

Key brain 'networks' may differ in autism, study suggests

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Neural systems tied to gauging social cues appear 'over-connected' in children with the disorder.

(HealthDay)—Differences in brain connectivity may help explain the social impairments common in those who have autism spectrum disorders, new research suggests.

The small study compared the brains of 25 teens with an autism spectrum disorder to those of 25 typically developing teens, all aged 11 to 18. The researchers found key differences between the two groups in brain "networks" that help people to figure out what others are thinking, and to understand others' actions and emotions.

"It is generally agreed that the way the networks are organized is not typical [in those with autism]," explained study lead researcher Inna

Fishman, assistant research professor of psychology at San Diego State University.

The prevailing idea until now, she said, has been that these neurological networks are under-connected in people with autism. However, "we found they were over-connected—they talk to each other way more than expected at that age."

The study is published in the April 16 online edition of *JAMA Psychiatry*.

According to recent statistics issued by the U.S. Centers for Disease Control and Prevention, about one in 68 children in the United States has been identified with an autism spectrum disorder. Boys are about five times more likely to be affected than are girls.

Fishman said the approach her team took in the study is a relatively new one.

"In the last seven to 10 years, people began to understand that we shouldn't be searching for answers in any individual brain area, but looking at the brain as a collection of networks," she said.

In the study, Fishman's team used functional MRI scans to look at the connectivity in two [brain networks](#), both involved in social processing. One is the "mentalizing" system, also known as the theory of mind. It helps a person infer what others are thinking, their beliefs and intentions. The other is the "mirror neuron" system, which helps people understand the meaning and actions of another by replicating them.

People with autism show differences in this connectivity compared to typically developing people, and it predominately manifests as over-activity, Fishman's team noted. The researchers also found that the

greater the differences in neural connectivity, the more severe the child's social skill problems.

Although the study could not prove cause and effect, these findings suggest that differences in this neurological "cross talk" might be linked with social impairments, Fishman said.

The research was supported by the U.S. National Institutes of Health and the Autism Science Foundation.

One expert who reviewed the study said the findings were preliminary but intriguing.

"There have been an enormous number of studies that have found differences [in brains of children with autism]," said Dr. Andrew Adesman, chief of developmental and behavioral pediatrics at the Cohen Children's Medical Center of New York in New Hyde Park, N.Y.

"The differences haven't always been consistent. We still don't yet understand what causes autism, nor do we have a great handle on how the brain of those with autism differs," he explained.

"What they found was that this excess connectivity is more common in those with more severe symptoms," Adesman said. However, "they are not sure if this is a chicken or egg [finding]."

The researchers agree, noting that they can't establish cause and effect. In essence, it's possible that the abnormal social development of children with an autism spectrum disorder may lead to the connectivity differences, they said, not the other way around.

Fishman said her team is planning further study, however. She said that if the findings are replicated, there might be a way to tweak the neural

networks to bring them closer to that of children without an autism spectrum disorder.

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