



# Science shows very different psychiatric disorders might have the same cause

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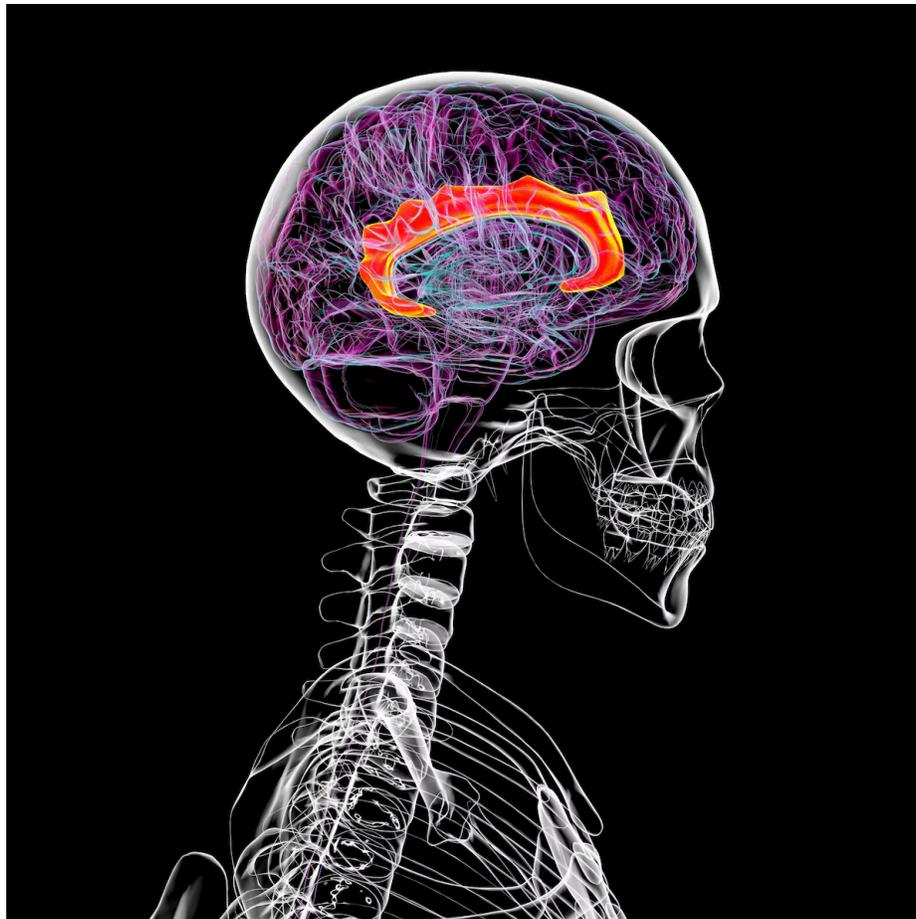
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A 3D illustration of the human brain highlighting the cingulate gyrus, which is essential for emotion processing, decision-making and cognitive control. (Kateryna Kon/Science Source)



By [Mark Johnson](#)

A sweeping new study of psychiatric and genetic records has the potential to change treatment for millions of psychiatric patients, finding that many conditions involve similar genes and may not need to be treated as distinct illnesses.

In essence, the study suggests that bolstering the traditional emphasis on patient behavior with a deeper understanding of the biology of mental illness could lead to better treatment.

Published in *Nature*, the [paper](#) addresses the boundaries psychiatry uses to separate similar conditions like bipolar disorder and schizophrenia. The research also suggests that linking genes to the brain processes they influence will provide psychiatrists with greater insight into their patients, and guide researchers toward new therapies.

The findings could also spare patients the burden of carrying multiple different diagnoses that require an assortment of different pills.

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Half of all people will experience a psychiatric disorder in their lifetime, according to a 2010 study in the journal *Psychiatry*. More than half of all psychiatric patients will be diagnosed with a second or third disorder, and about 15 percent will be diagnosed with at least four disorders, according to a [2018 study](#) in the *American Journal of Psychiatry*.

“If you are someone who’s being told that you have four separate things, that can lead to a lot of pessimism about how this therapeutic process is going to go,” said Andrew Grotzinger, one of the authors of the new study and an assistant professor of psychology and neuroscience at University of Colorado Boulder.

“The kind of medical metaphor I’d offer is that if you went to the doctor with a runny nose, cough and sore throat and you got diagnosed with runny nose disorder, cough disorder and sore throat disorder, and prescribed three separate pills, we would consider that sort of a medical misstep.”

To produce the Nature study, a large international team of researchers spent five years analyzing records from more than 1 million people diagnosed with one of 14 psychiatric disorders, and 5 million people with no such diagnosis.

