdiagnostic group of psychiatric patients," said Cameron Carter, MD, Editor of *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*.

The researchers replicated the results and the role of the vlPFC in a second independent sample of young adults in the same study, further confirming the potential utility of neural activation in this [brain](#) region as a biomarker for BPSD risk.

More information: Leticia de Oliveira et al, Predicting Bipolar Disorder Risk Factors in Distressed Young Adults From Patterns of Brain Activation to Reward: A Machine Learning Approach, *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* (2019). DOI: [10.1016/j.bpsc.2019.04.005](https://doi.org/10.1016/j.bpsc.2019.04.005)

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