Females with autism spectrum disorder (ASD) remain a mysterious group to many researchers in the autism community. What we know about the presentation of ASD, we have learned primarily from male-dominated samples. Thus, it is difficult to generalize our understanding of an ASD presentation to females. Currently, 1 in 59 people are diagnosed with ASD, and yet males are diagnosed, on average, four times more than are females (Baio et al., 2016). The literature suggests that females have a unique phenotypical presentation of ASD. As such, it is imperative that we look beyond just the diagnostic criteria for ASD to understand the female profile.

Thus far, the most consistently reported finding on the difference between males and females with ASD is that females have lower IQ scores (i.e., <70) than males (Giarelli et al., 2010). However, lower IQ scores from females with ASD may be due to diagnostic bias rather than the notion that ASD is more likely to occur in females with lower IQ scores than those with average or above average IQ scores. Research on IQ and ASD has looked at discrepancies in verbal and nonverbal IQ ability, finding some evidence for better ability in nonverbal/performance IQ compared to verbal IQ (Charman et al., 2011).

Because IQ scores alone do not encapsulate a cognitive profile, researchers have also begun to look at executive functions and ASD. People with ASD show greater executive functioning deficits compared to their non-ASD peers (Hughes, Plumet, & Leboyer, 1999). Preliminary findings on sex differences in executive functioning and ASD are mixed. Some indicate that females with ASD have greater executive functioning deficits than males with ASD (Lemon, Gargaro, Enticott, & Rinehart, 2011), while others refute that claim (Bolte, Duketis, Poustka, & Holtmann, 2011). These mixed findings warrant further exploration on the topic of sex differences and executive functioning in ASD.

The primary objective of the present study was to examine the cognitive performance and executive functioning of females with ASD, compared to males with ASD and females without ASD. The current study hypothesized that females with ASD would have similar Full-Scale IQ scores to their male ASD counterparts, but have higher Verbal IQ scores than them. Compared to females with ASD, females without ASD were hypothesized to experience greater differences in their Verbal IQ and Nonverbal IQ scores. For executive functioning, it was hypothesized that females would have fewer executive functioning deficits than males with ASD and greater deficits than females without ASD.

The data for this study were taken from comprehensive autism spectrum disorder evaluations performed by licensed clinical psychologists between 2011 and 2018. Children and adults were referred for evaluation for either an initial diagnosis or rule-out for autism spectrum disorder or for an evaluation of an established autism diagnosis. Participants were recruited for evaluation through hard- and electronic-copy flyers disseminated to community mental health centers, schools, and pediatric practices throughout the Capital Region. From these comprehensive evaluations, the present study used the following assessment tools:

- Autism Diagnostic Observation Schedule, Second Edition (ADOS-2; Lord et al., 2012) to evaluate the presence and severity of ASD symptoms
- Stanford-Binet Intelligence Scales, Fifth Edition (SB5; Roid, 2003) to measure cognitive performance
- Behavior Rating Inventory of Executive Function (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2000) to examine executive functioning

Participants included 54 children and adults between the ages of 5 and 18 (M = 9.72, SD = 4.02). Of the 54, 25 participants were female. Ten of the 25 female participants were diagnosed with ASD. Because the sample is clinical in nature, some participants with ASD were additionally diagnosed with a co-occurring disorder and most non-ASD female participants were diagnosed with another disorder.

To understand the cognitive profile of females with autism, females diagnosed with ASD were compared to ASD males and non-ASD females. Groups were separated by gender and ASD diagnosis: male ASD, female ASD, and female non-ASD. Scores from the SB5 on Full-Scale IQ (FSIQ), Nonverbal IQ (NVIQ), and Verbal IQ (VIQ) were compared across groups. Additionally, scores on the BRIEF Behavior Index, Metacognition Index, and Global Executive Composite were compared across groups. In order to analyze group differences, a series of Mann-Whitney U tests (Mann & Whitney, 1947) were performed.

The study’s results suggest that females with ASD experience significantly more executive functioning deficits, specifically regarding metacognition and global executive functioning, than both males with ASD and females without ASD. The results from IQ scores are inconsistent with prior research that suggests that females with ASD have lower IQ scores than males with ASD.

The sample is clinical in nature, which may explain the differences in this study’s findings compared to previous studies that have also examined females with autism, but used a normative sample for comparison. However, the clinical nature of the sample can also be viewed as a strength. By comparing individuals with autism spectrum disorder to those with suspected autism (and in need of an evaluation to rule it out), this study parses out distinct characteristics of autism in order to aid in better diagnostic information for females with a challenging presentation. This study provides new information on females with autism spectrum disorder, a group that has been largely overlooked in the literature. Future research should continue to examine the female presentation of autism.