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GIRLS WITH AUTISM: COMPARATIVE DIFFERENCES IN GENDER,
DIAGNOSIS, AND SOCIAL CAMOUFLAGING
A MASTER'S THESIS

SUBMITTED TO THE FACULTY
OF BETHEL UNIVERSITY

BY SARAH NEVIN
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GIRLS WITH AUTISM: COMPARATIVE DIFFERENCES IN GENDER,
DIAGNOSIS, AND SOCIAL CAMOUFLAGING
A MASTER'S THESIS

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APPROVED

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Thank you to my husband and children for the unwavering support and encouragement while I completed this program. I could not have done this without you. Shawn - I love you. To my parents and sisters; thank you for encouraging me to follow my dreams of being a special education teacher. To my Aunt Cindy. So many changes have been made to our world and today children now have the rights you were never granted. We love you and miss you every day. We know we will meet again in Heaven.

Abstract

Autism diagnostic differences exist based on gender with a current diagnostic ratio of males to females at 4:1. Beyond diagnosis, differences persist between genders. Research indicates that females with autism display social, communication, and coping skills differently. Camouflaging is more widely used by autistic females to fit in socially, hide autistic symptoms, or to be more like their neurotypical peers. Research suggests camouflaging may have long-term mental health implications. When educators are informed of gender differences and implications, supports can be implemented for female students with autism. Support should include teacher education about autism and camouflaging, which can help identify females with autism and provide strategies that better support mental health concerns.

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Chapter 1: Introduction

Do you remember what it was like to walk into a classroom and search the room for someone you knew? The fear of the unfamiliar takes over while searching for a friendly face to recognize and hopefully sit by. Imagine what this is like for children with autism spectrum disorders; children who have a deficit in the areas of social communication and interaction with others. How do these children with significant needs in social interaction and communication socially fit in with same-aged peers? What is the difference between the genders in regards to these social interactions?

The most recent Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5; American Psychiatric Association, 2013) states that to meet diagnostic criteria for autism spectrum disorders (ASD) a child must have persistent deficits in each of three areas of social communication and interaction plus at least two of four types of restricted, repetitive behaviors. Males are more commonly diagnosed with autism than females. The male-females ratio for diagnosis is quoted as 4:1. Currently in the United States the Centers for Disease Control (CDC) and the Developmental Disabilities Monitoring (ADDM) Network stated that the ASD rates are about 1 in 54 children who have been identified with autism spectrum disorder (ASD) according to estimates. In the state of Minnesota boys were 3.9 times more likely to be identified with ASD than girls, with 1 in 44 children being diagnosed with autism (MN-ADDM, 2016). At my current school, data shows that only 25% of the student population across 4 campuses is female.

As I read these statistics, I wonder what makes this difference between males and females. Is it due to the male/ female chromosomes? Or is it due to the way females and males exhibit themselves socially and how they communicate with others?

Autism Diagnosis & Special Education

The Individuals with Disabilities Act (IDEA) (2004) defines autism as a “developmental disability that affects verbal and nonverbal communication and social interaction, usually before the age of three, that will also adversely affect a child’s educational performance” (2004). There is no mention or discussion about differences between females and males. Duvekot, van der Ende, Verhulst, Slappendel, van Daalen, Maras, & Greaves-Lord (2017) discussed that the current diagnostic measures were written from samples focused predominantly on males (pg. 647). They suggested that this bias may inhibit an earlier diagnosis for females who show stronger abilities in social-communication, but have more internalizing factors, such as camouflaging and mental health concerns (pg. 647).

Social Challenges, Camouflaging, & Mental Health

Hull, Petrides, & Mandy (2019) described an approach to social situations related to the female phenotype known as “camouflaging”, which is a strategy to appear less autistic in social situations. Many women describe the reasons behind this as a way to “hide” their condition or to blend in with others in social situations. Other reasons may be to disguise their true selves, find a way to develop relationships, or find a way to not appear “different”.

American actress Daryl Hannah has spoken out about her autism diagnosis at age 5. She stated in many interviews that doctors wanted to institutionalize her, which her mother refused. Hannah has stated she felt isolated and shy by her condition, feeling different and that she checked out at school and that she would come home to rock incessantly. This has carried out into her career; in that she does not grant many interviews and rarely attends her own movie premiers due to her anxiety and finding this a way to manage her condition. Other women in the spotlight, such as Susan Boyle, a Scottish singer made famous by Britain’s Got Talent, did not

receive a diagnosis until she was an adult. She was misdiagnosed with “brain damage” due to complications from birth. During her childhood she was taunted by peers as being “Susie Simple” while in school. Boyle has said in interviews this has led to depression and mood swings throughout her life. While she has built her own home, she has moved back into her childhood home after the death of her mother, where she feels more comfortable.

While these two women are adults with autism, with one diagnosed as a child and the other as an adult, it is relevant to this research to also include adolescents that have been diagnosed with autism. One such person is that of Greta Thunberg, a Swedish teen who is well known for her “Skolstrejk för klimatet” (school strike for climate). She has been diagnosed as having autism spectrum disorder and obsessive-compulsive disorder (OCD). Thunberg did not immediately share her diagnosis, as she did not want people to see it as an illness or something negative about her. Thunberg describes her diagnosis as something influential, stating in tweets that “I have Asperger’s and that means I’m sometimes a bit different from the norm. And given the right circumstances, being different is a superpower.” Her beliefs have led to movements; not only on climate change but also for those with and supporting those on the autism spectrum.

Even in my own life, I have had the opportunities to meet with women who were diagnosed later in life with autism. Before I became a teacher, I worked in a corporate office with a woman who would later share a late in life diagnosis. “Christine” was a woman in her 30’s who lived alone, with her only social outlets being work and church. I remember her struggling to date, joining groups for singles who would travel or do weekend activities together. She struggled to make connections with not only those of the opposite sex, but also within social groups at work. She was single for most of the time we worked together. Lunch breaks could suddenly turn awkward when Christine would interrupt and attempt to change the subject to a

topic that she was interested in that was completely unrelated to the current lunchroom conversation. Meetings could become tumultuous if duties and agendas were not followed as planned. This caused some coworkers to avoid or ignore Christine over the years we worked together. Eventually Christine met a man on a Christian dating website and moved away. Our only contact was through social media, where eventually I saw a post by her stating she was diagnosed with autism. I was already working as a special education teacher, with an ASD license at this point. I recall feeling as so many pieces of what I knew about her had fallen into place.

Christine would not be alone in a later in life diagnosis. Leedham, Thompson, Smith & Freeth (2020) completed eleven interviews with women who were diagnosed with autism later in life. The participants shared their experiences, pre- and post-diagnosis. A main theme was that their autism was a “hidden” condition. One woman stated:

I never felt like I fitted in anywhere ... other people just seemed so - like their lives have always seemed much easier ... they’ve just seemed to do things without the whole thought process that I have to go through (pg. 138).

Other women described that the decision to camouflage themselves in social situations was unconscious or less deliberate. Some recognized the need for acceptance and understood the “persona” they took in order to fit in:

... it started at school and it went on to college as well. I wore different clothes to everything that I wore at home I hated this person that I put on (pg. 138).

Leedham et al., (2020) participants described camouflaging as a way to “survive”, which in turn led some to demonstrate mental health concerns. Many stated they were unable to understand themselves and were not able to receive the mental health care they needed, due to misdiagnosis (pg. 139).

Tubío-Fungueiriño, Cruz, Sampaio, Carracedo, & Fernández-Prieto, M. (2020) also discussed the long-term effects of camouflaging. They found that long term effects of camouflaging can have consequences, such as self-esteem, high anxiety, and depression. (p. 7). Females over males were also more likely to have negative feelings after camouflaging. A participant in this study explained:

“[I feel] empty. Kind of sad about it, like that I can’t be open and honest without people treating me less. I don’t know how else to word it. It’s just, I don’t want to be treated like a lesser person.” (pg. 9).

There was a difference between autistic males and females in regards to camouflaging, with females feeling more negatively to the experiences over males. Reflecting on these situations discussed above has led me to questions that I want to explore: What are the differences and similarities between males and females with autism? Why is there such a discrepancy in diagnosis?

I chose this topic to research as I have spent the last five school years working in a school designed for students on the autism spectrum. As my school is designed to meet the individual abilities, skills, and needs of students with autism, I have developed the question stated above because every day I see the population of my school, in regards to males versus females. Walking through the halls, the number of male students is vastly higher than that of our female students. My class sizes usually range between 10-12 students per class, and I have never had more than 2 female students in each class. I have also noticed these same girls have varying levels of needs and abilities, and often have not demonstrated deficits in either social communication nor the repetitive and restricted behaviors that are associated in the same way males present with autism.

Based on this observation, I have designed the question for my thesis: What are the major differences and similarities between males and females, in regards to autism and why is there such a discrepancy in the diagnosis between the two?

CHAPTER II: LITERATURE REVIEW

To locate the literature for this thesis, searches of Academic Search Premier, EBSCO Megafire, ERIC, and Sage Journals were conducted for publications from 2009 to 2021. This list was narrowed by only reviewing published empirical studies articles from peer reviewed journals. The key words that were used in these searches were “autism,” “diagnosis,” and “girls,” and “camouflaging,” or “masking.” The structure of this chapter is to review the literature on autism in girls, through three sections in this order: Gender Differences in Autism; Camouflaging in Girls with Autism; and Mental Health Concerns Related to Camouflaging.

Gender Differences in Autism

Andesson, Gillberg, & Miniscalco (2012) set out to find potential differences with referrals to assessments for suspected ASD between girls and boys between the ages of one and three. Through this study, researchers aimed to describe any differences in the sample size of 1–3-year-old girls and compare them with same aged male peers with suspected ASD, analyze the results and compare them across genders, to consider additional research as a result of findings from this study (pg. 414).

This study was done through the AUDIE project (AUtism Detection and Intervention in Early Life), at the Child Neuropsychiatry Clinic (CNC) in collaboration with Child Health Care Services and Autism Habilitation Centres in Gothenburg. The aim of the AUDIE project was to (a) identify 1–3-year-old children with symptoms of ASD and other developmental disorders. Forty children (20 boys and 20 girls), under the age of 4 (mean age 37, range 21–45 months) were chosen for this study. They were recruited by the CNC after being referred for assessment and diagnosed with ASD (pg. 414). The clinical evaluation diagnosed nine girls with autism, while another nine were identified with PDD-NOS, one with Asperger’s, and one with autistic

traits. The Autistic disorder was diagnosed for 11 boys, six had atypical autism, and one with Asperger syndrome, and two boys had marked autistic traits (pg. 417).

Various assessments were given to the children, including: medical-neurological-psychiatric examination; (b) child and family medical/psychiatric history taken from parent; (c) Griffiths' Developmental Scales, and when applicable, according to developmental age of the child, the Wechsler Preschool and Primary Scale of Intelligence, third edition (WPPSI-III), (d) Vineland Adaptive Behavior Scales (VABS), (e) MacArthur Communicative Development Inventory, (f) Reynell Developmental Language Scales III (RDLS), (g) Diagnostic Interview for Social and Communication disorders (DISCO-11), (h) preschool observation (if the child did not attend a pre-school, an observation was made of the child in the home), (i) Autism Diagnostic Observation Schedule (ADOS), and (j) Children's Global Assessment Scale (CGAS). Evaluations using each assessment were completed by the researchers (pg. 415).

