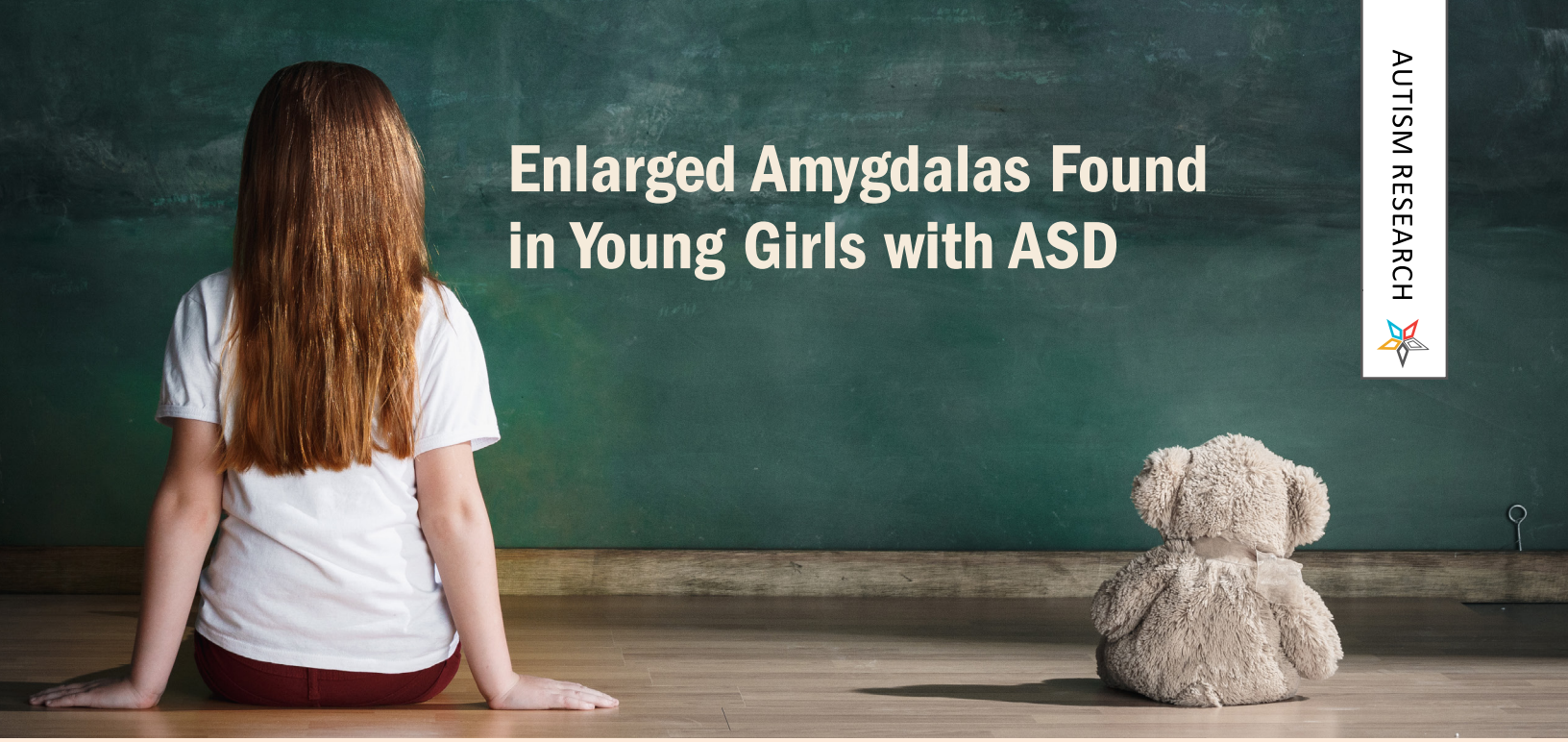


Enlarged Amygdalas Found in Young Girls with ASD

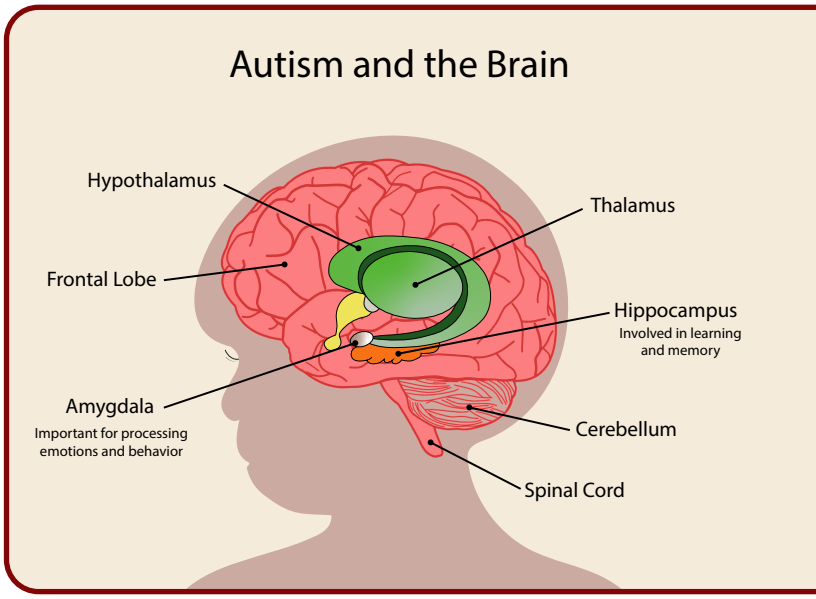
AUTISM RESEARCH

This article is a review of the following research: Nordalh, C.W., Iosif, A.M., Young, G.S., et al. (published online ahead of print, 2020 Jan 20). High Psychopathology Subgroup in Young Children With Autism: Associations With Biological Sex and Amygdala Volume. *Journal of the American Academy of Child and Adolescent Psychiatry*. S0890-8567(20)30018-6. doi: 10.1016/j.jaac.2019.11.022

The University of California, Davis, founded the UC Davis MIND Institute in 1988. Located in Sacramento, California, it leads research in Autism, Fragile X Syndrome, ADHD and Down Syndrome. A team of researchers from this institute, led by Christine Wu Nordahl, was able to uncover novel information regarding females and autism spectrum disorder (ASD).

Females are often underrepresented in autism research because there is a male bias in individuals with ASD. It is reported that for every one female diagnosed with autism, there are four males diagnosed. Very little is known about the biological similarities and differences between females with ASD and males with ASD.

It is important that research uncover the mysteries surrounding this gender bias. The more information we have, the better we can offer specific treatment to both males and females with ASD.



The Study

Nordahl and her colleagues investigated the amygdala in young females and males with ASD (ages 2 to 3.5 years old). The amygdala is located in the brain's temporal lobe and is responsible for emotions and survival instincts. Previous autism research has focused on the amygdala as ASD often presents with unregulated emotions.

Nordahl had two goals in mind:

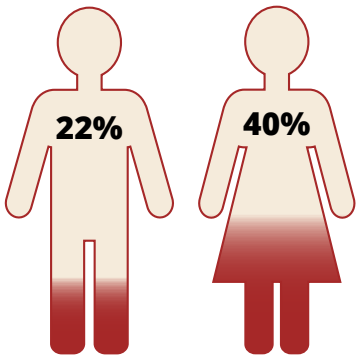
GOAL 1	GOAL 2
Identify signs of anxiety and depression (emotional disorders) in young children, and determine if girls and boys are affected at the same rate.	Investigate the size of the amygdala and determine if there is a correlation with the emotional dysregulation of an ASD child (male or female).

The study participants were categorized into three behavioral groups: children with severe behavior problems; children with low behavior problems and little impairment (IQ, function and autism severity); and children with low behavior problems and high impairment.

The Results

1. The team found that 40 percent of young ASD females presented with a co-occurring emotional disorder, compared to only 22 percent of the boys. In other words, girls with autism are more likely than boys with autism to have mood disorders such as depression and anxiety. The team found it alarming that these disorders occurred at such a young age. Evidence from other research suggests that adolescent and adult females with ASD have higher rates of mood disorders than their male counterparts.[1] This study is evidence that these mood disorders begin as early as two to four years of age.

