

# **A frown or a smile? Children with autism can't discern**

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When we have a conversation with someone, we not only hear what they say, we see what they say. Eyes can smolder or twinkle. Gazes can be direct or shifty. “Reading” these facial expressions gives context and meaning to the words we hear.

In a report to be presented May 5 at the International Meeting for Autism Research in Seattle, researchers from UCLA will show that children with autism can’t do this. They hear and they see, of course, but the areas of the brain that normally respond to such visual cues simply do not respond.

Led by Mari Davies, a UCLA graduate student in psychology, and Susan Bookheimer, a professor of psychiatry and biobehavioral sciences at the Semel Institute for Neuroscience and Human Behavior at UCLA, the research compared brain activity between 16 typically developing children and 16 high-functioning children with autism. While undergoing functional magnetic resonance imaging (fMRI), both groups were shown a series of faces depicting angry, fearful, happy and neutral expressions. In half the faces, the eyes were averted; with the other half, the faces stared back at the children.

With the typically developing group, the researchers found significant differences in activity in a part of the brain called the ventrolateral prefrontal cortex (VLPFC), which is known to play a role in evaluating emotions. While these children looked at the direct-gaze faces, the VLPFC became active; with the averted-gaze pictures, it quieted down.

In contrast, the autistic children showed no activity in this region of the brain whether they were looking at faces with a direct or an indirect gaze.

“This part of the brain helps us discern the meaning and significance of what another person is thinking,” Davies said. “When responding to someone looking straight at you, as compared to someone who’s looking away, the brain discerns a difference. When the other person looks away, the brain quiets down.”

For instance, with angry expressions, the brain may quiet down, because when a negative gaze is averted, it is no longer seen as a direct threat.

“Gaze has a huge impact on our brains because it conveys part of the meaning of that expression to the individual. It cues the individual to what is significant,” Davies said.

While the results show the key role of eye gaze in signaling communicative intent, it also shows that autistic children, even when gazing directly into someone’s eyes, don’t recognize visual cues and don’t process that information. That may be why children diagnosed with autism have varying degrees of impairment in communication skills and social interactions and display restricted, repetitive and stereotyped patterns of behavior.

“They don’t pick up what’s going on — they miss the nuances, the body language and facial expressions and sometimes miss the big picture and instead focus on minor, less socially relevant details,” Davies said. “That, in turn, affects interpersonal bonds.”

Source: University of California - Los Angeles

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