OPINION

Study catches autism signs in ball skills

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21 OCTOBER 2014

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Catching a ball may seem like a purely physical task, but in fact the skill involved may highlight the social deficits characteristic of autism. A new study reports that children with the disorder are **more likely to have trouble with catching** a ball than their unaffected peers or those with attention deficit hyperactivity disorder (ADHD).

The findings, published 18 September in the *Journal of Autism and Developmental Disorders*, add to mounting evidence for motor impairments in autism. Children with autism tend to **score poorly on standard tests of movement** and have **delays in meeting motor milestones** such as sitting up and walking.

The new study takes this further by pinpointing the type of motor impairments that are characteristic of autism. More broadly, the researchers suggest that certain motor skills, such as catching, may draw on some of the same brain mechanisms that are also important for social skills.

To successfully catch a ball, a child has to track the trajectory of the ball and move to intercept it, so this simple task provides a test of the ability to integrate visual and motor cues. Visual-motor integration is also crucial for imitating others' gestures and actions, a skill that **people with autism are known to struggle with**. Several studies suggest that imitation helps young children develop social skills — in essence, we learn how humans act by aping others.

The new study tested a variety of motor skills, including the ability to throw and catch a ball,

balance and manual dexterity. The researchers tested 25 children with autism, 63 children with ADHD, 31 children with both disorders and 81 controls, all ranging in age from 8 to 13 years. Most of the participants were boys, but there were 8 girls with autism, 9 with ADHD alone and 12 among the controls.

Children who have difficulty catching are more likely to have autism, with or without ADHD, than children in the other groups. The findings **echo those of a smaller 2012 study**.

“We think that there’s converging lines of evidence, this study being one of them, that really support the idea that there may be a particular impairment in visual-motor integration in children with autism,” says **Stewart Mostofsky**, director of the Center for Neurodevelopmental and Imaging Research at the Kennedy Krieger Institute in Baltimore.

The researchers also found that children with autism struggle with balance, which requires visual-motor integration as well as other forms of sensory feedback. Mostofsky’s group has shown that the **visual and motor areas of the brain are poorly connected** in children with autism, and weak connectivity tracks with the severity of autism symptoms.

Bolstering the link between visual-motor integration and autism, another study reports that peoplewith autism show less activation than controls do in the superior parietal lobule **when learning a sequence of movements**. Decreased activation in this brain area, which is involved in visual-motor integration, is associated with more severe **repetitive behaviors**. That study was published 24 September in *Autism Research*.

People with ADHD are also thought to have motor impairments, but this link is less consistent. The new study found that children with ADHD, with or without autism, don’t do as well as the other groups in a test of manual dexterity, in which they have to pick up small plastic pegs, turn them over with one hand and replace them in the holes of a pegboard. This suggests that autism and ADHD, **which often overlap**, bestow distinct motor impairments.

Mostofsky and his team aim to help children with autism learn to imitate others’ movements by using videos to show movements in slow motion. The videos would gradually speed up as the children’s skills improve.

One of the most puzzling aspects of autism is the appearance of seemingly disparate symptoms in the same individuals. The study tested something small and specific — the ability to catch a ball — but the results suggest that certain autism traits, such as motor and social impairments, may not be so disparate after all.