Toddlers' focus on mouths rather than on eyes is a predictor of autism severity

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Two-year-olds with autism look less at others' eyes and more at their mouths. Credit: Yale University

Scientists at Yale School of Medicine have found that two-year-olds with autism looked significantly more at the mouths of others, and less at their eyes, than typically developing toddlers. This abnormality predicts the level of disability, according to study results published in the

Archives of General Psychiatry.

Lead author Warren Jones and colleagues Ami Klin and Katelin Carr used eye-tracking technology to quantify the visual fixations of two-year-olds who watched caregivers approach them and engage in typical mother-child interactions, such as playing games like peek-a-boo.

After the first few weeks of life, infants look in the eyes of others, setting processes of socialization in motion. In infancy and throughout life, the act of looking at the eyes of others is a window into people's feelings and thoughts and a powerful facilitator in shaping the formation of the social mind and brain.

The scientists found that the amount of time toddlers spent focused on the eyes predicted their level of social disability. The less they focused on the eyes, the more severely disabled they were. These results may offer a useful biomarker for quantifying the presence and severity of autism early in life and screen infants for autism. The findings could aid research on the neurobiology and genetics of autism, work that is dependent on quantifiable markers of syndrome expression.

"The findings offer hope that these novel methods will enable the detection of vulnerabilities for autism in infancy," said Jones, a research scientist from the Yale School of Medicine Interdepartmental Neuroscience Program and the Yale Child Study Center. "We hope this technology can be used to detect and measure signs of an emerging social disability, potentially improving a child's outcome. Earlier intervention would capitalize on the neuroplasticity of the developing brain in infancy."

Study collaborator Ami Klin, director of the Autism Program at the Child Study Center, said they are now using this technology in a large prospective study of the younger siblings of children with autism, who

are at greater risk of also developing the condition. "By following babies at risk of autism monthly from the time they are born, we hope to trace the origins of social engagement in human infants and to detect the first signs of derailment from the normative path," said Klin.

Jones and Klin are also engaged in parallel studies aimed at identifying the mechanisms underlying abnormal visual fixation in infants with autism. "Our working hypothesis is that these children's increased fixation on mouths points to a predisposition to seek physical, rather than social contingencies in their surrounding world. They focus on the physical synchrony between lip movements and speech sounds, rather than on the social-affective context of the entreating eye gaze of others," said Jones. "These children may be seeing faces in terms of their physical attributes alone; watching a face without necessarily experiencing it as an engaging partner sharing in a social interaction."

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