The results of the assessments showed that 13 (7/20 girls; 6/20 boys) did not meet ASD algorithm criteria according to the ADOS. Expressive language was an issue for the majority of children 19/40 (8/20 girls, 11/20 boys) lacked speech altogether or used only a few single words or communicative sentences. Nine children (6/20 girls, 3/20 boys) demonstrated echolalia and 12/40 (6/20 girls, 6/20 boys) demonstrated a need for functional communication. Receptive language was also a concern for most of the children, who demonstrated a clinical one impairment with CGAS scores that ranged from 10 to 75 (girls; 10–59, boys; 10–75). One participant with the highest CGAS score (75) had autistic traits and was considered borderline for atypical autism. When reviewing the data from all assessments, the authors discovered significant gender differences on any of the variables tested (clinical diagnosis, cognitive level)

reciprocity and RRB, adaptive behavior, comprehension, expressive language, ADOS-R severity score or overall global functioning (pg. 417).

There was no significant difference in the sample regarding developmental profiles, nor was there a significant difference in RRB between boys and girls in this study. Findings indicated that girls in this study may have better communication skills than boys with statistically significant differences. The study results interpreted that there was no detectable difference between ASD girls and boys when younger than 4 years old (pg. 420).

A strength of this study included samples matched for age and diagnosis. However, the limitations included a relatively small sample size (pg. 420).

Milner, McIntosh, Colvert & Happe (2019) examined five themes related to females on the autism spectrum, specifically: obstacles to fitting in, both the positive and negative aspects of ASD, and the understanding of the perspectives of others (p. 2389).

The researchers questioned the underdiagnosis of autism in females, due to male-only research which led to bias, and the behavioral differences between males and females, specifically in the areas of reciprocal conversations, friendships, special interests, and camouflaging. They considered that these factors may have played a part in why females receive diagnoses and support less frequently than their male counterparts (p. 2389-2390).

The qualitative study included conversations with 18 females and four mothers of children on the autism spectrum on the topics of diagnosis, impact, and coping (p. 2389). The participants were either clinically ($n = 16$) or self-diagnosed ($n = 2$). Both a clinical diagnosis and self-diagnosis were included in the sample to be inclusive and to acknowledge that misdiagnosis and undiagnosed women exist. The groups' ages were between 11-55. Inclusion

criteria stated that the participants must be female, or a parent of a female with an autism diagnosis, and that the participant must currently live in the United Kingdom (p. 2390-2391).

The study included a topic guide for discussions with 15 questions for the female autism group and 16 questions for the parent group. The topics covered the autism diagnostic pathway, impact of autism, resilience, and imitating. The researchers designed the questions based on previous research, writings by women on the spectrum, and their own hypothesis (p. 2391).

The participants were gathered via social media, word of mouth, contacts from secondary schools, and referrals from a clinic specializing in autism. Group discussions were held at a research center, through in-home, or telephone discussions. The researchers allowed for both groups and/or individuals, which accommodated for individual preferences (p. 2391).

The data analysis indicated that many of the women and girls in the study reported adopting strategies to mask and camouflage their autism and behaviors. They also reported that the participants discussed the appropriate length of time they needed to maintain eye contact (2399).

Discussions supported evidence that females with autism struggled to initiate and maintain relationships. The participants discussed wanting friendships, yet shared they often felt lonely (p. 2399). Mothers in the study reported that they lacked clinical awareness of female autism, along with lack of a diagnostic referral. This linked the participants' masking behaviors to a delayed diagnosis (p. 2399).

The researchers noted that the relatively small sample of participants ($n = 22$) may have limited their findings and the ability to include race, ethnicity, socio-economic status, which did not accurately represent all females with autism (p. 2400).

The study allowed participants to self-diagnose. Voluntary recruitment led the researchers to question whether those who participated may have been better at coping or masking than individuals on the spectrum with lower cognitive or minimal language disabilities (p. 2401).

The researchers also noted that due to the small sample size, the discussion group sizes had an equal number of researchers and participants, which may have led to a dynamic that influenced the responses (p. 2401).

A strength of this study was that participants shared their thoughts and feelings related to five distinct themes of autism. Qualitative data reflected the unique female experiences of individuals on the autism spectrum.

The unique female experience with autism, can be examined against further known differences that exist between genders. Knutsen, Crossman, Perrin, Shui, & Kuhlthau (2018) examined the sex differences in clinically identified individuals on the autism spectrum disorder regarding restricted and repetitive behaviors (RRB) and interests (p. 858). Researchers hypothesized that there would be fewer restrictive and repetitive behaviors in females versus males, along with differences between the age groups.

Participants were chosen from the Autism Treatment Network (ATN) registry. The registry is the first of its kind and one of the largest autism data entries in North America. Over 7,000 children are enrolled in this registry. It was designed as a multi-center observational study, collecting data on children with ASD from ages 2-17 years. Those enrolled met the Diagnostic and Statistical Manual of Mental Disorders, 4th and 5th edition (DSM-IV and DSM-V), criteria for autism spectrum disorders (ASD) based on results of the Autism Diagnostic Observation Schedule Second Edition (ADOS-2) (p. 860).

The researchers found 1024 children with ASD (512 female and 512 male) with an age range of 2-12 years (p. 861). Females were matched with selected males on the same inclusion criteria (p. 86). The Autism Diagnostic Observation Schedule Second Edition (ADOS-2), a clinician-based assessment of communication, social interaction, play, and restricted, repetitive behaviors, interests and activities were administered (p. 860).

Researchers also gathered the composite IQ scores from two standardized IQ instruments; the Stanford-Binet, Fifth Edition and the Mullen Scales of Early Learning. A small group of participants were administered other standardized IQ assessments, namely: Differential Ability Scales, Second Edition (DAS-II); Wechsler Intelligence Scales (Third, Fourth, and Preschool Eds); and Bayley Scales of Infant Development (p. 860-861).

The study was driven by quantitative data collected from assessments designed for ASD diagnosis, along with data driven from overall composite IQ scores to help determine the participants' intelligence.

The study results noted more similarities than differences in the areas of restrictive and repetitive behaviors (RRB) among females and males. There were no differences based on sex on the ADOS-2 RRB domain across the full sample. However, a key finding was a decreased level of repetitive interest/stereotyped behaviors in younger higher functioning females and in older lower functioning females, when compared to similar males (p. 863).

A main strength of this study was the large number of participants. By using a large number of participants, the authors provided the largest examination to date of RRB and set out to find if any differences existed based on sex (p. 865).

The authors stated that their study added information to the ASD phenotype, the similarities and differences in RRB based on age and cognitive functioning in regards to children

with ASD, and that this was the largest examination to date on RRB. The findings suggested that females and males exhibit many similarities and differences on clinically based assessments. Researchers found a pattern in preschool high functioning females and elementary aged lower-functioning females who demonstrated decreased rates of repetitive interests/stereotypical behaviors when compared to similar males (p. 865).

Lundström, Mårland, Kuja-Halkola, Anckarsäter, Lichtenstein, Gillberg, & Nilsson (2019) compared the degree of autism symptomatology in boys and girls with a registered diagnosis of ASD along with additional coexisting disorders, by using a sex-specific standardized score (p. 1-2). The authors further compared data from males and females with a registered diagnosis of ASD with respect to raw and standardized Autism-Tics, ADHD and other Comorbidities (A-TAC) domain scores for autism spectrum disorders (ASD), attention-deficit/hyperactivity disorder (ADHD), learning disabilities (LD) and other health disorders (ODD) (p. 3).

Specific diagnostic tools used to diagnose ASD were based and developed using primarily male samples. Lundstrom et al. (2019) described that girls may be overlooked as their socio-communicative difficulties may be more subtle than what is exhibited by males (p. 1).

This study described how the original trials referenced in the Diagnostic and Statistical Manual of Mental Disorders, Fourth edition (DSM-IV), along with studies used to develop clinical instruments, such as the Autism Diagnostic Interview (ADI), Autism Diagnostic Observation Schedule (ADOS), and the Diagnostic Interview for Social and Communication Disorders (DISC) included substantially more male than female participants (p. 3). The authors hypothesized that girls with autism may present at the higher end of the autism spectrum versus boys when compared to neurotypical children (p. 2).

Study participants were selected in Sweden's National Patient Register (NPR), which assigns all citizens a number at birth, or upon citizenship. The register also is connected to the Child and Adolescent Twin Study in Sweden (CATSS). The CATSS is a study for twins born between July 1992 and February of 2007. The CATSS included inventories that identified children on the autism spectrum. The authors identified 308 boys and 122 girls diagnosed with ASD, from the 30,392 individuals in the CATSS (p. 2).

For this study, families completed a phone interview before the twin's 9th birthday and inventories were distributed to parents who responded. The test included the Autism - Tics, ADHD and other Comorbidities inventory (A-TAC), a phone interview with 96 questions regarding child and adolescent psychiatric problems. Of the 96 questions, 17 fall under the ASD domain, 19 Attention-Deficit/Hyperactivity Disorder (ADHD), 3 Learning Disabilities (LD), and 5 Oppositional Defiant Disorder (ODD) (p. 2).

The raw mean scores for individuals diagnosed with ASD and ADHD, were higher for boys when compared to girls. However, this was not the case with the raw scores for LD or ODD. The opposite occurred when looking at the standardized scores. Specifically, the females diagnosed with ASD scores 3.23 standard deviations above the female mean, while the boys scored 2.75 23 standard deviations above the male mean. The researchers explained that the girls with an ASD diagnosis deviated an additional 0.48 sex-specific standard deviations further from the girl mean than boys did from the boy mean (p. 3).

Strengths found in this study included the large sampling of data that identified 308 boys and 122 girls with a registered diagnosis of ASD. This sampling gave a registered prevalence of 1.4% and a male-female ratio of 2.5:1 (p. 2). Other strengths included a high response rate and the use of a clinical diagnosis (p. 3).

Cridland, Jones, Caputi, & Magee (2013) set out to investigate the experiences of adolescent girls on the autism spectrum (p. 1261) and questioned how adolescent girls on the autism spectrum differed from their male counterparts, specifically in the areas of diagnosis and relationships (p. 1262). The authors hypothesized that by interviewing adolescent girls with ASD and their mothers, a multifaceted understanding of their experiences would be gained (p. 1262).

The participants in this study included three mother-daughter groups, along with two additional mothers. The daughters of the latter were not interviewed, as one child did not know she had a diagnosis of ASD and another parent did not grant permission. All participants were female and in the age range of 12-17 years. The diagnosis was based on the Diagnostic and Statistical Manual of Mental Disorders (4th ed.; (DSM-IV). The participants' information also included annual household income (\$20,000 to \$200,000, with a mean of \$84,000). All participants and their mothers were born in Australia and were recruited through local school and community groups, who shared contact information with the researchers (p. 1263).

