

Brain study sheds light on how children with autism process social play

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Brain scans confirm significant differences in play behavior, brain activation patterns and stress levels in children with autism spectrum disorder (ASD) as compared with typically developing children.

In a first-of-its-kind study, researchers at Vanderbilt University examined social play exchanges on multiple levels, revealing associations among brain regions, behavior and arousal in [children](#) with ASD. The results were released in the journal *Social Cognitive Affective Neuroscience*.

"Play is a fundamental skill in childhood and an area in which children with autism often have difficulty," said the study's principal investigator, Blythe Corbett, Ph.D., associate professor of Psychiatry and a Vanderbilt Kennedy Center investigator. "However, the psychobiological study of [play](#) in autism is seldom comprehensively investigated using multiple levels of analysis."

Corbett and colleague Kale Edmiston studied children with ASD using an innovative study design in which participants played with a typically developing child on a playground and then played a social exchange game with either the same child or a computer partner during functional imaging. To measure physiological arousal, salivary cortisol sampling was used before and after the playground protocol.

During a functional MRI (fMRI) scan, participants played a game in which they were asked to cooperate or to compete with a co-player. For half of the game, participants were told they were playing with a child they had just met on the playground. For the other half of the game, children were told they were playing with a computer. However, the children were actually playing with a computer the entire time.

"When participants with ASD were in the MRI scanner and thought they were playing with the child they had just met, their [brain activation patterns](#) did not differ from when they thought they were playing with a computer," said Edmiston, who is completing a doctorate in the Vanderbilt Brain Institute Neuroscience Graduate program. "In contrast, typically developing children showed unique activation patterns based on

which partner they were playing. This suggests that social agents might not be processed in the brains of people with ASD differently than nonsocial agents."

Corbett said the findings suggest that "some children with autism not only find social engagement with peers less motivating, but it may be stressful, even aversive."

Other ongoing research in Corbett's Social Emotional NeuroScience Endocrinology (SENSE) Lab found that these behavioral and neural responses can be modified by some forms of peer-mediated treatment, including SENSE Theatre, an intervention program developed by Corbett.

Provided by Vanderbilt University Medical Center

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