Forty percent of young ASD females presented with a co-occurring emotional disorder, compared to only 22 percent of the boys.



2. Through magnetic resonance imaging (MRI), the researchers were able to determine that the female participants with severe behavior problems had statistically larger amygdalas. There was no relationship with males, or with females that had low behavior problems. Nordahl believes that the larger amygdala directly relates to the fact that ASD young females are exhibiting an increase in emotional dysregulation. Interestingly, John Herrington (Children's Hospital of Philadelphia) previously found that ASD children (ages 7 to 17) have smaller amygdalas.[2] Nordahl and her team plan to test and scan the study participants into middle childhood and adolescence, as this is typically when emotional conditions, such as depression and anxiety, become obvious. Her team also plans to identify if the amygdala remains enlarged or, as Herrington's research suggests, if it decreases in relative size as a child ages.

What does this mean for me?

This research is significant because it begins to unravel some of the biological differences between females and males with autism.

These findings will be most helpful for parents with a young female diagnosed with autism who also displays severe behavior problems. It is likely that the child is experiencing multiple conditions. Perhaps some of the exhibiting behaviors can be addressed as anxiety, depression or another mood disorder, and not exclusively as "autism." This is important as treatment for anxiety and depression is different from that directed at autism. Also, with early detection, professionals and parents will be able to intervene in a timely way to address the emotional disorders.

Depression and anxiety are difficult for even the most resilient adults. It is our responsibility to do everything we can to help and support young children facing this challenge and raise them to be strong and capable of overcoming it.

References

1. Kreise, N.L., White, S.W. ASD Traits and co-occuring psychopathology: the moderating role of gender. *Journal of Autism and Develepmental Disorders*. 2015;45:3932-3938

2. Herrington, J.D., Maddox, B.B., Kerns, C.M., Rump, K., Worley, J.A., Bush, J.C., McVey, A.J., Schultz, R.T., Miller, J.S. Amygdala Volume Differences in Autism Spectrum Disorder Are Related to Anxiety . *Journal of Autism and Developmental Disorders*. 2017;12:3682-3691

Written by Autism Advocate Parenting Magazine