This qualitative study was completed via interview and discussions. Data was collected from the use of interviews and discussions in the participants' home (p. 1264). Interviews lasted around 60 minutes and were recorded for transcription. Each interview began with an open-ended statement 'What have been your experiences of being an adolescent girl/ /having an adolescent daughter with ASD?', which the authors described as a way to allow participants to lead the discussion (p. 1264).

Participants explored their own views and interpretations of issues, versus objective accounts (p. 1262). The authors explained that the credibility of the data was facilitated this way

because the analysis of interview material could have been influenced by the bias of the researchers, or their experience with adolescents and families with ASD (p. 1264).

Seven key themes were found by the research team in data analysis: diagnostic issues, being surrounded by boys, high school experiences, complexity of adolescent female relationships, puberty and related issues, sexual relationships and concerns, impact of having a daughter with ASD (p. 1264 – 1269).

Within those themes, the authors discovered that some issues were similar to boys with ASD, specifically: negative implications of late diagnosis, challenges of transitioning to and coping with high school, ‘hands-on’ role of parents into adolescence, difficulties adjusting to the increased demands of adolescent hygiene routines, and the importance of learning personal boundaries in interactions with others (p. 1272). From the perspective of girls with ASD, researchers found unique issues, such as: difficulties developing and maintaining friendships with neurotypically developing peers (NTD); implications of having a condition with a skewed sex differentiation; sex-specific puberty issues; and sexual vulnerability (p. 1270).

Cridland et al. (2013) stated experiences shared by girls and their families may be useful for health practitioners, clinicians, teachers, and other families with ASD. The data could help support and understand adolescent differences in girls with ASD (p. 1272).

Head, McGillivray, & Stokes (2014) investigated the gender differences between males and females with autism spectrum disorders (ASD), specifically in the areas of emotions and social skills (p. 1). They sought to discover what social and emotional advantages existed in neurotypical females compared to neurotypical males, and whether these differences would be significant between males and females with a clinical diagnosis of autism (p. 3). The authors

hypothesized that females with ASD would display better social skills than males with ASD on a test of friendship and social functioning (p. 1).

This study was conducted with a total of 101 participants; 50 of these were adolescents with ASD (males, $n = 25$ and females, $n = 25$). The remaining participants were neurotypical males ($n = 26$) and females ($n = 25$). The ages ranged from 10 to 16 years (mean 12.87). There were no noted differences between ages and genders.

Participants were selected from different ASD support groups and databases. All participants with ASD were required to have a formal diagnosis from a psychologist, pediatrician, or a child psychiatrist. They were also required to have been identified as high functioning, with an IQ score above 70 points (p. 4). All subjects completed two questionnaires: the Friendship Questionnaire (FQ) and a Demographics Questionnaire (DQ) (p. 4).

The Friendship Questionnaire developed by Baron-Choen and Wheelwright measured friendship quality, understanding and empathy. This questionnaire was originally designed for British adults but was revised down to a 20-minute structured researcher-subject interview (p. 4)

The 10-item Demographic Questionnaire (DQ) was completed by the participants' parents in about 30 minutes. The DQ collected data about the child, including age, gender, IQ, ASD diagnosis and any other comorbid diagnosis. This questionnaire also gathered information about other family members with a diagnosis of ASD (p. 4).

Based on the results of the FQ, females with ASD demonstrated better social skills than males with ASD. The results indicated that females with ASD had better social skills than their male ASD counterparts. However, both female and male participants with ASD demonstrated less developed social skills than their neurotypical peers. An interesting finding was that neurotypical males and females with ASD showed similar results on the FQ. Parents of children

with ASD gave lower scores than their children, with the biggest difference being between females with ASD and their parents. The overall findings demonstrated a need for social interventions designed specifically for females with ASD, as their social needs were significantly different than males with ASD (p. 8).

A limitation of the study was that while all participants had an ASD diagnosis, the researchers did not confirm the diagnosis by using the Autism Diagnostic Observation Schedule (ADOS) or Autism Diagnostic Interview Revised (ADI-R). The authors discussed that the diagnoses could have been made in error, as it was not confirmed by a diagnostic evaluation tool.

The FQ also contained specifically modified questions to fit this particular study, such as telephone use. Because the questions were not validated, the results may have been impacted (p. 8). A main strength from this study was that the findings suggested the need for better social interventions for females with ASD (p. 8).

The authors concluded that there was an overall demonstrated difference between females with ASD and their male counterparts based on the FQ. A surprising finding was that females with ASD and neurotypical males had similar FQ scores, which supported the idea that females with ASD may have a distinct ASD profile. This theory was supported by clinical reports that females with ASD had highly developed mimicry and imitation abilities, and better social skills than previously reported. The authors suggested further research into this, as to better develop gender-appropriate diagnostic criteria and gender-appropriate interventions for ASD (p. 8).

Dworzynski, Ronald, Bolton, & Happé (2012) explored the differences in autistic traits in relation to sex, diagnosis, and differential factors that impact how males and females met diagnostic criteria for autism. It was hypothesized that current diagnostic criteria and practices

were biased towards the male stereotype of ASD, which in turn caused girls to be under-diagnosed, unless specific and obvious symptoms were present. Three specific questions were asked based on the hypothesis: (1) Do girls have to show higher levels of ASD traits than boys in order to meet diagnostic criteria? (2) Does meeting diagnostic criteria for ASD have to do with intellectual levels in girls more than in boys? (3) Do ASD-diagnosed girls have more additional behavior problems than ASD-diagnosed boys, compared with their undiagnosed but high ASD-trait peers (pg. 789)?

The participants of this study were found from the TEDS, a United Kingdom-based population study of twins born in 1994 to 1996 who were then followed up after the age of 18 months. Consent was given for children who were screened for autistic traits after the age of 8 from the Childhood Autism Spectrum Test (CAST) from the portion that included parental report (pg. 789). Twins at risk were identified by the following factors: a twin or co-twin had a CAST score on or above the screening cut-off (15); parents identified autism or Asperger syndrome at any age in TEDS questionnaires from age 4 years up to and including the 9-year data collection, or parents informed TEDS that one or both of the twins had autism or Asperger syndrome (pg. 790). A total of 189 children between ages 10 and 12 met diagnostic criteria for ASD according to a parental interview on the Development and Well-Being Assessment (DAWBA) with 29 girls and 160 boys, yielding a male-to-female ratio of 5.5. In the high-CAST group, did not meet diagnostic criteria on DAWBA), the 174 children equaled 55 girls (32%) and 119 boys (68%), with a 2.2 sex ratio (pg. 792)

Measures used within the study included the quantitative Childhood Autism Spectrum Test19 (CAST), a screening instrument for autism spectrum conditions, completed by parents, and designed for nonclinical samples. All questionnaire items are answered “yes” or “no,” with

responses scored additively. A score above 14 was the cut-off for children at risk for ASD (pg. 791).

The second measurement focused on intellectual abilities and included data assessments taken at various time-points from ages 2, 3, and 4 throughout the TEDS program and included parent-administered measures, and later telephone and Internet-based assessments. Verbal ability was assessed with the MacArthur Communicative Development Inventories (MCDI: UKSF). This assessed grammar, vocabulary, and semantic/pragmatic ability. For nonverbal ability, the Parent Report of Children's Abilities (PARCA), was designed as an age-appropriate instrument (pg. 791).

Behavioral concerns were also considered and assessed using the teacher ratings on the Strengths and Difficulties Questionnaire (SDQ). This assessment assessed internalizing and externalizing difficulties, peer problems, hyperactivity, and pro-social traits (pg. 791).

Comparing the results of the 189 children chosen for this study, those with high levels of ASD traits, suggested that a low cognitive ability and/ or behavioral problems distinguished girls over the boys who met diagnostic criteria. This could support the theory that girls with ASD are easily missed in the diagnostic process, as only those with high levels of ASD traits but without additional intellectual or behavioral problems do not meet diagnostic criteria. It was suggested that the girls who do not meet criteria could be coping in another way (pg. 793-794).

A strength of the study indicated that future research should be explored as to whether females receive alternative diagnoses instead of ASD, due to either misdiagnosis or other comorbid disorders. Further studies could include concurrent mental health difficulties, stress, or self-reported strategies and suffering in girls versus boys with high levels of autistic-like traits (pg. 794).

A limitation of this study was this was one of the first studies completed on the differences between diagnosed and undiagnosed high-autism trait girls versus boys. Sample sizes were also very small, in comparison to the overall population. Data may also have been missing, as most data was parent-reported (pg. 794).

Whitlock, Fulton, Lai, Pellicano, & Mandy (2020) investigated the role of educators in the identification of girls with autism. Two hypotheses were created for this study: the first was that gender stereotypes influence educators' decision making, while the second was that the female phenotype would influence educators' decision-making (pg. 3).

The study set out to investigate whether more experienced educators with autism were more sensitive to symptoms of autism and if those with better training would with each participant answering questions based on the reading. These vignettes were fictional and described children with: (a) the male autism phenotype, (b) the female autism phenotype, (c) separation anxiety, and (d) attention-deficit/ hyperactivity disorder (ADHD). The latter two were included to avoid biases if the participants realized the study was on the identification of autism (pg. 3).

Researchers recruited 289 primary school educators through social media, with requirements that each (a) complete all items in the survey, and (b) had current or previous experience of working in an educational capacity within a UK primary school or had received (or are currently receiving) training to teach in a primary school. The requirements allowed for the inclusion of not only qualified primary school teachers, but also teachers in training and teaching assistants (pg. 3). Of the 289 respondents, 94.1% (n = 272) were female. Ages ranged from 20 to 64, and only 36 were not fully qualified teachers, which was nine trainee teachers, 16 teaching assistants, and 11 in "other" current or past educational roles in primary schools (pg. 6).

The vignettes were given in a random order to each of the participants, as was the gender for each vignette (“Jack” for boys and “Chloe” for girls). Each vignette was created with the assistance of experts, including an autistic adult, as well as clinicians, researchers, and educators. The aspect of the design included gender neutral information, which allowed for the name and gender pronouns to be interchangeable (pg. 4).

The measure for this study also included questions on teacher characteristics related to ratings on the autism vignettes. These were given after the participants rated all four vignettes and included rated scales on: personal experiences of autism, received specific autism training, and number of autistic children worked with as an educator (pg. 4-5).

When analyzing the data, primary educational staff were found more likely to identify autism in boys over girls and were more sensitive to the male phenotype, matching the earlier hypotheses. It was also noted that a bias occurred in girls showing the female phenotype, but not for girls with the male autism phenotype (pg. 10). This led the authors to support the belief that bias existed for girls with autism and led to the potential source of this bias, which was the decision making of educators. The authors suggested that this bias existed based solely on gender and could have been due to an expectancy bias among respondents that girls with autistic symptoms would be less likely to be autistic. This could be viewed as a stereotype that may have been an influence in the expectations of the educational respondents (pg. 11-12).

