

NEWS

Girls on the spectrum may have problems with planning

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Girls with autism have more difficulty making and executing plans than do boys with the condition, a new study suggests. They also have relatively poor daily-living skills, such as personal hygiene, cooking and using public transportation¹.

The results suggest that **girls with autism** would benefit from therapies to improve their adaptive function, or daily-living skills, and executive function — including the ability to process information and to set goals and see them through.

“[Executive function] has everything to do with how you show what you know, and how you act on your knowledge,” says lead researcher **Lauren Kenworthy**, director of the Center for Autism Spectrum Disorders at Children’s National Health System in Washington, D.C. “These skills are absolutely trainable.”

The findings may also help researchers understand autism’s presentation in girls. “We have very little data defining what autism looks like in folks who aren’t male,” Kenworthy says. This lack of information can cause girls with autism to **go without a diagnosis** and the treatment they need.

The study is the largest yet to focus on sex differences in executive function and daily-living skills — traits that do not show a gender difference in typical children.

“This is a nice study in the sense of aiming to understand functional impairment that might be especially significant in females,” says **Connie Kasari**, professor of human development and psychology at the University of California, Los Angeles, who wasn’t involved with the study.

Daily difficulties:

Kenworthy and her team used two parent questionnaires to probe executive and adaptive function in 79 girls and 158 boys who met the clinical criteria for autism. The participants ranged in age from 7 to 18 and were matched for intelligence, age and autism severity.

One questionnaire, the Behavior Rating Inventory of Executive Function, probes a child's ability to make and adjust plans, and remember and organize information. The other, the Vineland Adaptive Behavior Scales, measures a child's performance in daily activities, such as getting dressed. It also gauges a child's communication and social skills.

Girls with autism fared worse than boys on both assessments, according to the study, published 1 June in *Autism Research*. On average, girls' scores on the executive function tests indicated clinically significant problems in planning, working (short-term) memory, impulse control and **cognitive flexibility** — the ability to switch from one activity to another. The boys' have clinically significant problems with only cognitive flexibility.

"We didn't expect the severity and significance of the difference would be as great as we saw," Kenworthy says.

In the second test, the gender gap applied only to the daily-living skills, in which girls scored an average of about 78 compared with the boys' 85. Boys and girls showed no statistically significant difference in communication or social skills.

The results held up even when the researchers controlled for age, intelligence, autism severity and the presence of attention deficit hyperactivity disorder.

Real-world skills:

Previous studies looking at executive function in girls with autism were small and based on standard tests used at a clinic. Parent questionnaires "get at the real-world autistic planning and organization problems," says **William Mandy**, senior lecturer in clinical psychology at University College London, who was not involved in the study.

The differences seen in the study could at least partly reflect a bias in how girls are diagnosed with autism, Mandy says.

Scientists should investigate whether parents' perceptions of their child's executive function and daily-living skills apply to different environments, such as school. "When kids are older and in real-world environments, you might see how they truly adapt," Kasari says.

The researchers have developed a school-based treatment called "Unstuck and on target." It involves teaching children with autism skills such as goal-setting, flexibility and planning. In a randomized trial of 67 children with autism, the strategy improved children's executive function and

social skills, as reported by parents, teachers and the children themselves².

REFERENCES:

1. White E.I. *et al.* *Autism Res.* Epub ahead of print (2017) [PubMed](#)
2. Kenworthy L. *et al.* *J. Child Psychol. Psychiatry* **55**, 374-383 (2014) [PubMed](#)