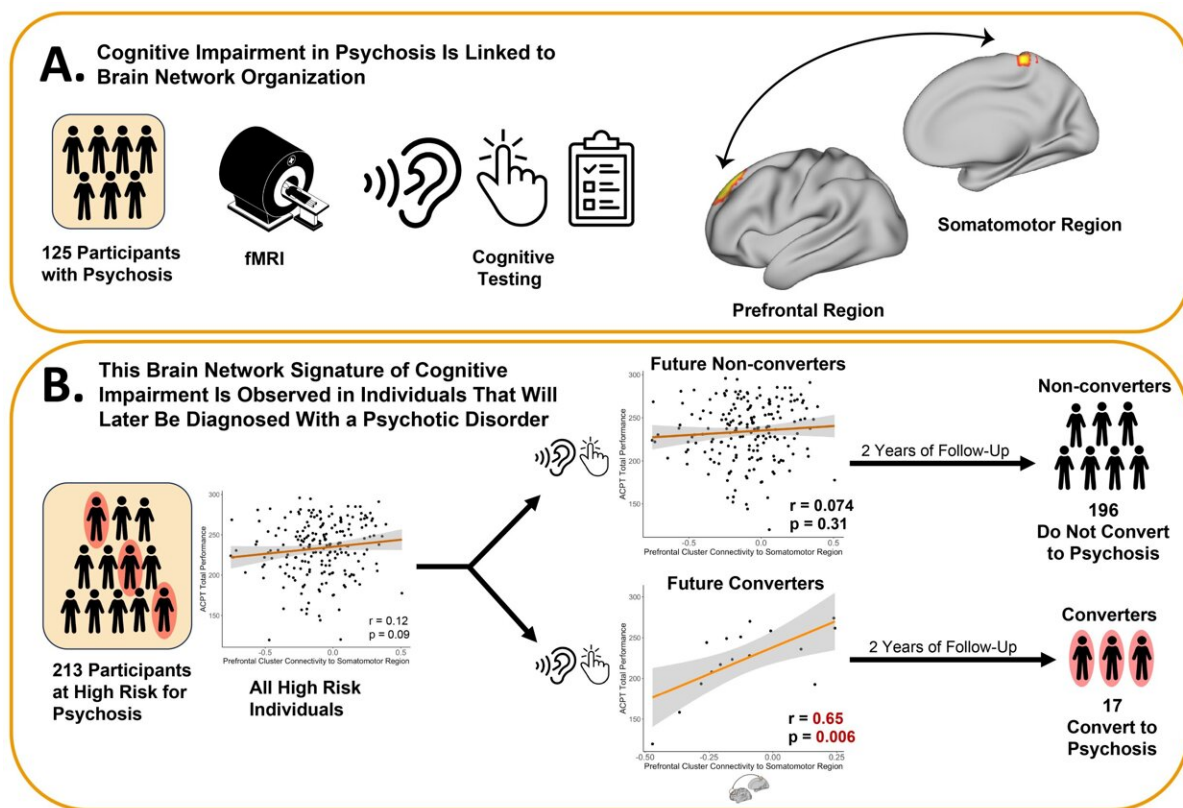


Study shows promise for early detection and intervention in psychotic disorders such as schizophrenia

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A groundbreaking study in *Biological Psychiatry* uncovers a relationship between cognition and brain networks prior to a psychotic break in individuals at risk for psychotic disorders. A. By using fMRI data and specialized cognitive testing designed for individuals diagnosed with psychotic disorders, researchers observed that cognitive impairment was linked to brain network organization. B. Further analysis of data from individuals considered at-risk for psychotic

disorders, but who had not yet had their first psychotic episode, uncovered that this same brain network-cognition relationship was observed prior to their diagnosis with a psychotic disorder. Credit: Biological Psychiatry

According to new research, cognitive impairments in psychotic disorders, such as schizophrenia and bipolar disorder, are linked to brain network organization. This link between cognition and brain networks is present in individuals considered at-risk for psychotic disorders even prior to their first psychotic break. The study, [published](#) in *Biological Psychiatry*, suggests an opportunity for early diagnosis and intervention for these treatment-resistant symptoms.

Lead author Heather Burrell Ward, MD, Department of Psychiatry and Behavioral Sciences, Vanderbilt University Medical Center, explains, "Cognitive impairment is highly prevalent in schizophrenia and other [psychotic disorders](#). There are currently no medications to treat cognitive impairment, resulting in significant disability.

"This impairment is frequently present by the time an individual has their first psychotic break, making early detection and intervention critical. Our current study is part of our work to understand and treat the medication-resistant symptoms of psychotic disorders."

Several cognitive domains found to be reliably impaired in psychotic disorders have received intensive study, such as overall cognitive ability. To measure cognitive impairment in psychosis, most studies have utilized cognitive tasks originally designed and validated in control populations.

However, these studies do not address the question of whether cognitive constructs map onto quantifiable brain substrates. The current research

used a cutting-edge MRI analysis approach and a cognitive test designed for people with psychosis to analyze data collected by two consortia of researchers: the Human Connectome Project for Early Psychosis (HCP-EP) and the North American Prodrome Longitudinal Study (NAPLS).

Co-senior author Roscoe O. Brady, Jr., MD, Ph.D., Harvard Medical School; Department of Psychiatry, Beth Israel Deaconess Medical Center, and McLean Hospital and Harvard Medical School, notes, "We observed that in individuals with psychotic disorders, cognitive impairment is linked to brain network organization. We then attempted something that has not been previously demonstrated: We asked if we can observe this same brain signature of [cognitive impairment](#) in individuals prior to their psychotic break.

"We analyzed data from individuals considered at-risk for psychotic disorders, but who had not yet had their first psychotic episode. We identified this same brain network-cognition relationship only in individuals who would eventually develop psychosis in the future."

Commenting on the implications of the study, John Krystal, MD, Editor of *Biological Psychiatry*, says, "Researchers of this novel study used the combination of a data-driven connectome-wide multivariate pattern analysis and a disease-informed cognitive assessment to identify a novel and reproducible relationship between brain connectivity and cognitive performance in psychotic disorders, offering important insights for the early detection and intervention of psychotic disorders."

Co-senior author Kathryn E. Lewandowski, Ph.D., McLean Hospital and Harvard Medical School, concludes, "There is an ongoing international effort to identify biomarkers and targets for intervention in individuals at-risk for psychotic disorders through the Accelerating Medicines Partnership Schizophrenia (AMP SCZ). Our discovery of a link between cognition and [brain networks](#), observed even prior to the first psychotic

break, suggests an opportunity for [early diagnosis](#) and intervention, such as via noninvasive neuromodulation."

More information: Heather Burrell Ward et al, Robust Brain Correlates of Cognitive Performance in Psychosis and its Prodrome, *Biological Psychiatry* (2024). [DOI: 10.1016/j.biopsych.2024.07.012](https://doi.org/10.1016/j.biopsych.2024.07.012)

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