

Social Behavior Differs in Children With Family History of Autism, Study Finds

Inga Kiderra

May 4, 2007

Dad looks on as a baby subject is fitted with an ERP cap at UC San Diego's Developmental Cognitive and Social Neuroscience Lab. Courtesy of Leslie Carver, UCSD

The baby brothers and sisters of autistic children do not seek emotional cues from adults, or respond to them, as often as other toddlers do, suggests new research from the University of California, San Diego.

The study is the first to investigate "social referencing" behavior in children from families at high risk for autism and also points to profound differences in related measurements of brain activity, said lead researcher Leslie Carver.

Carver, an assistant professor of psychology and director of the Developmental Cognitive and Social Neuroscience Lab at UC San Diego, is presenting the findings at the 2007 International Meeting for Autism Research in Seattle, Wash.

"Our results," Carver said, "support two important ideas about autism: That those behaviors that are diagnostic of the disorder fall on one end of a broad behavioral spectrum and also that there is a strong genetic component to autism, evidenced by the behavioral resemblances in close family members."

The heritability of autism has been estimated as high as 90 percent, Carver noted, and siblings are at increased risk of receiving the diagnosis themselves: About 8 percent will go on to develop the disorder, as compared to about .5 percent of the general population.

Social referencing involves checking in with the emotional displays of others (especially those we expect to be knowledgeable about a novel situation) and regulating our own emotions and behavior in response. It is something most of us do and do without thinking. On spying a new caterpillar in the park, a young child might turn to find a parent's smile before toddling over to take a closer look. And an adult, startled by a sudden jolt on an airborne plane, might seek out the expression of a flight attendant to determine whether that was just a nasty bit of turbulence or something really worth worrying about.

Typically, social referencing begins to emerge toward the end of the first year of life. But in individuals with autism, this behavior, along with several other aspects of social cognition, is characteristically impaired.

The current research is in line with earlier work demonstrating that first-degree relatives of autistic children often display milder, or subclinical, features of the disorder.

Carver and her colleagues, UC San Diego psychology professor Karen Dobkins, doctoral student Lauren Cornew and post-doctoral researcher Joseph McCleery, tested 18 high-risk toddlers (18-month-old siblings of children diagnosed with autism) and compared their results to those of 28 age-matched counterparts who had no family history of the disorder.

In the behavioral portion of the experiments, the children were presented with three novel and ambiguous toys - toys that could be taken as either good or bad, scary or fun, or neither - and their caregivers were trained to react with facial expressions and vocal signals that were positive, negative and neutral. The interactions were videotaped and later analyzed.

After the behavioral testing, the children were shown pictures of the same toys and their brain responses were measured - specifically by tracking ERP (event-related potential) activity, or the electrical activity of groups of neurons firing in synchrony in response to a specific event.

The high-risk toddlers differed in almost every element of social referencing, the researchers found: Though they sought emotional information from adults as quickly as the low-risk toddlers, they did so about 30 percent less frequently, and they did not respond to the adult's information in ways that were consistent with the adult's reaction.

Brain-activity measurements told a similar story: Where low-risk children showed the expected magnitude of neural response to emotionally tagged objects, the high-risk ones did not. And where the brain activity of low-risk children correlated with their behavior regulation, this pattern was not observed in the high-risk.

"It's as if the high-risk children do not have as clear an understanding of the meaning of an emotion and don't connect it to the object in the same way," Carver said.

Data from children who would later go on to a diagnosis of autism are not included in the study results.

The study is supported by funding from the National Association for Autism Research, Autism Speaks and the MIND Institute at UC Davis.

Media Contact: Inga Kiderra, 858-822-0661