Partial support for the hypothesis was also found in the gender stereotyping effect that operated for the female phenotype, but not the male phenotype. The authors believed that educators would rate a male child as more likely to be autistic over a female child, even if both vignettes had similar characteristics. It was also noted that educational staff indicated that if the children in the vignettes with a female phenotype had been real, they would have unlikely

received support based on an assessment from a professional who could give a diagnosis (pg. 12).

Educators also expressed a less likelihood of seeking support for females compared to male children, and also for those expressing a female phenotype over a male. However, when a control was given within the vignettes on whether a child had autism, ADHD, anxiety, or another disability, the effects of the gender specific phenotype was no longer influential (pg. 12).

Educators were asked if they had any training in regards to recognizing autism. Research from this study suggested that this may have little effect on educators' ability to recognize autism, and that personal variables may have a better prediction of recognizing autism (pg. 12). The overall conclusion of the study was that both the female presentation of autism and the female gender does have an increased likelihood of autism unrecognized by primary school staff (pg. 13).

A limitation of this study was the use of fictional children, rather than real children. Another limitation was that only the educator estimations were used rather than real life behaviors. The authors suggested that they could not be sure of the validity of the study based on these two things. It was also noted that the views taken in this study were binary of gender, so the experiences of those with a gender different than what they were assigned at birth, or those who are non-binary are not included in this study. Future research could include gender diversity. Another limitation was that not all participants were qualified teachers, some were in training or were assistants. This led to the discrepancy of level of experiences in the field of autism for total respondents (pg. 12-13).

Duvekot, van der Ende, Verhulst, Slappendel, van Daalen, Maras, & Greaves-Lord (2016) examined whether or not certain behavioral characteristics determined the probability of

an autism spectrum diagnosis differently in girls versus boys. The hypothesis of this study was that girls with higher levels of emotional and behavioral problems and lower levels of cognitive functioning would have a higher probability of diagnosis, with the opposite being true of males. A secondary hypothesis was that restrictive and repetitive behaviors would be less predictive of an autism diagnosis in girls (pg. 647).

The first part of the study included an investigation into the differences of autism diagnosis between girls and boys. The second part of the study investigated whether overall autistic impairment, RRB symptoms, sensory symptoms, emotional and behavioral problems, and cognitive functioning differentially influenced an ASD diagnosis in girls versus boys (pg. 647).

Participants of this study were chosen from the Social Spectrum Study, a cohort from the Netherlands consisting of clinically referred children with ASD. The total sample screened was 1281 children (118 girls and 310 boys) were identified as at risk of ASD. The participants were further eliminated after diagnostic assessments were completed; these were the short version of the Developmental, Dimensional and Diagnostic Interview (3Di), the second edition of the Autism Diagnostic Observation Schedule (ADOS-2). The 3Di and ADOS assessments were used to determine the presence or absence of an ASD diagnosis. Several questionnaires were given at this time, including the Repetitive Behavior Scale–Revised (RBS-R) and the Short Sensory Profile (SSP). There were 348 children who did not participate in the diagnostic measures and were excluded and an additional 89 were excluded because only one diagnostic assessment was available. The final sample consisted of 64 girls and 167 boys aged 2–12 years at the time of diagnostic assessment. IQ scores were also included in the final sample, and these ranged from

50 to 145, with the majority of IQ scores falling in the normal range. Only 11% of the children showed evidence of an intellectual disability (pg. 648).

After written informed parental consent was given, questionnaires regarding characteristics of the child, parent, and family were completed. Further measures given included the (1) the SRS-2 School-Age Form (SRS-2), a 65-item questionnaire assessing social and behavioral difficulties associated with autism. Participants rate statements about behaviors over the last 6 months on a scale ranging from 1 (not true) to 4 (almost always true). Higher scores reflected greater severity of autistic symptoms; the Repetitive Behaviors Scale - Revised (RBS-R), a 43-item questionnaire used to assess a variety of restricted and repetitive behaviors (i.e., self-injurious behavior, stereotypic behavior, compulsive behavior, ritualistic behavior, insistence on sameness, and restricted interests) that are characteristics of individuals with ASD. The items were rated on a 4-point scale ranging from 0 (“behavior does not occur”) to 3 (“behavior occurs and is a serious problem”), with a total score including 38 of the original 43 items based on a factor analysis as an overall indicator of severity of RRB; the Short Sensory Profile (SSP), a 38-item parent-reporting questionnaire assessing the frequency of the child’s reactions to different sensory experiences. The items are scored on a 5-point Likert scale (1= “always,” 2= “frequently,” 3= “occasionally,” 4= “seldom,” 5= “never”). The overall score was used to find the overall sensory processing ability, with lower scores reflecting sensory processing difficulties; the Child Behavior Checklist (CBCL), a parent-reported questionnaire assessed emotional and behavioral problems. Items were scored on a 3-point scale ranging from 0 (“not true”) to 3 (“very true”); and four different intelligence quotient (IQ) scores from the Wechsler Intelligence Scale for Children (WISC-III-NL), the Wechsler Preschool and Primary Scale of Intelligence WPPSI-III-NL), the Snijders-Oomen Nonverbal Intelligence Test– Revised

(SON-R), the Bayley Scales of Infant Development (BSID-II-NL). All IQ assessments given were used to measure the levels of cognitive functioning (p. 649-650).

The results of the measures showed differences by gender. The ADOS and 3Di results showed that boys were 2.18 times more likely to receive an ASD diagnosis than girls. Data from all measures showed that girls were on average older, had higher levels of average IQ scores, and lower levels of autistic symptoms as reported by teachers on the SRS. Further gender differences were found on the SRS and parent-reported sensory symptoms on the SSP significantly predicted an ASD diagnosis regardless of gender. Higher scores on the RBS-R indicated that restricted and repetitive behavior tended to be less predictive of an ASD diagnosis in girls than in boys. In regards to behavioral concerns, girls were more likely to be diagnosed with ASD when they had higher total levels of behavioral problems (p. 651).

When concluding the study, the authors noted that some individual behavioral characteristics (i.e., RRB symptoms and emotional and behavioral problems) affected the ASD diagnosis differently in girls than in boys. This could potentially contribute to an under identification of ASD in girls. Other factors that may contribute to a lower probability of diagnoses in girls with ASD is that RRB symptoms were not as predictive of an ASD diagnosis in girls as in boys (p. 655).

Considering the strengths and limitations which included the use of a large sample of participants and the use of multiple diagnostic measures. Limitations may include that the participants were from clinical referrals, which did not reflect the general population (p. 655).

Young, Oreve, & Speranza (2018) discussed the clinical characteristics and problems in diagnosing autism in girls. They questioned what diagnosis problems existed between genders and sought existing peer-reviewed articles, as their current understanding of the pathogenesis and

clinical presentation of ASD was about males with autism. This was based on current studies that suggested a delay in diagnosis for females (pg. 1).

The studies reviewed focused on two main areas that supported gender differences within autism: Diagnostic problems and Clinical specificities of the female phenotype of ASD. Within these subjects, different subtexts were investigated. Within the area of Diagnosis Problems, the authors reviewed information on ASD and gender, ASD prevalence, sociocultural influences on ASD diagnosis, parents, teachers, and doctors, and classification and diagnostic tools. Within the area of clinical specificities of the female phenotype of ASD, subtexts found included the female phenotype and the topic of restricted, repetitive patterns of behavior, interests, or activities (pg. 2-4).

The data found in the articles supported the hypothesis that studies on autistic behaviors mostly include males (pg. 2). In the subtext of prevalence in ASD, literature suggested that the male/ female ratio within ASD was 4:1; within the spectrum, the sex ratio the most commonly encountered was 8–14:1. Further, when cognitive impairment is considered the sex ration was even lower, as 2:1. The current study noted that understanding of ASD was based on male-centered research, yet noted that any results showing a different ratio may be that some recent studies might have identified women with ASD more accurately, especially when there was an absence of intellectual disability (pg. 2).

Another consideration was that of socio-economic influences on diagnosis. Findings suggested that the diagnosis of ASD had dependent factors, namely the understanding of the difficulties as reported by healthcare professionals, symptoms exhibited by the patient, and steps toward a specialized consultation (pg. 2).

The expectations of parents were another consideration in diagnosis. It was suggested

that there were differences in social and education levels between boys and girls, specifically the presentation of girls within social behaviors (pg. 2).

Schools were noted as areas where social instruction begins, which led the authors to suggest that teachers could be important in the diagnosis of ASD. It was proposed that girls with ASD showed fewer problematic behaviors than boys, which deviates attention from them (pg. 2).

The study also considered the impact of doctors in regards to diagnosis. When researching, three factors were related to diagnosis: being male, having an intellectual disability ($IQ < 70$) and the existence of developmental regression. These factors were not inclusive of girls, specifically in regards to doctors looking towards males. The authors suggested broadening clinical presentation to better identify girls with autism (pg. 2-3).

The classification and diagnostic tools researched were found focused on the male phenotype of ASD. If a female were to present symptoms not included in the algorithm of ASD, they would not be included nor a diagnosis made. It was further suggested that diagnostic tools such as the ADOS should be researched and strengthened to focus on the identification of girls, specifically in symptoms such as camouflaging (pg. 4).

Considering the female phenotype and specific differences between boys, research suggested that similar differences appeared as early as preschool age. During primary school, specifically adolescence, these difficulties in girls showed fewer stereotypical autistic behaviors, and demonstrated a greater need for more social motivation and desire to be appreciated by peers than boys with ASD. These same girls showed better socioemotional reciprocity and a greater ability to camouflage. This could be one of two types: active (use of strategies to mask their difficulties, copying peers, and overcoming social communication deficits typical of ASD to “seem normal” and maintain friendships) or passive (spontaneous mimicking of behaviors such

as accents). It was also noted that girls with ASD who camouflaged lead to longer periods of stress, where girls were more at risk for developing anxiety and depression (pg. 3-4).

Another area of difference between genders was that of restricted, repetitive patterns of behavior, interests, or activities (RRBIs). The research suggested that girls demonstrate less RRBIs than boys. Other hypotheses suggest that boys and girls may have the same level of RRBIs, but differences in types. For example, a boy with ASD may like maps and trains, but girls may be interested in areas considered gender specific, like dolls or animals. A suggestion to identify an RRBIs was to discover if this activity caused social or academic problems, and asking parents/ caregivers what happened if the activity is prevented. The authors suggested that in order to be diagnosed, the girls needed to present behavioral problems, difficulties, and mental health problems at the same time as their male ASD peers (pg. 5).

When concluding the research, the authors noted that bias appeared to exist between girls and boys. Specifically in typically male studies, clinical tools, and differences between girls and boys influenced by sociocultural and familial factors. Further research should include ways to identify the female population with ASD and find a better understanding of the ways ASD presents itself in boys and girls (pg. 6).

A limitation of this study would include the time of the study. This study was completed in 2018. Further research has been completed since this study was conducted; additional research since then could have strengthened the original work.

