NEWS

Autism features may vary with intelligence

BY **JESSICA WRIGHT**

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High intelligence, as measured by intelligence quotient (IQ), typically predicts good scores on tests of memory, facial recognition and other cognitive functions. This trend does not apply to children with autism, suggests a new study[1].

The study, published 7 October in *PLoS One,* shows that children with autism who have IQs below 85, the low end of the average IQ range, show cognitive problems similar to those of controls with equivalent IQs. But children with autism who have IQ scores higher than 115, the high end of the average range, do much worse on cognitive tests than do controls with similar IQs.

The findings suggest that low intelligence underlies cognitive deficits in only some children with autism. In children with autism who score well on IQ tests, these problems may stem from other origins entirely, says lead researcher **Nanda Rommelse**, associate professor of psychiatry at Radboud University in Nijmegen, the Netherlands.

If the results hold up, therapies that target cognitive skills may turn out to be especially beneficial to intellectually gifted children with autism.

The results also call into question the common conception that a high IQ equates to ‘mild autism,’ given the spectrum of cognitive problems that remain, says **Sarah White**, senior research fellow at University College London’s Institute of Cognitive Neuroscience, who was not involved with the study.

“This paper would caution against using such a term,” she says. “Rather, it indicates that autistic individuals with high IQs are actually purer cases of autism without additional difficulties.”

Decision tests:

Cognitive problems may explain some features of autism, such as difficulty reading emotions.

Rommelse and her team tested various cognitive abilities in 128 children with autism and 146 controls between 6 and 21 years of age. Across both groups, 52 children have below-average IQs. Half of the remaining 222 children have average IQs, and the other half have above-average IQs.

The researchers used a series of computer tasks to probe a basic range of cognitive functions, from face processing to working memory.

To test basic processing speed, for example, the researchers measured how quickly children could react when a cross on a screen changed into a white square. Children tapped their verbal working memory by trying to repeat a series of numbers in reverse order. Social cognition tests involved recognizing faces and inferring emotions from facial expressions and voices.

The researchers combined the scores from all the tests to calculate an overall score for each child.

Typically developing children with above-average IQs had the highest combined score, and, as expected, the scores dropped along with IQ. Among children with below-average IQs, those with autism had cognitive abilities similar to those of controls. But among children with above-average IQs, those with autism had substantially lower cognitive scores than controls did.

The findings suggest that intelligence scores signal cognitive problems only among children with autism who have a low IQ.

However, the study's conclusions rest on composite cognitive scores. The researchers did not see any statistically significant differences between children with autism and controls in the relationship between IQ and specific aspects of cognition, such as face recognition or working memory.

What's more, the results of both IQ and cognitive tests can be unreliable in people with autism, says White. IQ scores **are highly variable** in this population, and children with autism may struggle to understand the researchers' instructions in certain tests of cognitive function, leading to **artificially low scores**.

Rommelse plans to test the IQs and cognitive skills of all of the children again in a few years to assess how these scores change over time and how the two measures influence the children's symptoms over time. "We hope to plot trajectories to see if the children are improving on these cognitive symptoms, have stable deficits or are deteriorating," she says.

REFERENCES:

1. Rommelse N. *et al. PLOS One* **10**, e0138698 (2015) **PubMed**