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Academic Performance and Cognitive Abilities in Children with ASD

by Joel Schwarz

There is more to the IQ scores of high-functioning children with Autism Spectrum Disorders (ASD) than meets the eye when it comes to their performance on standard achievement tests. New research shows that the overwhelming majority of nine-year olds with ASD showed unexpected discrepancies between cognitive ability measured by IQ and academic achievement measured by standardized tests of reading, spelling, and mathematics. All children in this study were considered “high functioning” because they had IQ scores over 70. “Ninety percent of the children we studied had unusual academic strengths or weaknesses. Typically developing children don’t usually have these kinds of discrepancies,” said Annette Estes, Ph.D., a University of Washington research assistant professor of speech and hearing sciences and CHDD research affiliate.



Annette Estes and Philip Cali review findings of their research that looked at IQ scores of high functioning nine-year-old children with Autism Spectrum Disorders (ASD) and how they scored on standardized tests that measured reading, spelling, and mathematics.

The new research provides one of the first looks at how children with ASD are faring in school. Estes, who is also affiliated with the UW Autism Center, noted that increasing numbers of children with ASD are in regular classrooms because of successful early autism identification and early intervention programs that improve outcomes for children with ASD. Progress in education has allowed more children with ASD to participate in regular education settings, but she cautioned that “these kids have special needs. One size does not fit all for children with autism in the classroom. We think this research shows there is a risk of over- or under-estimating a child with autism. There may be mismatches in what children are expected to do in the classroom and what they are capable of doing.”

A group of 30 children, initially diagnosed with ASD when they were 3 to 4 years old and who were part of a larger on-going project at the UW Autism Center, participated in this new research. The academic achievement study looked at possible links between academics, cognition, level of social skills and problem behaviors. The researchers tried to make the study as inclusive as possible, but potential participants with IQ’s less than 70 had to be excluded because they were not able to be tested following the standardized testing requirements. The participants’ academic abilities were tested when they were nine years old and their social skills were rated at both six and nine years by their teachers and parents.

At age nine, 22 of the children were in regular school classrooms, five split their school days between special education and regular classrooms, and three were placed in mixed regular education/special education classrooms. The researchers found that 60 percent, or 18 of the children, tested higher than would be expected based on IQ levels on at least one of the tests, particularly spelling and word reading. However, 18 scored lower on at least one of the tests than what their IQ's would predict, suggesting a learning disability. The first finding surprised the researchers while the second did not. "It may have been our own bias, but clearly a lot of children with autism are struggling in school," said Estes. "The higher than predicted scores by so many of the kids was unexpected. That's because special skills, like those depicted in the movie the Rain Man, are very rare characteristics not often seen in autism."

The research also explored connections among social and problem behaviors and academic achievement. The study revealed somewhat unexpected effects of social skills and problems behaviors on academic achievement. The level of a child's social skills at age 6 predicted academic achievement at age 9, but social skills level measured at the same time as academic skills were not associated with each other. The reason for this is not clear, according to Estes, but it suggests that some early experiences may have a snowball effect on children with ASD. In this example, disrupted social functioning may have long-term effects on academic learning. But she cautioned that the data on this is not conclusive and needs to be further examined. Surprisingly, there was no correlation between levels of problem behavior and academic achievement as there is among typically developing children. "We don't know why this is. Somehow children with ASD are able to learn despite these behaviors. You would think problem behaviors would hinder learning."

The research has implications for interventions to assist children with ASD as well as a number of future directions for researchers to explore. Estes noted that while there is a focus on early intervention in ASD, outcomes in the kindergarten and elementary school years are understudied. "We may need interventions not just at two to four years of age, but perhaps there are other times throughout development when children with high functioning autism, especially those in inclusive programs, are not receiving help to the degree that they need," said Estes. One of the next steps according to Estes is to explore how these discrepancies may affect children's actual functioning in the classroom. "A child with ASD may be good at math according to our tests, but is that child getting an A on his or her report card? Right now we don't know how children are doing in the classroom. Federal law acknowledges a simple discrepancy on a test is not sufficient to diagnose a learning disability. You also must have corroboration from parents and teachers."

Because IQ is considered to be a very broad-brush measure of intelligence the researchers are looking at neuropsychological abilities, such as spatial working memory, that may contribute to academic achievement. "We think children with autism may have some specific neuropsychological functions they are very strong in and other areas that they are much weaker in than would be expected. We are investigating whether or not an uneven level of abilities is characteristic of autism," Estes said. In addition, Estes and her colleagues are starting to look at how academic achievement may impact the mental health of children with ASD. The subjects in the academic performance study are now adolescents. Research has shown that teens with ASD tend to experience higher rates of depression and anxiety than teens with typical development. Future studies will investigate whether academic discrepancies in the school years lead to higher rates of depression and anxiety in the teen years.

CHDD is an interdisciplinary center dedicated to the prevention and amelioration of developmental disabilities through research, training, clinical service, and community outreach. CHDD includes the University Center of Excellence in Developmental Disabilities and the Eunice Kennedy Shriver Intellectual and Developmental Disabilities Research Center.

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