Beeger et al, (2012) examined the timing of identification of autism in children, specifically in differences of sex. The hypothesis was that females with ASD would be diagnosed at an older age than males, with a secondary hypothesis that the difference would be even greater between individuals with Asperger's syndrome and PDD-NOS. Data was used from

the Netherlands, but the authors sought to replicate findings regarding the delay in identification of ASD in females in the United States (p. 1152).

Using a participant sample of 2,275 children (ages 0-18) and adults (ages 18-85) from all 12 provinces of the Netherlands, surveys were completed to examine the experience of individuals with autism in the Netherlands regarding diagnostic procedures, treatment, daily functioning and education. Surveys were completed by parents (n = 1,796), next of kin (n = 86) or individuals with ASD themselves (n = 202). The survey included 53 questions including diagnostic process, treatment, residential situation, schooling and employment (pg. 1152).

When analyzing the data from the surveys, child and adult groups were separated because of secular changes in diagnostic procedures and criteria. Based on the current sample, it was found that the average time between first signs of autism and identification was longer for females than males. It was noted that the findings may be skewed, as the age of diagnosis between adults and children is very different (adults diagnosed an average of 12.76 years later than children). Within the child group, children with autism had an earlier diagnosis, followed by children with PDD-NOS and Asperger's syndrome. Females had a 1.8-year delay in age of diagnosis in the Asperger group and there was no gender effect related to age of diagnosis in the PDD-NOS or autistic disorder groups (p. 1153).

Within the adult groups there was a 4.3-year delay in age of diagnosis in the Autism group, and no effect of sex on age of diagnosis in the PDD-NOS or Asperger groups. The adult group also showed a wide variation in age diagnosis with no participants diagnosed younger than 12 years, 142 who were diagnosed between 12 and 18 years, and 730 who were diagnosed when they were older than 18 years. There was not a sex difference found in the age of diagnosis in adults, regardless if they were diagnosed as children, adolescents, or adults (p. 1153).

The authors concluded that girls are identified later than boys among children with Asperger's syndrome, they did not find a delayed identification for girls with autistic disorder or PDD-NOS. However, in the adult group, females with autistic disorder were diagnosed later than males, but no delay was found for adult females with Asperger's syndrome or PDD-NOS. The age of first parental concern did not affect the sex differences, and the average time between first signs and diagnosis was slightly longer for females than males (p. 1153).

The limitations of the study by Beeger et al, was that the diagnostics come from self or parent reports. The participants memory of events in regards to diagnosis was also a limitation, especially in the adult group. The size proportions in each group were also a concern, with the females/males with Asperger' syndrome being 1/10 in the child cohort, but 1/5 in the adult cohort. No information on ethnicity or socio-economic status was included in the survey, which could also limit the results. Further implications of this study could be used by clinicians to diagnose girls with autism and improve diagnostics sensitive to female presentations of ASD.

Social Challenges and Camouflaging in Girls with Autism

Tierney, Burns, & Kilbey (2016) considered deficits that existed between males and females, in regards to social relationships and the management strategies of adolescent girls in social situations (p.73). The study was designed to see how girls with autism identified with social challenges within adolescence (p.75).

The study analyzed data from semi-structured interviews using Interpretative Phenomenological Analysis (IPA), which illustrated how a person interpreted their experiences (p.75). The researchers asked participants to engage in a sociogram, where they drew themselves as a circle and all friends as a triangle; the purpose was to create a concrete representation of participants' social closeness and friendships in relation to themselves (p.75).

All participants in this sample were females, between ages 13-19, lived in the UK, and had documented evidence of formal diagnosis of autism. Participants with a comorbid diagnosis were also included within the sample, as the authors noted comorbid disorders were common within the autism population. Ten males were included in the sample if they met criteria. All participants provided consent and participated in the process (p.75-76).

After the interviews were completed and analyzed, researchers discovered four superordinate themes and 13 subthemes. These four superordinate themes were: Experiences of the social environment, desire for friendships, overcoming challenges, and developmental tasks (pgs. 77-80).

Researchers noted that participants recognized the emotionally-intimate female peer-to-peer relationships, but didn't understand the rules of relationships. Participants noted that when rules were broken, they were identified as different, which in turn led to them feeling unable to fit into social situations. This behavior continued to demonstrate a gap in relations and ability to form friendships, leading to frequent peer-rejection and loneliness. A number of participants also developed mental health conditions as a result (p.80).

Considering the clinical implications of the study, the authors described that all participants interviewed used coping strategies to mask their differences. This allowed the children to be accepted in social situations, but cost each person mental health and emotional regulation challenges. The authors described the importance of mental health practitioners to look beyond camouflaging or masking support and provided strategies to identify the coping skills in females with autism (p.82). The authors also noted the need for diagnostic studies on the female brain, as females who met diagnostic criteria based on the male brain (p.81).

Participants noted that they developed strategies to appear socially-competent to others, such as masquerading strategies to hide/ overcome obstacles and ways to develop and maintain relationships (pg. 80). The same female participants noted that they easily related to peers during childhood. However, as the subjects reached adolescence, social situations became more difficult, leading to peer-rejection and mental health issues (p.81). The authors suggested that differences existed between adolescent females and males with autism along with different social expectations and norms (p.80).

Ratto, Kenworthy, Yerys, Bascom, Wieckowski, White, & Gutermuth (2018) added to research regarding sex-based differences in individuals with ASD, without a co-current intellectual disability (ID), and who also met criteria for ASD on one of two diagnostic measured (ADOS or ADI-R) (p. 1700).

The authors hypothesized that autistic traits may be “camouflaged” in females and that current diagnostics procedures were biased for females (p. 1699). They also predicted that the sample would not detect any differences in the total scores but that there would be item level differences for specific skills. Specifically, females with ASD would show a smaller number of RRBs than males but also have better play and conversational skills than males (p. 1701).

The participants in this study were chosen and identified from different sites across the United States: The Center for Autism Spectrum Disorders at Children’s National (Rockville, MD), the National Institute of Mental Health Laboratory of Brain and Cognition (Bethesda, MD), the Center for Autism Research at Children’s Hospital of Philadelphia (Philadelphia, PA) and research and clinical programs at Virginia Tech, including the Center for Autism Research (Blacksburg, VA). Participants were identified by clinic and research-based samples that gave an eventual sample of 228 children, both male (n = 114) and female (n = 114) (p. 1701).

The study assessed participants using two different diagnostic measures, and one diagnostic interview for the participants' parents. The ADOS included play and conversation-based assessment of social communication skills and autistic traits (p. 1701).

Children were rated by trained clinicians on a scale where 0= no evidence of impairment, 1= mild impairment, and 2-3= significant impairment. The ADOS scores were totaled and later compared to two cut-off scores, one for autism and another for the autism spectrum. Scores on the ADOS were reported in terms of how likely it was that behaviors were consistent with a diagnosis of autism (p. 1702).

The participants' parents completed the Autism Diagnostic Interview-Revised (ADI-R), a semi-structured diagnostic interview, which gathered information from both current and historical functioning, and focused on the years between ages four and five. Scores identified four domains: Reciprocal social interaction, communication, restricted, repetitive, and stereotyped patterns of behavior, and abnormalities of development at or before 36 months. The participants met criteria for ASD on ADI-R if scores met or exceeded the cutoff criteria in each of the four domains (p. 1701).

Considering the limitations of the study, the authors stated that limitations were found due to relying on the ADOS and the ADI-R to diagnose ASD. That is because these tools were designed and developed with a predominantly male sample. They noted that females in the studies were assessed and included when they had autistic traits similar to males. The authors described how autistic females displayed different patterns of autistic traits but could not be captured by the current diagnostic tools (p. 1708).

Tierney, Burns, and Kilbey (2016) explored the experiences of adolescent females on the autism spectrum and how they managed their social relationships (p. 73). The authors questioned

whether adolescent females with autism used social management strategies, particularly masking, to hide their socio-communication difficulties in order to fit in with their peers p.74). The prediction made was based on the Extreme Male Brain theory (EBM), which was that females on the spectrum may have a greater social drive and social abilities which motivated them to overcome socio-communication difficulties (p. 73 & 82).

The qualitative study from the U.K. utilized ten adolescent females formally diagnosed with autism and between the ages of 13 and 19 (p. 73 & 75). Participants were identified through the Child and Adolescent Mental Health Services (CAMHS) (p. 76). The authors developed a semi-structured interview tailored toward participants with social-communication needs (p. 75). It was also designed to see how girls with autism responded to the social challenges associated with adolescence. Ten participants were selected from a pool of 25; those who were not selected did not meet criteria, did not wish to participate, or were unable to be involved on the days of interviews (p. 76).

The interview asked participants to create a socio-gram, with themselves as a circle in the middle of the paper and all friends as triangles. This created a visual representation of the participants' social world and provided information that could not be provided from data analysis (p. 75).

The data was reviewed under procedures from the Interpretative Phenomenological Analysis (IPA) as this methodology aimed to understand how a person makes sense of/interprets their experiences within a given context. Codes and themes were developed, which helped form topics and delineated what these meant for the participants (p. 75).

Four themes and 13 sub themes emerged from the IPA and included: experience of the social environment, desire for friendships, overcoming challenges, developmental tasks. The

subthemes for “*experience of social environment*”, included: incommodious (causing inconvenience or discomfort), impenetrable (impossible to understand), misunderstandings, and mislabeling. The subthemes for “*desire for friendship*” were: context for befriending, challenges to developing friendships, and motivations for befriending. The subthemes for “*overcoming challenges*” were: external, support, innate skills, imitation, masking, repercussions of strategies. The subthemes for “*developmental tasks*” were: triggers for difficulties and sexual identity (p. 76).

The majority of the females in this study were motivated to have friendships. They recognized that at times they were not able to understand, or follow the rules within friendships. This left the participants with feelings of inadequacy and left out of social situations (p. 80).

Most participants developed social strategies that allowed them to fit into groups as competent to observers (p. 81). Gender specific challenges were also discussed. In childhood, many participants successfully integrated with peers, but by adolescence, social abilities began to change for participants; this may have led to alienation from peers, mislabeling behaviors and decline in mental health (p. 81). However, the authors noted that due to prior experiences, such as peer rejection and uncomfortable social situations, subjects developed coping strategies, such as masking to blend in with their peers (p. 82).

A limitation of this study was that all female subjects were diagnosed under a male based criteria for autism spectrum disorder. The authors indicated that their findings could not implicate all females with autism, as many girls with autism traits may not be formally diagnosed under current diagnostic standards (p. 81).

Considering the main strengths of the study, the authors found that this sample of ASD participants used strategies in social-communications, specifically techniques to mask their

differences. They also discovered that none of the techniques were evaluated under current ASD diagnostic assessments. The authors noted that this study provided questions to be explored in future research, such as whether girls with comorbid disorders or more severe deficits also use similar coping strategies in social settings, or if they did not have the ability to do so (p. 82).

Many researchers have considered the differences between genders and how autism displays within the genders. Wood-Downie, Wong, Kovshoff, Mandy, Hull, & Hadwin, J. A. (2020) investigated sex/gender differences in regards to camouflaging in children and adolescents, with and without an autism diagnosis (p. 3). Researchers posed this question: Was there a sex/gender difference in regards to camouflaging, and could camouflaging be an indicator of autism and used to facilitate earlier identification? (p. 3).

