

Recognizing the uniqueness of individuals with schizophrenia

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Functional magnetic resonance imaging (fMRI) and other brain imaging technologies allow for the study of differences in brain activity in people diagnosed with schizophrenia. The image shows two levels of the brain, with areas that were more active in healthy controls than in schizophrenia patients shown in orange, during an fMRI study of working memory. Credit: Kim J, Matthews NL, Park S./PLoS One.

Schizophrenia is an extremely variable psychiatric disorder that is diagnosed based on the presence of specific symptoms. Thomas Wolfers and André Marquand of Radboud university medical center investigated how much the brains of individual patients diagnosed with schizophrenia

differ from the 'average' patient. For this purpose, they compared brain scans of 250 healthy individuals with those of 218 individuals with schizophrenia. Those with schizophrenia—as a group—differed from the healthy individuals in frontal brain regions, the cerebellum, and the temporal cortex.

However, the [differences](#) between individuals were so great that it is virtually meaningless to speak of 'the average patient.' Only a few identical differences in the brain occurred in more than two percent of [patients](#). The largest number of differences were only observed on an individual level. According to Marquand: "The brains of individuals with [schizophrenia](#) differ so much from the average that the average has little to say about what might be occurring in the brain of an individual."

The study shows that almost all individuals with schizophrenia have their own biological profile. This highlights the problems with the current method of diagnosing psychiatric disorders on the basis of symptoms. According to Marquand: "We can see substantial variation in the brains of different [individuals](#) with schizophrenia, but despite this variation, all these people get the same diagnosis. As a result, we think that it is difficult to get a better understanding of the biology underlying schizophrenia simply by studying the average patient. We need to identify the brain 'fingerprint' of the disorder for each individual patient. In the future, this might be able to help psychiatrists to identify the best treatment for each individual."

The researchers want to create a fingerprint for each individual [brain](#), documenting the differences in relation to the group average. This should lead to a more complete picture of each individual patient. Wolfers: "In practice, psychiatrists and psychologists know very well that each patient is an individual, with their own story, history, and biology. Nevertheless, we use diagnostic models that largely ignore these differences. Together with our colleagues in Europe, we raise awareness

of this issue by developing methods that make it possible to consider the individual as a whole. We look at both the symptoms and the biology. It is still a long way to go before this research will yield visible practical results, but in the long term, we hope it will lead to better diagnoses and individualized therapies for patients."

The study is reported in *JAMA Psychiatry*.

More information: *JAMA Psychiatry* (2018). [DOI: 10.1001/jamapsychiatry.2018.2467](https://doi.org/10.1001/jamapsychiatry.2018.2467)

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