



Misunderstood Girls: A look at gender differences in Autism

By Lauren Lowry
Hanen Certified SLP and Clinical Staff Writer

Several years ago I worked on a diagnostic assessment team. I remember the first time I assessed a little girl with suspected autism spectrum disorder (ASD). Before the assessment, the developmental pediatrician on our team alerted me to the fact that “girls can be tricky”. I wasn’t really sure what she meant, but was sure to pay extra attention to the little girl’s behaviour and skills.

Sometime later, after assessing several girls, I started to figure out what she meant when she said “tricky.” Girls with ASD don’t always present in the same way that boys do. While the core symptoms of autism are present, there are sometimes subtle differences in the way these symptoms manifest themselves.

Because ASD is much more prevalent in males than females (4.3:1), much more attention has been paid to how it manifests in males (Van Wijngaarden-Cremers, van Eeten, Groen, Van Deurzen, Oosterling, & Van der Gaag, 2014). Recently though, researchers have started to look at gender differences in the core symptoms of ASD, but it’s been difficult to draw conclusions due to:

- Small sample sizes (and particularly small samples of females)
- Reliance on retrospective reporting after a long time lapse
- The inclusion of children with comorbid intellectual impairment

(Hiller, Young, & Weber, 2014)

In order to bring clarity to this issue, two recent studies investigated gender differences in ASD symptomology, but in different ways:

- **Van Wijngaarden-Cremers et al. (2014)** conducted a meta-analysis of 22 studies pertaining to gender differences in ASD in order to draw comparisons across studies
- **Hiller et al. (2014)** eliminated some of the methodological issues mentioned above by examining a larger sample of girls and boys with high functioning ASD, looking at their current abilities and thereby avoiding retrospective reporting and comorbid intellectual impairment

Van Wijngaarder-Cremers et al., (2014)

These researchers reviewed and analyzed 22 studies about gender differences in the core symptoms of autism. They hoped that a better understanding of the clinical presentation of autism in girls may lead to earlier identification and treatment (Van Wijngaarder-Cremers et al., 2014). The review included a total of 4,195 participants, 988 of which were females. The researchers analyzed their findings according to five age groups (toddler, preschooler, children, adolescents, and adults) in order to determine if gender differences were observed at specific ages.

The researchers' main findings were:

- **Males and females demonstrated similar symptom severity in terms of communication and social behaviour**
- **After the age of 6, girls demonstrated fewer restricted interests and behaviours and stereotypes than boys. But before the age of 6, boys and girls demonstrate similar levels.**

They suggest some possible theories to explain these findings:

- **Females with ASD may have a different autistic phenotype than males** – Autism may manifest differently in girls and they may truly have less restricted interests and behaviours than boys. This could be due to different genetic variants and/or and environmental factors. This would explain the many observations of differences between boys and girls with ASD, such as girls having stronger imaginative play, more interest in social relationships, and more socially acceptable special interests (such as horses, dolls, pop stars). Some of these factors may mask their diagnosis (Van Wijngaarder-Cremers et al., 2014).
- **High-functioning females may have been missed in the meta-analysis** – girls with normal IQ and milder symptoms tend to be diagnosed at a later ages than boys, and some are misdiagnosed with anxiety disorder, avoidant personality disorder, etc. (Van Wijngaarder-Cremers et al., 2014). Therefore, the studies included in the meta-analysis may have missed this group of girls. If this was the case, then the finding that males and females demonstrate the same level of impairment in communication and social behaviour would be inaccurate, and it may be that females show better social and communication skills than males.
- **Females with low IQ included in the meta-analysis may be overrepresented compared to male subjects with low IQ, and this could have affected the results** – when ASD is accompanied by intellectual impairment, the ratio of affected females to males is 1:2. And when looking at individuals with ASD without intellectual impairment, the ratio of females to males is almost 1:10 (Van Wijngaarder-Cremers et al., 2014). The authors note that the studies in the meta-analysis may have included only females with

intellectual impairment, and therefore females with ASD and low IQ may be overrepresented compared to males with ASD and low IQ.

Furthermore, restricted interests and behaviours and stereotypes can be present in individuals with intellectual impairment. Therefore, intellectual impairment may be a confounding variable as the females who demonstrated these behaviours in these studies may have done so due to their intellectual impairment as opposed to ASD (Van Wijngaarder-Cremers et al., 2014).