The study sample consisted of 84 children: 22 were boys with autism, 18 girls with autism, and 22 neurotypical boys and 22 neurotypical girls. All were between the ages of 8-14 (p. 4 & 5). The authors hypothesized that girls with autism would engage in higher levels of both behavioral and compensatory camouflaging (p. 3). The quantitative study used four different checklists for assessment including the Social and Communication Disorders Checklist (SCDC), the Wechsler Abbreviated Scale of Intelligence, Second Edition (WASI-II), the Interactive Drawing Test (IDT), the Reading the Mind in the Eyes Test, Child's Emotion Recognition Test (RMET-C) (p. 5).

The researchers worked in pairs with the participants at their schools, after they confirmed they would participate in the study. All tasks were completed in the following order (1) IDT, (2) RMET-C, (3) WASI-II. The tasks took between 45-60 minutes to complete. The checklists and assessments were described as follows:

- The SCDC a parent-report screening checklist designed to measure autistic traits in the general population. Parents answered questions with (0) not true, to 'quite or somewhat

true' (1), or 'very or often true' (2) to questions about their child's behavior in the last 6 months. Scores ranged 0-24 and a score of nine or above indicates the individual could have autism (p. 5).

- WASI-II measured intelligence and used verbal (vocabulary) and non-verbal subtests that generated a full-scale IQ.
- IDT measured social reciprocity. This test involved a drawing interaction between the researcher and the participant, taking turns drawing together. It was unstructured and scored by the number of turns taken. The scales for this test included: (1) reciprocal turn-taking (2) reciprocal interaction, (3) reciprocal interaction in the other's initiative, and (4) reciprocal flexibility. A higher score indicates more reciprocal behavior (p. 5 & 6).
- RMET-C, an index of social cognitive ability, measured Theory of Mind (ToM). The task included 28 pictures of an individual where only the eye region was seen, with four words below. The participants chose one word that best described what the person in the photo was feeling (p. 6).

Considering the results, the study found evidence that girls with autism/ autism-like traits used camouflaging, but not boys. They also found that girls with autism/ autism like traits had greater levels of social reciprocity than boys with autism. Further, girls with autism/autism traits had similar levels of social cognitive ability (ToM) to boys with autism, despite increased reciprocal social behavior (compensatory camouflaging) (p. 8).

The authors found both strengths and limitations to this study. A limitation included the small sample size, meaning that it was underpowered to find differences in IQ. Concurrently, the study used participants with autism/ autism traits who had a significantly lower verbal IQs than the neurotypical students. The Theory of Mind overall scores were not significantly lower in the

autism/ high autistic traits groups. This could suggest that the ToM task was not sensitive to differences, or that the two groups had similar ToM (p. 10).

The authors felt a strength of the study was participants with autistic traits but did not have a formal diagnosis were included. They also felt that future research should continue to include participants of this nature, and that of neurotypical males and females (p. 10).

The researchers concluded that they have provided further evidence about camouflaging in females with autism. They suggested that the findings may partly explain why many females receive an ASD diagnosis later than their male peers, which unfortunately limited the support they received (p. 10).

Other authors noted the use of camouflage among girls with autism. The team of Tubío-Fungueiriño, Cruz, Sampaio, Carracedo, & Fernández-Prieto, M. (2020), systematically investigated what researched-based evidence revealed about the camouflage effects and whether evidence existed to support the idea that camouflaging existed in females with ASD. The hypothesis put forth by the authors was that females with ASD displayed camouflaging behaviors to engage and resemble their peers.

The study used previously published peer-reviewed researched studies on this topic. Of the initial results from 4,536 studies, thirteen studies were selected for review (p. 3). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist guidelines were selected to perform a systematic review. The study itself consisted of three out of the 13 studies using a qualitative approach, while the remaining used quantitative methods (p. 3).

Analysis showed that females with ASD were more capable than males, in the areas of friendship and intimacy. Females also expressed a greater need for friendship, however they

noted this area was challenging, which may lead to increased camouflaging behavior, as females were expected to be more social and establish closer relationships. The research showed that long-term camouflaging effects could have consequences, such as reduced self-esteem, high anxiety, and depression. (p. 7).

The negative consequences included loss of well-being and self-esteem, emotional problems, which could be seen in both males and females with ASD. Females who camouflaged their feelings did not appear to report negative feelings and depressive symptoms. They also noted concerns about misdiagnosis in females with ASD (p. 7).

The authors discussed how executive functioning may be related to camouflaging and the differences between males and females (p. 8). The authors did not note any study limitations. Due to the fact that this study was a meta-analysis, one could question whether any studies that disputed the research were reviewed. A main strength of this study was the number of studies reviewed and included in the research. The authors narrowed from 4,536 to thirteen studies. They felt that their research supported the existence of camouflaging for females with ASD and that camouflaging had negative implications, such as misdiagnosis, and mental health concerns. (p. 8).

Schneid & Raz (2020) examined the meanings of *impression management* and *social camouflaging* and how these skills become normal coping mechanics and normalized for those on the autism spectrum (p. 1). Researchers questioned what differences existed between *impression management* and *social camouflaging* in individuals with autism, with specific attention to how it was used for coping and normalization. Qualitative data helped to understand the participants' experiences with ASD and examined whether the experiences included impression management or social camouflaging (p. 2).

The participants were 24 adults from Israel, at least 18 years old, who could communicate in spoken or written Hebrew. Twenty-two were formally diagnosed with autism, Asperger's, Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS), or autism spectrum disorder (ASD). Two were without a formal diagnosis, but self-identified as being on the autism spectrum. Demographics includes: 16–55 years ($M = 31$), and gender (54% women, 42% men, 4% other). Participants participated via multiple modalities either telephone, email, or in person (p. 2).

Upon reviewing the data from this study, the authors found that four themes existed pertaining to the topic of camouflaging. These themes were: impression management as a social asset; the ambivalence of camouflaging; the limits of impression management; and autistic forms of social communication that provide an alternative to camouflaging. The authors noted that they focused on impression management and camouflaging as important categories used by the respondents to connect to their experiences (p.3).

Many respondents noted they viewed their autism as a social stigma, even if it was a positive part of their identity. Falling under the theme of Impression Management, respondents also noted that they needed to play a “social game”, to fit in socially with their peers (p.3). Considering the negative aspects of being labeled as an individual with autism, the impression management and passing as normal aspects also meant that individuals felt something was flawed or faulty within the person (p.3).

Respondents noted that camouflaging was regarded as a tool in their impression management, but also as a technique for inclusion. One respondent noted that when she observed her peers, she could distinguish between the good kids and bad kids and was able to recognize and identify their behaviors (p.4).

Respondents remarked that ongoing maintenance regarding impression management and social camouflaging was something that caused strife in their lives. Their feelings continued to be conflicted which elevated feelings of being artificial and feelings that weren't truly theirs, as though they were on autopilot or being robotic. Respondents' true feelings and true self were not exposed, leading the respondents to further inner and external conflict (p.4).

The same respondents realized limitations to camouflaging and impression management. Even when they felt they did their best to fit in, the achievement wasn't enough in their eyes or in the eyes of others. This conflict led to the final theme: alternative forms of communication (p.5).

Many respondents noted literal understanding in social cues and communication. Respondents shared that asking trusted peers or adults to have statements moderated or explained to them directly helped them to understand the aspects of communication that may be misunderstood or taken too literally (p.5). It was also noted that recognizing any traits tied to their autism helped fight the stigma of being an individual with autism and helped them accept autism as a positive part of their identity (p.5). Many also felt that participating in a social group to communicate and understand other individuals with autism helped them to process and accept their identities (p.5).

The authors concluded with the idea that impression management and camouflaging were connected both internally and externally and should be seen not as only a coping strategy but as something that should be normalized (p.6). Strategies used by individuals with autism are used in social situations and also as a form of communication.

In consideration of whether or not camouflaging exists among other genders in the autism community, a study done by Dean, Harwood, & Kasari (2016), considered the social behaviors

of elementary school children in regards to camouflage. They conducted a comparative study that examined the extent of gender-related social behaviors in girls with autism who masked their symptoms (p.678).

The authors examined three research questions, beginning with to what extent did environmental factors such as gender-related social behaviors and activities play a role in helping girls with ASD mask their symptoms. Secondly, are girls with ASD camouflaging their symptoms and did they use behaviors to mitigate their social difficulties? Lastly the question was asked in regards as to whether the symptoms of ASD were more obvious and easier to detect in boys (p.680).

The participants selected totaled 96, and were later broken out into samples of (autism spectrum disorder = 24 girls and 24 boys, typically developing = 24 girls and 24 boys (p.678). Children with autism had a confirmed diagnosis of ASD, did not have an intellectual disability, and spent a minimum of 80% of the day in the general education classroom (p.680). The TD control group was made up of peers who also met gender, grade, age, and city of residence (p.680). These participants were randomly selected from teacher nominations for positive social skills (p.680).

The methods used for this particular study included a data sample of school-aged children from first through fifth grade, with and without ASD, living in communities around Los Angeles, Baltimore, Seattle, and Ann Arbor (p.680). Criteria to be included in the study was met by using the results of two standardized tests. The Autism Diagnostic Observation Schedule, Second Edition (ADOS-2), used to confirm a diagnosis of ASD. This test is a standardized, semi-structured play-based assessment of symptoms related to autism (p.680). Sub-test scores from the Stanford-Binet Intelligence Scale: Fifth Editions (SB-5) were measured using the abbreviated

version, the non-verbal and verbal IQ score (p.681). The Playground Observation of Peer Engagement (POPE) was also completed. The POPE is a timed behavior coding system that gives both quantitative and qualitative data from independent and blinded observers who watched the participants with and without ASD on the playground during recess for 10-15 minutes (p.681).

During the observations, participants were scored for three different engagement states: Game, where the child is playing a game with a peer, Joint Engagement, where the child is socializing with a peer, and Solitary, where the child is alone and not participating with peers (p.682).

The observational data compiled from the POPE, found evidence of gender differences in social behaviors. For example, the TD boys played differently from the TD girls, the social challengers differed between the boys and the girls with ASD. It was also observed that the male groups, either TD or ASD, exposed the social challengers, while the female groups were more apt to camouflage social challenges (p.685).

When contrasting the differences shown, the authors noted that while social differences were apparent between the TD boys and boys with autism, the female groups supported the idea of camouflaging. Girls in both groups fluidly moved between the social groups, in regards to the engagement states of the POPE; however, girls with ASD tended to flit between Joint Engagement and Solitary, while TD girls predominately stayed in Joint Engagement while moving from one social group to the next (pgs. 685-686).

The study supports the theory that camouflage exists, in that girls have a relative strength in social skills and masking in schools. Having access to peer groups can help girls increase their social interaction (p.687). However, the authors state that it is necessary to engage students with

practitioners to increase social skills and opportunities with peers. It is also necessary to not overlook or tolerate social challenges, as camouflaging would then not be proactive (p.687).