The scientists found that genetic similarities among the 14 disorders suggest that they fall into five essential categories: substance use disorders; internalizing conditions such as depression, anxiety and post-traumatic stress disorder; neurodevelopmental conditions such as autism and attention-deficit/hyperactivity disorder; compulsive conditions such as anorexia nervosa, Tourette's syndrome and obsessive-compulsive disorder; and a fifth group that includes bipolar disorder and schizophrenia. The study found that bipolar disorder and schizophrenia share about 70 percent of the same genetic drivers.

“If you look at what the genes are telling us, it suggests that these different categories are more fundamentally related at the biological level than we had thought,” said Jordan Smoller, an author of the paper and director of Mass General Brigham's Center for Precision Psychiatry in Boston. The similarities help explain why some antidepressants seem to work, not only for depression, but also for anxiety and post-traumatic stress disorder.

While genes contribute to our risk for psychiatric disorders, they interact with other factors including upbringing, life events and stress.

Researchers found that the 14 psychiatric disorders they examined were linked by 238 unique genetic variants, sequences in our genetic code that differ from the most common form. Many of the variants likely regulate specific brain functions. Bipolar disorder and schizophrenia, for example, both involve higher-than-normal activity of genes that influence excitatory neurons, which are heavily involved in transmitting signals between other neurons.

The scientific team also identified a so-called hot spot on Chromosome 11, a cluster of genes that is involved in raising the genetic risk for eight of the disorders. Chromosome 11 is known for having a concentration of medically important

genes involved in psychiatric conditions such as depression and autism, as well as various cancers and blood disorders.

One such gene is the primary target of antipsychotic drugs, DRD2, which regulates dopamine, a key chemical messenger in the brain that affects motivation, reward, mood, attention and cognition.

Authors of the Nature paper acknowledged that their study was limited by the fact that the preponderance of genetic data now comes from people of European ancestry. Scientists are now trying to broaden the diversity of the populations included in genetic datasets.

Experts in neurology and psychiatry differed in their assessment of the Nature study, offering a possible preview of debates that may take place as the American Psychiatric Association prepares the sixth edition of the Diagnostic Statistical Manual of Mental Disorders, the comprehensive handbook used by clinicians, researchers and insurance companies.

“What’s so wonderful about this paper – and one of the reasons I ain’t retired yet – is that I strongly believe that psychiatry will change more in the next 10 years than it has in the last century. And it’s work like this that gives me hope that my opinion is right,” said Scott Aaronson, chief science officer for Sheppard Pratt’s Institute for Advanced Diagnostics and Therapeutics in Baltimore.

Aaronson said diagnosing patients based not on biology, but on how they appear and act in a psychiatrist’s office, can be misleading.

He recalled identical twins, one of whom he treated, the other he only met. “One was diagnosed with schizophrenia, the other twin was diagnosed with bipolar disorder,” Aaronson said. “And it was really because, even though they had the exact same genetics, one had a presentation that was largely a psychotic disorder and one had a presentation that was largely a mood disorder.”

The difference between the two is that mood disorders are characterized by extreme emotional states, while psychotic

disorders involve a break from reality.

Ken Duckworth, the chief medical officer at the National Alliance on Mental Illness, said that until now, “the genetics revolution has not yielded much in the field,” of psychiatry. “Cancer is way ahead of us, and that’s because we still have difficulty understanding the underlying biological roots,” of mental illness.

But at this point, Duckworth said, “there’s no practical application” to the findings in the Nature study. “A man in Des Moines, Iowa, who’s trying to figure out what’s going on with him will not be able to get,” the same kind of genetic assessment use by the researchers who wrote the Nature paper, “to help inform his treatment.”

Ramiro Salas, a senior research scientist at the Menninger Clinic in Houston, called the paper “a beautiful step in the right direction that adds data to use in the future, when we redefine psychiatry using biology.”

Salas, who is also an associate professor in Baylor College of Medicine’s Department of Psychiatry Research called the size of the study “amazing,” but cautioned that “in one sense, what we are going toward and what we want is personalized psychiatry,” and the new study “goes in the exact opposite direction. I don’t think all depression patients are the same in terms of their biology.” He said that’s why, “anti-depressants tend to work on one-third of the patients. And not all patients who benefit from one anti-depressant would benefit from any other.”

Conor Liston, a psychiatrist at New York Presbyterian and Weill Cornell Medicine, said it may be a while before genetic information leads to shifts in the Diagnostic Statistical Manual of Mental Disorders, often referred to as the DSM.

“The committee that decides what goes into the DSM doesn’t make change willy-nilly, and that’s probably a good thing,” Liston said. “But I do think a time is coming, whether it is in DSM6 or DSM7, or some other time down the road when genetics will part of what we’re considering

in psychiatry when we're making diagnoses. Perhaps not just genetics. Perhaps other biological measures too.”

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By [Mark Johnson](#)

Mark Johnson joined The Washington Post in July 2022 after 22 years at The Milwaukee Journal Sentinel, where he covered health and science. He wrote about the first person to survive rabies without vaccine, and reported on the first use of full gene sequencing to diagnose and treat a new disease. [X@majohnso](#)

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