



UNUSUAL VISUAL INSPECTION OF OBJECTS

EARLY DIAGNOSIS OF AUTISM IN CHILDREN AS YOUNG AS NINE MONTHS OLD

This article is a review of the following research: Miller, M., Sun, S., Iosif, A. M., Young, G. S., Belding, A., Tubbs, A., & Ozonoff, S. (2021). Repetitive behavior with objects in infants developing autism predicts diagnosis and later social behavior as early as 9 months. *Journal of Abnormal Psychology*, 130(6), 665–675.

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by social communication deficits, as well as restricted and repetitive behaviors, interests or activities.¹

Social deficits can be seen early in many children with autism. These can include not making eye contact, preferring to play alone, and not responding to their name. However, abnormal repetitive behaviors are more difficult to detect since repetitive behaviors are a part of typical childhood development in the first year of life. This makes autism extremely difficult to diagnose in an infant. Many practitioners wait until toddlerhood to make a formal diagnosis to ensure that the behaviors are in line with autism spectrum disorder (ASD).

Even though autism is not typically diagnosed until toddlerhood or later, early detection is extremely important and can make a significant difference in an autistic child's life. When autism is diagnosed early in life, children can receive important supports during key developmental periods of growth. Research has shown that autistic children are more likely to gain social, emotional, and physical skills with early intervention.^{2,3}

Given the importance of early detection, it is worth asking if there are early repetitive behaviors that can help clinicians reach the diagnostic criteria needed to make an accurate diagnosis in infants.

Some studies have found that infants who later develop autism show higher levels of stereotyped motor mannerisms and repetitive movements at 12 months of age.^{4,5} Another study showed that 12-month-old children who later develop ASD inspect toys by spinning and rotating them, and by staring at toys for more time than their peers.⁶

A research team led by Dr. Sally Ozonoff wanted to build on these findings and investigate if there are any repetitive behaviors that could be identified in autistic children before their first birthday. The team also sought to determine what relationship these repetitive behaviors have with social engagement.

Study

Study participants were either infant siblings of children with autism, or high risk, or infant siblings of typical development, or low risk. Each child was evaluated at 9, 12, 15, 18, 24 and 36 months of age. In each evaluation, children were given four different toys or objects to play with for 30 seconds each. After each toy had been presented individually, all the objects were presented together for 30 seconds. The clinicians watched for any unusual visual inspection of the toys. This would include: examination of the object from odd angles; squinting or blinking repeatedly while examining the object; and staring at an object uninterrupted for more than 10 seconds. They also watched to see if the children rotated the toy to examine it, or if they tried to spin it.

In addition, clinicians examined each infant's social engagement behavior at each time point. They measured the infant's frequency of eye contact, frequency of shared effect and overall social responsiveness. At the end of the 36-month trial, each child was categorized as being in one of three groups: low-risk non-ASD; high-risk non-ASD; and ASD.

Results

- As early as at nine months of age, children with autism had significant differences when presented with a toy. They engaged in 139 percent more unusual visual inspection of objects when compared to the low-risk non-ASD group. At 9, 12, 15, 18, 24, and 36 months of age, autistic infants more frequently examined objects from odd angles, squinted or blinked repeatedly while examining the object, and stared at an object uninterrupted for more than 10 seconds.
- Children with autism were found to rotate and spin their objects more than children without an autism diagnosis. However, this was not prominently seen at nine months of age but was more evident at 15 to 18 months of age.
- Children who had unusual visual inspections of objects at nine months of age showed low levels of social engagement three months later at age 12 months.

Conclusion

This study presents some interesting results. The researchers have identified an early marker and potential diagnostic tool for identifying autism in children as young as nine months of age. When paired with social deficits seen in autistic infants, this could be grounds for an earlier diagnosis of autism than at the standard two to four years old.

This research also highlights the fact that the unusual visual behaviors seen in playing with toys **predicts** which children will go on to develop social deficits. The finding implies that children with autism are focused on objects and toys instead of engaging with parents, siblings and peers, and that they miss key social development and engagement. This information could help clinicians and parents to introduce therapeutics that encourage and improve social development and engagement from a very young age.

This finding of unusual visual inspection of objects is the earliest behavioral predictor of autism yet documented, and could be a game-changer for diagnosticians. This study should be replicated using a larger sample size to confirm the results, but it is a promising finding for future generations.

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