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Hormone level predicts how the brain processes social information

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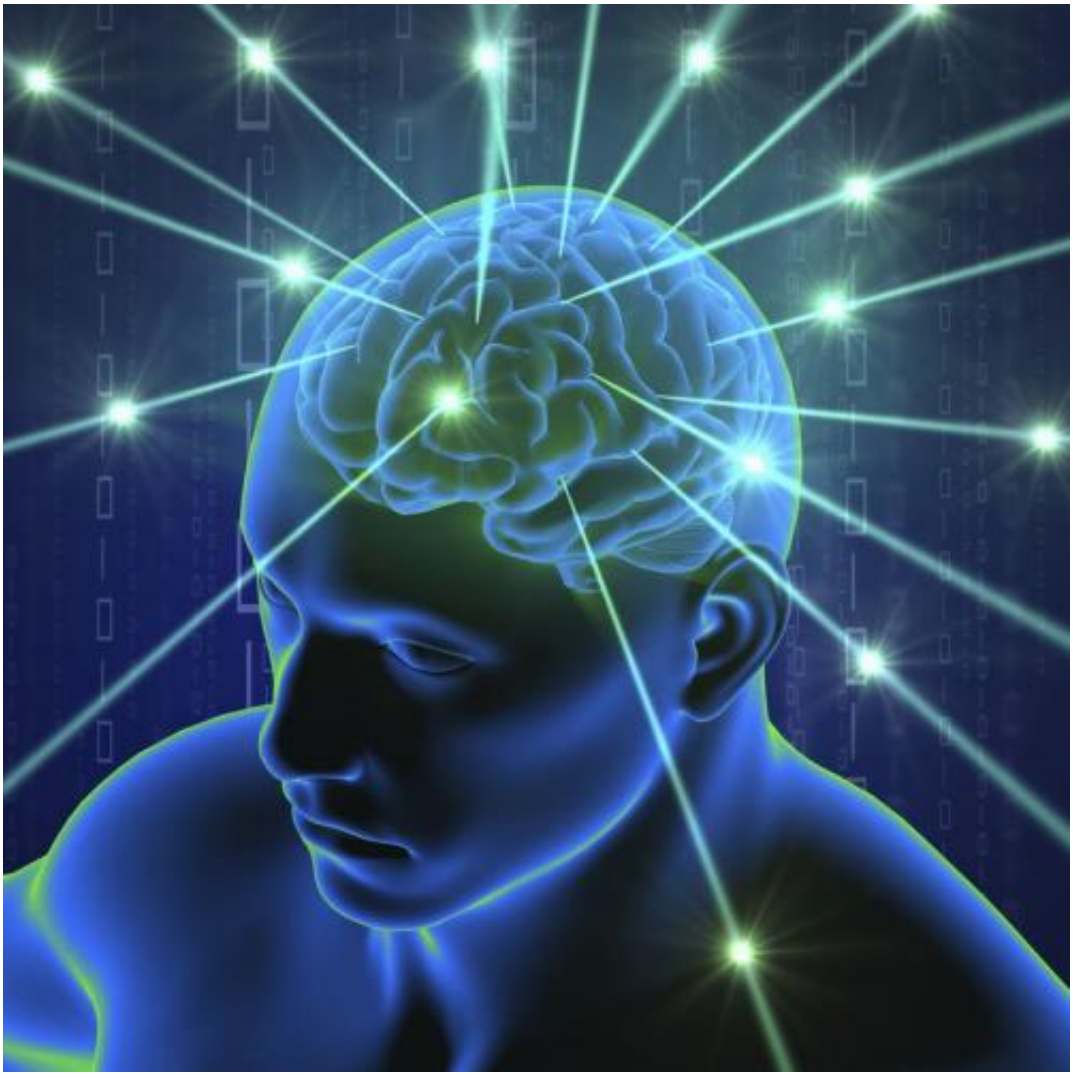

Credit: Rice University

The hormone oxytocin is made at different levels in different people and it plays a role in regulating social behavior. A new University of Virginia study involving brain imaging finds that people with naturally higher levels of oxytocin in their blood show greater brain activity when processing social information.

"The purpose of the study was to investigate how people's endogenous levels of oxytocin were related to brain activity when they viewed social interactions," said Katie Lancaster, a Ph.D. candidate in psychology at the University of Virginia and first author of the study. "We found that people with higher oxytocin levels showed greater recruitment of brain regions that support social cognition, suggesting that these people are naturally attending to the more social aspects of the interactions.

"People with low levels of oxytocin showed less recruitment of these 'social brain' areas; their brain activity resembles the patterns of neural activity previously observed when people focus on non-socially relevant information."

The study has implications for better understanding how oxytocin interacts with cognition in both healthy people and people with disordered social behavior. For example, low levels of oxytocin have previously been associated with social deficits often found in individuals with autism spectrum disorders.

The results, published in the journal *Frontiers in Human Neuroscience*, provide a potential mechanism to explain how lower levels of oxytocin might impact neural systems that support complex social behaviors.

The research team behind the study was led by James Morris and Jessica Connelly, both U.Va. assistant professors of psychology, and their collaborator, oxytocin researcher C. Sue Carter, director of the Kinsey Institute at Indiana University.

As part of a larger neuroimaging study, the team measured brain activity while participants completed a social perception task. This task involved watching film clips of geometric shapes interacting in ways resembling dancing, fighting and other social activities. When healthy people watch these film clips, they generally perceive the shapes to have intentions and personality characteristics even though they are just simple geometric shapes; this natural anthropomorphizing is disrupted in people with autism.

The researchers also took blood from participants to determine their levels of oxytocin and relate it to brain activity from the social perception task.

"Our results suggest that people with higher oxytocin levels are processing social information in a different way, perhaps deeper, more meaningfully," Lancaster noted. "Because people's endogenous oxytocin levels are remarkably stable over time and are highly heritable, we believe that endogenous oxytocin can be used as a biomarker of social perceptual functioning."

More information: "Plasma oxytocin explains individual differences in neural substrates of social perception." *Front. Hum. Neurosci.*, 17 March 2015 | DOI: 10.3389/fnhum.2015.00132

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