Study limitations included the size and scope of the participants, for both the TD and ASD groups. Data collected from the POPE was only from one set timed interval and compared to one peer participant. Further research and testing could have also increased the data compiled for this study (p.681).

Research completed by Jorgenson, Lewis, Rose, & Kanne (2020) elaborated on the differences between sex and camouflaging. They discussed how camouflaging led to individual benefits, improved social connections, and fitting in with others (p.4344). The objective of this particular study was to compare levels of camouflaging by sex and by diagnosis in both individuals with autism and their neurotypical peers. The overall goal was better understanding of camouflaging in younger individuals with autism (p.4347).

Participants selected in this study were both individuals with autism and neurotypical peers. As it was a study comparing the gender differences, the goal was a 1:1 ratio of male and females. But the ratio was 1:2.4 as compared to the actual population and cited in the work done by Frazier et al. (2014). The neurotypical participants were 28 male and 35 female. Participants with autism were selected based on survey responses from an autism clinical database, the Simons Foundation Powering Autism Research for Knowledge (SPARK), and an online cohort from SPARK. Once selected, participants were eligible if they were between the ages of 13-18, had an autism diagnosis, and did not have a diagnosis of intellectual disability (p.4347).

Neurotypical participants were recruited through social media and advertisements in local universities and were found to be eligible if they were between the ages of 13 to 18 and without

an Individualized Educational Program (IEP). Neither group was asked about other developmental challenges or mental health diagnosis (p.4347).

The participants completed two online surveys: Subthreshold Autism Traits Questionnaire (SATQ) and the Camouflaging Autistic Traits Questionnaire (CAT-Q). The SATQ is a self-reporting measure of 24-items used to assess autistic traits. This quantitative tool provides 4 point scaled scores on each reported item, with a 0 indicating “false, not true at all” to a 3, which indicates “very true”. The higher the score, the higher the autistic traits. It may also provide information about eye contact, expressive language, and others’ perceptions of a person. This tool was utilized to assess levels of autistic traits, rather than a measure of camouflaging (p. 4348)

The CAT-Q has 25 items that relate to camouflaged behaviors, such as copying body language, facial expressions or forcing eye contact. Items are graded on a 7-point scale, with 1 being “strongly disagree” and 6 being “strongly agree”. A higher score from the CAT-Q indicates higher levels of camouflaging (p.4348).

The author’s data analysis examined differences in levels of camouflaging between the autistic and neurotypical groups, including differences in gender regarding levels of camouflaging within and between both participant groups (p.4348). The CAT-Q scores showed a small but significant sex difference in camouflaging. A surprising result was the number of neurotypical participants. Females with ASD scored similarly in masking with their neurotypical peers than autistic males. The authors suggested that this could be an important sex difference where autistic females may appear more similar to neurotypical peers than autistic males do to their own peers (p.4350). Age, sex, and diagnosis were also considered as factors in these scores. The authors noted that while significant differences were not noted between the age groups of

autistic participants, differences were noted between neurotypical peers between the 13-15 and 16-18 age groups (pgs. 4349-4350).

Considering the limitations of the study, the sample size was small with a disproportionate number of males and females in both groups of autistic and neurotypical groups. The amount of demographic data collected was limited and the sample omitted individuals with a cognitive difference, as researchers suggested cognitive abilities may impact camouflaging (p.4353). The authors also did not discuss the interaction of neurotypical and autistic females in regards to social situations.

Cook, Ogden, & Winstone (2018) explored the social relationships of neurotypical and autistic females, through the experiences of how girls with autism live and manage through life through learning, friendships, and bullying experiences (p.302). The qualitative study was conducted through semi-structured interviews and later analyzed through a thematic analysis (p.304).

Of the 22 participants chosen for this study, there were 10 mother-daughter dyads and one father-daughter dyad. All were from the schools within the southeast of England. The ages ranged from 11 to 17 with an autism spectrum disorder diagnosis, and 6 participants with a comorbid disorder. Parents were also included in the data collection; all were over the age of 40 with various careers (p.304).

The study occurred at the participants' home school through semi-structured interviews, with broad, open-ended questions. The interview covered the following areas: experience of learning, experience of friendships and experience of bullying. The parents' interview questions include: their daughter's learning in school, their daughter's friendships, their daughter's experience of bullying and different school settings in relation to bullying (p.304-306).

When analyzing the data, the authors coded results and linked them to identified themes. The themes were: Motivation to have friends, challenges faced by girls with autism, and masking autism, as both a solution and a problem (p.306-307).

Through data analysis, researchers found the following patterns. For theme 1, *Motivation to Have Friends*: the girls noted they wanted friends and to fit in at school, mothers discussed how limited social skills and expectations of friendship held the girls back from their neurotypical peers (p.307).

Theme 2, *Challenges Faced by Girls with Autism*: the girls described a primary problem of relating to social groups, social isolation, and bullying. There was a bit of a difference, depending on school setting as some girls were mainstreamed and others went to a special needs school setting (p.308-309).

Masking Autism was the theme discovered. The authors found that autism was masked in one of two ways: masking as a solution and masking as a problem. Social communication was a factor in trying to fit in, as a solution to their problems at school. It also was noted that girls masked in order to avoid being labeled as autistic (p.309). Girls who masked in a way their parents described as problematic also noted to have had physical manifestations of stress and anxiety. Masking as a problem was observed more in mainstream settings and enabled girls to feel like they belonged. The masking may have resulted in missed symptoms and greater problems, like falling behind in school (p.309-310).

The results indicated that girls with autism understood friendship differently than their neurotypical peers. Many had trouble finding, making, and keeping friendships. These challenges were noted across school settings due to the girls not understanding the dynamics of social interactions. The social skills and lack of friendships could lead to bullying, as approximately

half of the subjects noted they had been bullied at school. Girls with ASD learned to adapt and mask to fit in, which in turn leads to other potential for problems such as masking due to stress and anxiety from feelings of inadequacy (p.310-312).

The limitations of the study included a small sample size from one location in England, along with the interview-based study model. The latter could imply that girls with poor communication skills may under-represent the whole population of girls with autism. The authors noted their findings supported the need for inclusion and the implication of interventions in school settings. Specifically in the areas of bullying and staff development (p.312).

The authors concluded that while the females with autism had different perceptions of friendship, the study demonstrated that they were motivated to develop friendships, yet more likely negatively affected by their social inadequacies. The authors noted a great need for schools to recognize the many challenges girls with autism face in areas of academics and social skills, specifically regarding the school experience, behaviors, and reducing the need to use masking behaviors (p.313).

Lai, Lombardo, Ruigrok, Chakrabarti, Auyeung, Szatmari, Happé, & Baron-Cohen (2017) continued camouflaging research by asking ‘what is camouflaging in autism?’ and ‘what are the required abilities and skills for camouflaging?’. The authors approached the subject by testing their hypothesis using data from standardized measures and observations (p.692).

The participants were 30 females and 30 males with autism, between the ages of 18-49 years. None had an intellectual disability and each was matched by age, verbal IQ (VIQ), performance IQ (PIQ), and full-scale IQ (FIQ), along with a formal clinical diagnosis of autism (p.692). Participants were assessed using the Wechsler Abbreviated Scale of Intelligence to find the WIQ, PIQ, and FIQ. The ADOS Module 4 was also used to quantify current autism

behavioral characteristics. Participants completed self-report questionnaires, such as the Autism Spectrum Quotient (AQ) that measured self-reflection of autism. The authors selected the 21-item Beck Anxiety Inventory (BAI) to measure symptoms of anxiety and the 21-item Beck Depression Inventory (BDI) for depression (p.693).

The authors found that operationalized camouflaging measures were not correlated with age, VIQ, PIQ, or PIQ. Data showed that women with autism used more camouflaging than men, with a variability found within the groups. An interesting discovery related to the subject's association with camouflaging. Men with depression showed greater camouflaging, while women with better signal-detection symptoms showed more camouflaging (p.696).

In analyzing data for individual differences, the degree of camouflaging was independent of age and IQ, in both men and women without intellectual disability. The authors noted on-average higher degree of camouflaging for women over men with autism, but the authors were not able to determine what contributed to this difference; it may have been due to socioeconomic factors or gender expectations may have played a factor in this difference (p.698).

Considering the greater number of women who camouflage Hull, Lai, Baron-Choen, Allison, Smith, Petrides, & Mandy (2020) hypothesized that females with autism would camouflage more than males with autism. They sought to determine two things: gender differences in self-reported camouflaging behaviors for both autistic and non-autistic adults (including those who are non-binary) and to examine whether gender differences in camouflaging autistic traits reflected underlying levels of traits and if it was comparable across diagnostic groups (p.354).

The measures used in this study included demographic questionnaires and two autism specific questionnaires, the Camouflaging of Autistic Traits Questionnaire (CAT-Q) and the

Broad Autism Phenotype Questionnaire (BAPQ). The CAT-Q, a 25-item self-report that measured the strategies used to camouflage autistic traits and was composed of three factors (Compensation, Masking and Assimilation) (p.354).

The BAPQ, a 36-item self-report questionnaire, measured traits according to the broader autism phenotype (BAP). BAP characteristics come with a greater liability of autism and are found across the autism population and in relatives of those with an autism diagnosis. This questionnaire has been found to be a reliable measure of autistic-traits across the population, especially in autistic individuals (p.354).

Participants were recruited through social media, the Cambridge Autism Research database, and through word of mouth. Participants must have had an official diagnosis from a healthcare professional; self-diagnosed applicants were excluded. Those with an official autism diagnosis provided the diagnostic label (autism or Asperger's), their identified gender (male, female, or 'other gender'), age of diagnosis, and the type of healthcare professional who provided the diagnosis (p.354).

When analyzing the data, the authors found that this was the first study to compare not only autistic males and females, but also non-autistic men, women, and non-binary people. It was also discovered that autistic females had a higher camouflaging score than that of autistic men, which supported the hypothesis that autistic women use more masking strategies to adapt socially with others. Non-binary people were found to have a higher Total CAT-Q score than females in age only, which suggested that these individuals have greater risk for camouflaging, in regards to negative outcomes. However, the sample in this study was very small, which may have limited the results. It was also suggested that these individuals may have more autistic traits, which may have reflected the higher instance of camouflaging. Gender differences overall

were small, specifically demonstrated by non-autistic males with higher levels of camouflaging, versus non-autistic females. The control in this group did not suggest autistic traits. In the female gender group, data suggested that autistic females demonstrated higher levels of camouflaging compared to non-autistic female peers, suggesting that the link to autism and camouflaging. However, there was no noted difference between autistic and non-autistic males; similarly, between autistic and non-autistic non-binary participants. The overall data for gender differences suggested that while all groups used camouflaging, the greatest use of masking and camouflaging to socially assimilate was from females with autism (p. 360).

The study was limited by using adult participants with access to an online questionnaire. Participants were allowed to write their responses. The questionnaires were only completed in English. Participants self-reported their diagnosis and it was not fact checked. The demographic did not include children or adolescents (p.361).

