

Study suggests link between autism, pain sensitivity

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Credit: University of Texas at Dallas

New research by a UT Dallas neuroscientist has established a link between autism spectrum disorder (ASD) and pain sensitivity.

The study, led by Dr. Xiaosi Gu, outlines alternations in pain perception faced by people on the autism spectrum and how those changes can affect them in social functions.

"This provides some of the first evidence that links pain perception to social function in ASD. Most experiments on ASD focus either on the social dysfunction aspects or the sensory dysfunction aspects. But very few studies have looked at them both," said Gu, assistant professor in the School of Behavioral and Brain Sciences.

Published in the *European Journal of Neuroscience*, the study focused on a very specific aspect of sensory processing—[pain perception](#), with a goal of determining what happens in the brains of high-functioning adults with ASD when they anticipate and feel pain sensations.

The researchers used a stimulation device to

deliver mild electrical shocks to the participants, who decided how much pain they were willing to tolerate. The shocks were delivered while the subjects were inside an MRI scanner, so that researchers could measure [brain](#) activity and physiological responses when participants anticipated pain and when they experienced it.

One of the areas in the brain known to encode anticipation of pain is the anterior cingulate cortex (ACC). As participants waited in the scanner before receiving a pain signal, researchers could see this part of the brain light up.

Gu said there were three main findings from the study:

- It confirmed that people with ASD are hypersensitive to pain, a finding that has been documented in previous studies.
- In a new finding, the study showed that when people with ASD anticipate painful stimulus, their brains generate greater neural responses in the ACC, compared to those without ASD.
- In addition, the research indicated that the more brain activity the participants show during pain anticipation, the less they score on an empathy quotient questionnaire. Gu said people with autism often are poor at empathy, which is the ability to understand what another person may be feeling. This result indicates that pain anticipation is related to social impairments faced by those with autism.

She said that a withdrawal from interactions may be a way of protecting oneself.

"The risks of encountering pain are part of daily life and are normal for non-ASD individuals, but may be overwhelming for autistic people," Gu said. "Therefore, one possible explanation of our finding is that to protect themselves, individuals with ASD

may not engage in social interactions as much. You reduce the risk of encountering pain or other sensory experiences that are very normal for non-ASD individuals, but not for those with ASD."

Based on the study results, Gu said that therapists and experts who work with people with ASD should consider developing interventions and treatment options to help with sensory processing, particularly [pain](#).

More information: Xiaosi Gu et al. Heightened brain response to pain anticipation in high-functioning adults with autism spectrum disorder, *European Journal of Neuroscience* (2017). [DOI: 10.1111/ejn.13598](#)

Provided by University of Texas at Dallas

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