

Brain study suggests way to measure, treat autism

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Researchers have pinpointed subtle deficits in the brains of people with autism spectrum disorder (ASD) that they say could aid more precise diagnoses and perhaps improve treatment of ASD. The researchers discovered characteristic patterns of brain activity in people with ASD that reflect an inability to perceive themselves as social creatures.

P. Read Montague and colleagues published their findings in the February 7, 2008, issue of the journal *Neuron*, published by Cell Press.

Their experiments involved asking groups of high-functioning people with ASD and normal people to play a “social trust” game as their brains were scanned using functional magnetic resonance imaging. In this widely used imaging technique, harmless magnetic fields and radio waves are used to map brain flow in brain regions, which reflects brain activity.

In the game, an “investor” decides how much of a fund of money to send to a “trustee.” The amount is tripled on the way to the trustee, and the trustee then decides what fraction to repay to the investor. The interaction is repeated ten times in each session. Previous studies had shown that the social game produces in normal people characteristic patterns of neural activity in the cingulate cortex, a region involved in higher brain activity.

The researchers found that, while people with ASD played the game the same as normal controls, the pattern of activity in their cingulate cortex

indicated a diminished perception of themselves in a social interaction. The abnormality arose at the so-called “self” point in the game, where they were deciding how much to invest, and their brains were thus representing the social intent of their own behaviors.

The activity pattern seen in people with ASD during the game resembled the pattern seen in normal people when they played against a computer, in the absence of a social partner, noted the researchers.

The researchers concluded that their ability to quantify brain activity in people with ASD “may serve as a diagnostic tool, identify subtypes of autism, or be used to seek covariates in genetic databases.” They wrote that “the present data suggest that a quantitative analysis of neural responses on tasks as simple as video watching may be of diagnostic and therapeutic utility.” They suggested that the measurements they developed could be used in therapy to increase the ability of people with ASD to represent themselves in social interactions.

In a preview in the same issue of *Neuron*, Chris and Uta Frith wrote, “This is an exciting result because it suggests that some mechanisms of social interaction are intact in these high-functioning cases. What is the critical difference between the self phase and the other phase? We believe that the simple distinction of self versus other is not adequate.

“It involves higher-order mentalizing: you care what another person thinks of you, and even further, you care that the other person trusts you. You would not do this when playing against a computer. In autism there is no difference,” wrote the Friths, who are at University College London.

Source: Cell Press

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