Activation of brain region predicts altruism

January 21 2007

Duke University Medical Center researchers have discovered that activation of a particular brain region predicts whether people tend to be selfish or altruistic.

"Although understanding the function of this brain region may not necessarily identify what drives people like Mother Theresa, it may give clues to the origins of important social behaviors like altruism," said study investigator Scott A. Huettel, Ph.D., a neuroscientist at the Brain Imaging and Analysis Center.

Results of the study appear Sunday, Jan. 21, in the advance online edition of *Nature Neuroscience* and will be published in the February 2007 print issue of the journal.

Altruism describes the tendency of people to act in ways that put the welfare of others ahead of their own. Why some people choose to act altruistically is unclear, says lead study investigator Dharol Tankersley, a graduate student in Huettel's laboratory.

In the study, researchers scanned the brains of 45 people while they either played a computer game or watched the computer play the game on its own. In both cases, successful playing of the game earned money for a charity of the study participant's choice.

The researchers scanned the participants' brains using a technique called functional magnetic resonance imaging (fMRI), which uses harmless magnetic pulses to measure changes in oxygen levels that indicate nerve

cell activity.

The scans revealed that a region of the brain called the posterior superior temporal sulcus was activated to a greater degree when people perceived an action -- that is, when they watched the computer play the game -- than when they acted themselves, Tankersley said. This region, which lies in the top and back portion of the brain, is generally activated when the mind is trying to figure out social relationships.

The researchers then characterized the participants as more or less altruistic, based on their responses to questions about how often they engaged in different helping behaviors, and compared the participants' brain scans with their estimated level of altruistic behavior. The fMRI scans showed that increased activity in the posterior superior temporal sulcus strongly predicted a person's likelihood for altruistic behavior.

According to the researchers, the results suggest that altruistic behavior may originate from how people view the world rather than how they act in it.

"We believe that the ability to perceive other people's actions as meaningful is critical for altruism," Tankersley said.

The scientists suggest that studying the brain systems that allow people to see the world as a series of meaningful interactions may ultimately help further understanding of disorders, such as autism or antisocial behavior, that are characterized by deficits in interpersonal interactions.

The researchers are now exploring ways to study the development of this brain region early in life, Tankersley said, adding that such information may help determine how the tendencies toward altruism are established.

Source: Duke University Medical Center