The authors conclude that while their findings show no differences in social and communication skills, and more repetitive and stereotyped behaviour in males, future research is needed to determine if intellectual impairment is a confounding factor and whether females with average or high IQ are being overlooked in studies (Van Wijngaarder-Cremers et al., 2014).

Hiller et al., (2014)

In order to rule out intellectual impairment as a confounding factor, Hiller et al. (2014) examined the diagnostic reports of 69 girls and 69 boys diagnosed with high-functioning ASD. None of the children had intellectual impairment. The mean age of the children and adolescents included in the study was 8 years.

At the time of this study, the fifth edition of the diagnostic and statistical manual (DSM-5) had just been released. Because this was a time of transition between the fourth edition (DSM-IV-TR) and the fifth, the diagnosing clinicians of 81% of the children reported their results according to both DSM editions. This enabled Hiller and her colleagues to present findings from both sets of DSM criteria, and also examine the impact of the DSM-5 criteria on the diagnosis of girls (Hiller et al., 2014).

Within each of the broad diagnostic criterion in the DSM there is a range of behaviours that a clinician can use to determine if a child meets a criterion. For example, under the “Deficits in social-emotional reciprocity” criterion on the DSM-5, there are several behaviours that may be considered:

- Abnormal social approach
- Failure of reciprocal conversation
- Reduced sharing of interests
- Reduced emotion and affect
- Failure to initiate or respond to social interaction

Previous studies have not found gender differences in the broad criteria. This is not surprising though because children in these studies all had diagnoses of ASD, which means they met all of these criteria. However, Hiller et al. took their analysis of gender differences a bit further, and looked at the behaviours listed within each criteria. They wanted to know if boys and girls showed differences in these individual behaviours.

Each behaviour was coded as either “no impairment”, “partially or somewhat impaired”, or “impaired”. Then these behaviours were analyzed to determine the likelihood that they predicted whether the child was a girl or a boy. Also, each broad criteria was coded as either “Yes” (meeting the criterion), “Somewhat” (partially meeting the criterion), or

“No” (not meeting the criterion).

For more information about DSM-IV-TR or DSM-5 criterion, please visit these websites:

DSM-IV: https://www.autism.com/tools_dsm4

DSM-5: <https://www.cdc.gov/ncbddd/autism/hcp-dsm.html>

Besides the DSM information, Hiller et al. also collected information about the children’s experiences at school, as there is some evidence to indicate that girls’ social and emotional symptoms are masked in a school environment (Hiller et al., 2014). The children’s parents completed questionnaires about any concerns expressed to them when their child was in preschool, and their current classroom teachers completed questionnaires about the children’s social functioning, externalizing behaviours (e.g. being disruptive in class, ‘meltdowns’, etc.), friendships, restricted interests, and atypical movements.

Hiller and her colleagues found the following:

► Social Criteria

- there were no significant differences overall when looking at the broad social criteria for both the DSM-IV-TR and DSM-5 – this was not surprising and was consistent with findings from other studies

But the authors’ findings related to specific behaviours were more revealing:

- **girls were better able to share interests, engage in reciprocal conversations, and use nonverbal gestures** – if a child did not have impaired ability to share interests, that child was almost four times more likely to be a girl. If a child had some ability to engage in conversation, then that child was almost three times more likely to be a girl. And over one third of the girls had no impairment in their ability to integrate nonverbal and verbal communicative behaviours.
- **girls presented with better imaginative play** – 75% of girls fell into the “no impairment” or “somewhat impaired” categories of imaginative play
- **both boys and girls had difficulties with friendships, but their problems manifested differently** – girls were often able to initiate friendships but had difficulty maintaining them, whereas boys had difficulty with both initiating and maintaining friendships. Girls’ difficulty maintaining friendships was usually related to their need to control the play. Hiller et al. explain that because boys present with more significant problems with friendships, this might make their impairment more salient and easier to detect.
- **girls were more likely to show some ability to regulate their behaviour in different situations** – this includes monitoring their voice and avoiding inappropriate comments or externalizing behaviours
- **girls’ social behaviours were more likely to be coded as “somewhat impaired” than boys** – this means that these behaviours were not as overt or impaired as would be expected for a typical ASD presentation. Less experienced clinicians may not see these ambiguous behaviours as signs of ASD, and this could contribute to under-identification.

