

Why people with schizophrenia may have trouble reading social cues

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Understanding the actions of other people can be difficult for those with schizophrenia. Vanderbilt University researchers have discovered that impairments in a brain area involved in perception of social stimuli may be partly responsible for this difficulty.

"Misunderstanding [social situations](#) and interactions are core deficits in schizophrenia," said Sohee Park, Gertrude Conaway Professor of Psychology and one of the co-authors on this study. "Our findings may help explain the origins of some of the [delusions](#) involving perception and thoughts experienced by those with schizophrenia."

In findings published in the journal [PLoS ONE](#), the researchers found that a particular brain area, the posterior superior temporal sulcus or STS, appears to be implicated in this deficit.

"Using brain imaging together with perceptual testing, we found that a brain area in a [neural network](#) involved in perception of social stimuli responds abnormally in individuals with schizophrenia," said Randolph Blake, Centennial Professor of Psychology and co-author. "This brain area fails to distinguish genuine biological motion from highly distorted versions of that motion."

The study's lead author, Jejoong Kim, completed the experiments as part of his dissertation under the supervision of Park and Blake in Vanderbilt's Department of Psychology. Kim is now conducting research in the Department of Brain and Cognitive Sciences at Seoul National

University in Korea, where Blake is currently a visiting professor.

"We have found... that people with schizophrenia tend to 'see' living things in randomness and this subjective experience is correlated with an increased activity in the (posterior) STS," the authors wrote. "In the case of biological motion perception, these self-generated, false impressions of meaning can have negative social consequences, in that schizophrenia patients may misconstrue the actions or intentions of other people."

In their experiments, the researchers compared the performance of people with schizophrenia to that of healthy controls on two visual tasks. One task involved deciding whether or not an animated series of lights depicted the movements of an actor's body. The second task entailed judging subtle differences in the actions as depicted by two animations viewed side by side. On both tasks, people with schizophrenia performed less well than the healthy controls.

Next, the researchers measured brain activity using functional magnetic resonance imaging (fMRI) while the subjects—healthy controls and schizophrenia patients—performed a version of the side-by-side task. Once again, the individuals with schizophrenia performed worse on the task. The researchers were then able to correlate those performance deficits with the brain activity in each person.

The fMRI results showed strong activation of the posterior portion of the STS in the healthy controls when they were shown biological motion. In the individuals with schizophrenia, STS activity remained relatively constant and high regardless of what was presented to them.

Analysis of the brain activity of the schizophrenia patients also showed high STS activity on trials where they reported seeing biological motion, regardless of whether the stimulus itself was biological or not.

For reasons yet to be discovered, area STS in [schizophrenia](#) patients fails to differentiate normal human activity from non-human motion, leading Kim and colleagues to surmise that this abnormal [brain](#) activation contributes to the patients' difficulties reading social cues portrayed by the actions of others.

Provided by Vanderbilt University

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