

A new light on the brains of people with borderline personality disorder

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In a game of give and get, the brains of people with borderline personality disorder often don't get it.

In fact, an interactive economic game played between two people in functional magnetic resonance imaging (fMRI) devices revealed a brain malfunction associated with the disorder, a serious but common mental illness that affects a person's perceptions of the world and other people, said researchers from Baylor College of Medicine in a report that appears in the current issue of the journal *Science*.

"This may be the first time a physical signature for a personality disorder has been identified," said Dr. P. Read Montague, professor of neuroscience at Baylor College of Medicine and director of the BCM Brown Foundation Human Neuroimaging Laboratory.

In the study, directed by Dr. Brooks King-Casas, assistant professor of neuroscience and psychiatry and behavioral sciences at BCM and a member of the College's new Computational Psychiatry Unit, 55 people with borderline personality disorder played a "trust" game with 55 normal people of the same age and social and educational status.

In the game, one player called an investor sends \$20 to the other called a trustee. The investment is tripled, and the trustee splits the profits with the investor. The trustee decides how much to send back, thus determining whether the investor recoups a profit or not. Profit requires cooperation between trustee and investor.

Both investor and trustee play the game while their brains are scanned by functional MRI devices through use of software called hyperscanning. The fMRI shows areas of blood flow in parts of the brain during the interaction between two people.

In this study, activity in an area of the brain called the anterior insula, known to respond when "norms" are violated, showed up on the scans. In the normal people, the anterior insula showed activity that responded in direct proportion to the amount of money sent and the money received. However, in people with borderline personality disorder, that part of the brain responded only to sending the money – not to the money received.

The scan casts a new light on the neurobiology of borderline personality disorder, said King-Casas, the study's lead author. Some day, he said, it could be used as a diagnostic tool or even a way to determine the effectiveness of a treatment.

"For the first time, to my knowledge, we have a specific brain association for people with a personality disorder," said Dr. Stuart Yudofsky, chair of the Menninger Department of Psychiatry and Behavioral Sciences at BCM. "It's new and different because it's not a lesion (or injury to the brain) but it is a difference in perceiving information that comes from an interaction." That is the area where people with borderline personality disorder have the most problem.

People with borderline personality disorder suffer from an inability to understand the actions of others. They frequently have unstable relationships, fly into rages inappropriately, or become depressed and cannot trust the actions and motives of other people.

"It's important that this biological signature has been identified," said King-Casas. "It's not just a matter of bad attitudes or a lack of will."

Yudofsky agrees that the finding may help eliminate the stigma associated with such disorders. The finding will help in three areas:

- Diagnosis by giving a biologic measure that can be used to determine if a person has the problem.
- Treatment using this brain-based difference to devise cognitive interventions or even medications that will affect the brain reactions.
- Monitoring the effectiveness of treatment by determining how the brain's dysfunctional responses to the input from others change with treatment.

"We have great strength in the area of personality disorders through our relationship with The Menninger Clinic," said Yudofsky.

Source: Baylor College of Medicine

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