- **despite girls' better use of nonverbal communication, boys and girls demonstrated equal social understanding impairment** – social understanding involves the ability to interpret and understand nonverbal behaviours. So girls' use of nonverbal social gestures does not reflect their underlying understanding (Hiller et al., 2014)

► Restricted, repetitive behaviour criteria

- **fewer girls presented with restricted interests and lining up or sorting behaviours** – Hiller et al. feel that this may contribute to making ASD more difficult to identify in girls
- **boys and girls presented with different types of fixations** – boys often had fixated interests with video games, iPads or television, while girls had fixated interests around random objects like animals, rocks, shells, or books. Hiller et al. explain that girls' more random obsessions may make them more unlikely to appear as the type of fixations that are associated with ASD. Furthermore, girls' preoccupation with objects may interfere less with daily life than boys' fixation on gaming or screens, and therefore girls' fixations may be reported less often by parents.
- **younger boys' restricted interests often revolved around wheeled toys, and older boys' (>7 years) interests revolved around screens (gaming, TV, etc.)**
- **both younger and older girls' interests were seemingly random**

► DSM-IV-TR versus DSM-5

Many of the children had data available from both the DSM-IV-TR and DSM-5 as part of their diagnostic assessment reports. Some of the children failed to meet criteria on the DSM-5 despite meeting criteria on the DSM-IV-TR. The authors analyzed whether the different behavioural presentation of girls would impact their ability to meet criteria on the DSM-5, but they found no significant difference in the percentage of boys and girls who failed to meet DSM-5 criteria. All of the children who failed to meet DSM-5 criteria did so because they failed to meet at least one of the three social domain criteria. Most of the children who failed to meet DSM-5 criteria had an original diagnosis of PDD-NOS.

► How girls and boys present at school

Parent report on the preschool years and school report about current functioning revealed the following:

- **More concerns were expressed about boys than girls in the preschool years, especially with regards to externalizing behaviours**
- **Current teachers reported more concerns about boys, especially with regards to externalizing behaviours and social skills** – Hiller et al. explain that because boys tend to be more disruptive in the classroom, their impairments may be more salient to teachers than girls' impairments
- **While some of the gender differences reported by teachers were also reflected in the diagnostic reports, the magnitude of the difference was far greater in the teachers' reporting** – for example, teachers reported no concerns about conversation skills for 50% of the girls, but only 17% of girls were rated as having typical conversation skills on their diagnostic reports

Towards a better understanding of girls with ASD

It seems that the developmental pediatrician I worked with years ago was right...girls with ASD really are tricky! And why are they tricky? Well, currently we see ASD through a “male-centric” lense (Hiller et al., 2014, p. 1393). The symptoms we have come to associate with the typical presentation of ASD have been defined by years of research on boys and a smaller number of girls who have confounding intellectual impairment.

There are several reasons why ASD may be difficult to detect in girls:

- Their behaviour at school may seem less impaired or concerning than that of boys
- They may show fewer and random restricted, repetitive behaviours
- They may be better able to regulate their behaviour and adjust to a variety of settings
- Their imaginative play may be better than boys’
- They may seek out friendships, even though they have trouble maintaining them
- They may have some ability to engage in conversation, share their interests, and use gestures

Furthermore, girls’ behaviours were more likely to be considered “somewhat impaired” than boys’ behaviours. This may give the appearance that a girl is functioning better than she really is, and can also make identification more difficult.

The take-home message from this line of research is that we need to be very diligent when it comes to girls with social communication difficulties. Often we are the first professionals that encounter a child, and the first ones to steer a family in the right direction towards a developmental assessment. While researchers continue to gather information about how ASD manifests in girls, we can use some of the above information to ensure we thoroughly assess the social communication abilities of the girls on our caseloads.

References

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Van Wijngaarden-Cremers, P. J. M., van Eeten, E., Groen, W. B., Van Deurzen, P. A., Oosterling, I. J. & Van der Gaag, R. J. (2014). Gender and age differences in the core triad of impairments in autism spectrum disorders: A systematic review and meta-analysis. *Journal of autism and developmental disorders*, 44, 627-635.

About The Hanen Centre

Founded in 1975, The Hanen Centre is a Canadian not-for-profit charitable organization with a global reach. Its mission is to provide parents, caregivers, early childhood educators and speech-language pathologists with the knowledge and training they need to help young children develop the best possible language, social and literacy skills. This includes children who have or are at risk for language delays, those with developmental challenges such as autism, and those who are developing typically.

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