Bernardin, Mason, Lewis, & Kanne (2021) explored the adolescent camouflaging experience, expanding studies on adults. The authors questioned if a late or missed diagnosis in females highlighted changes in levels of camouflaging. Researchers compared camouflaging motivations and consequences by sex and diagnosis in autistic and neurotypical adolescents through questionnaires and interviews (p.2).

The measures used in this study were semi-structured interviews and an online questionnaire. Participants between the ages of 13-18 years with a self-report of no intellectual disability were eligible. Participants with autism were recruited through the Simons Foundation Powering Autism Research for Knowledge (SPARK) database, while neurotypical participants were recruited through email announcements at universities in the Midwest and through social media. All who completed the online questionnaire were asked to participate in a semi-structured

15-minute follow-up interview. Open-ended questions were used without the words “autism” or “camouflaging” were used unless introduced by the participant (p.3).

Zoom Video interviews were recorded, which allowed the authors to transcribe and review at a later date. Investigators noted potential themes to responses in coded data, which was discussed during analysis. Comparisons found overarching themes linked to common motivations to use camouflaging (p.4).

During the questionnaire and interviews, participants were asked “Why do you change the way you act in social situations?”, which helped form three themes: acceptance, avoiding negative experiences, and avoiding negative perceptions (p.4).

The study had varied results, which included (1) motivation for camouflaging, (2) positive results from camouflaging, (3) negative consequences of camouflaging, (4) feeling after camouflaging, (5) perceived difficulty of camouflaging (p.4). The most common theme for all participants in the area of motivation for camouflaging was acceptance, however it was not the most common theme within each participants’ group. For autistic males (29%) and neurotypical females (48%) acceptance was noted as the most common theme. Autistic females, however, chose avoiding negative experiences as the most common at 36%. Autistic males (24%) also stated that avoiding negative experiences was a reason to camouflage, but the reasoning was different for both groups. Males with autism started camouflaging to avoid negative experiences due to not wanting to upset others. Girls shared that the reason was to avoid bullying or teasing. Autistic males made up a small percentage of participants who were unable to identify a reason for camouflaging (p.5).

Four main themes emerged when considering positive consequences for camouflaging: avoiding negative consequences, friends, being perceived positively, and having positive

interactions with others. The most common theme was being perceived positively. Neurotypical males (27%) and females (47%) stated this was their biggest positive reason for camouflaging. Only 12% of autistic males and 9% of autistic females shared the theme to make or keep friends (p.6).

In consideration of negative consequences, two main themes appeared: feeling bad and feeling inauthentic. The patterns that appeared from these themes, showed that neurotypical men (57%) and females (47%) felt that being inauthentic was the most common negative consequence (p.8). However, only 8% of autistic males and 26% of autistic females shared this feeling (p.9). This group was more likely to respond that they felt drained, tired, or felt negative emotions after camouflaging (p.9).

When participants were asked about the feelings felt after camouflaging, four themes again emerged: (1) positive emotions, (2) negative emotions, (3) feeling neutral, and (4) feeling drained. Participants were not asked how they felt, rather they were given a list to see what applied to them. Autistic participants were less likely to report positive feelings and were more likely to feel drained after camouflaging in social situations. The authors noted an important distinction between feeling negative emotions and feeling drained, as the latter was a physical response to camouflaging, rather than an emotional reaction. Of all groups, females with autism were more likely to describe feeling negative or feeling drained after camouflaging (p.9). The responses from male and female participants with autism were different from those neurotypical male and female peers. Differences were also noted regarding, where males reported positive or neutral feelings after camouflaging, while the autistic females reported no positive feelings (p.10).

The last focus of this study was the perceived ease of camouflaging. All autistic males reported an ease to camouflaging, while only one autistic female reported camouflaging was easy in social situations, and three reported that it was difficult. One stated it depended on the situation. Three neurotypical females reported this to be easy, and only one neurotypical male stated the same (p.10).

The authors concluded that this study highlighted the negative consequences of camouflaging for adolescent females and that patterns exist related to sex and diagnosis of autism. The patterns revealed different motivations and consequences of camouflaging in both autistic and neurotypical participants (p.13).

The authors discussed the limitations and direction for future research. Limitations included that the sample consisted of only individuals who identified as cisgender, meaning they identify with the sex assigned to them at birth. The study also was disproportionate in sex (gender) distribution across both groups. Socio-economic status and race were also not a factor in this study. Further research should include all of these factors. Further research could include participants who identify as other than cisgender, including nonbinary. (p.13).

Perry, Mandy, Hull, & Cage (2021) considered nonbinary gender in their study on using the Social Identity Theory to examine the relationship between camouflaging and autism-related stigma (p.1). Of the 223 participants, 130 (58.3%) identified as female, 53 as male (23.8%), and 39 as non-binary (17.5%). One participant preferred not to disclose (0.4%). The primarily white participants lived in the United Kingdom, and were university educated with ages ranging from 18 to 65 years with an ASD diagnosis between 2 and 63 years (p.3).

The study aimed to find whether camouflaging was identified as an individual response to autism-related stigma. The authors hypothesized that: (1) stigma positively related to

camouflaging, (2) camouflaging mediated the relationship between stigma and wellbeing, (3) individualistic strategy use positively related to camouflaging. (p.2).

Recruitment was done with online and offline communities through adverts on social media, emails through autism-based community groups, charities, and word-of-mouth. All participants consented before completing an online survey, self-identified as a “person with autism” or “autistic person” in the survey, and preferred “identity first” language (57.8%) or had no preference (28.5%) (p.3).

The tools used to gather data included demographic data and the results of the following Likert scales:

- The Collective Strategy Use, a 13-item measure of collective strategy measured expression of community or community pride (p.4).
- Stigma Consciousness Scale assessed awareness of stigmatized status. The evaluation was adapted to become applicable to autism, as the original was based on mental illness (p.4).
- The Camouflaging Autistic Traits Questionnaire (CAT-Q) a 25-item measure of self-reporting camouflaging (p.4).
- The Warwick-Edinburgh Mental Wellbeing Scale (WEM-WBS) a 14-item measure of psychological well-being (p. 4).
- The Ritvo Autism and Asperger Diagnostic Scale (RAADS-14) is a 14-item screening tool for autistic characteristics, with items relating to experiences of social interactions and sensory stimulation and routine (p.4).

The results of the measures indicated that greater perceived autism stigma predicted higher levels of self-reported camouflaging, and that higher individualized and collective

strategy use also predicted more camouflaging (p.5 & 6). The findings showed that those with autism may have pride in being autistic, but camouflaged to be accepted socially. The findings supported a relationship between camouflaging and the stigma of having autism (p.7) It was also noted that greater autistic characteristics predicted increased use of camouflaging, but this was not noted as significant with stigma. The findings could indicate that the characteristics of autism related to camouflaging through indicators of social stigma (p.8).

The study concluded that further research should consider stigma and camouflaging which could have further implications for clinicians and practitioners who work with the autism community. Limitations existed in this study. While researchers included nonbinary people, the participants were mostly white and college educated. Further studies should include those of varying socioeconomic backgrounds. In addition, all participants in this study were adults, with no adolescents considered (p.8).

Hull, Petrides, and Mandy (2020) considered the cognitive abilities of adolescents in regards to camouflaging. The authors questioned what cognitive and individual characteristics predicted self-reported camouflaging in adolescents with autism (p.525). They also theorized that adolescents with a greater Theory of Mind (ToM) would camouflage more than those with limited ToM (p.529). The study was completed using 5 different measures. The first was Camouflaging Autistic Traits Questionnaire (CATQ), a 25-item self-reported measure of camouflaging tendencies that was evaluated the following: Compensation (the use of strategies to compensate for social difficulties associated with autism), Masking (the use of strategies to hide autistic characteristics and/or present non-autistic characteristics), and Assimilation (the use of strategies to fit in with other, non-autistic people). While not yet validated with adolescents, the self-reported CAT-Q scores were used (p.525).

The Behavior Rating Inventory of Executive Function, Second Edition (BRIEF-2), a 63-item measure of executive function difficulties, used for children aged 5-18, collected parent reports. The measure used nine subscales to show different aspects of executive functioning and provide impairment score cut-offs (p.526).

The Strange Stories task, which is a ToM measure, measured the participants' ability to understand the mental states of others using short stories of everyday situations (p.526)

The Wechsler Abbreviated Scale of Intelligence, Second Edition (WASI-II) a standardized measure of intellectual ability which could be used with children and adults aged 6–90 years. The authors noted that it demonstrates consistency for both groups of people (p.527).

The last measure was the Social Reciprocity Scale (SRS), a 65-item standardized parent-report of a child's autistic symptoms (p.527).

All adolescent participants in this study had a confirmed formal diagnosis of autism, lived in the United Kingdom, and were recruited in a variety of ways (social media, health services, and word-of-mouth). Confirmation of formal diagnosis was done through medical records, educational records, or details provided from the family. Participants with an intellectual disability were excluded. Of the 58 participants, 29 were female, between the ages of 13-18. Demographic information, such as ethnicity, inclusion into mainstream classes, and socioeconomic status was not given (p.525).

The study was completed in one of three locations: the participants home, school, or a testing room at the university. Measures were administered by trained PhD students, where the adolescents completed the WASI-II, the Strange Stories task, and the self-report CAT-Q. Parents completed the BRIEF-2 and the SRS. The time for the measure averaged between 1-3 hours (p.527).

Based on the data analysis, researchers discussed that camouflaging may begin in adolescence and grow into adulthood. For participants between the ages of 13-18 there was no significant connection between age and self-reported camouflaging, which was the hypothesis of Hull et al. (2020). Researchers suggested that younger adolescents may camouflage and it may increase during adolescence. Cognitive and social differences between the ages of 13-18 were noted, but self-reported camouflaging remained consistent. IQ did not connect or predict any measure of camouflaging in this study (p.528).

Considering executive functioning, BRIEF-2 results indicated a higher total camouflaging score, and negative predictive relationships between executive function difficulties and masking. Hull, Petrides, and Mandy (2020) suggested that executive function abilities may underlie all aspects of camouflaging to some extent. This association between executive functioning and camouflaging suggested that those with impairments in executive functioning may find it more difficult to camouflage their autism (p.529).

Theory of Mind was not predictive of any area of camouflaging, which contradicted the study hypothesis. This fact suggested that camouflaging may be influenced by internal factors and processes, rather than the consideration of others' perceptions (p.529).

A strength to this study was the data considering the relationship between cognitive factors and self-reported camouflaging in adolescents with autism. Considering age, IQ, autism severity, and balanced gender participants was also a strength. Limitations of the study indicated the need for future studies considering cognitive development and camouflaging, and social interactions within a larger sample of participants (p.530).

Jedrzejewska and Dewey (2021) analyzed the social behaviors of individuals with autism both in person and online. The study questioned whether adolescents between the ages of 13 and

19 self-reported more or less camouflaging online than offline; and described what experiences in regards to camouflaging online and offline. The purpose of this study was to investigate camouflaging both online and offline with intent to inform educational practices that support adolescents with autism (p.2-3).

This mixed method study used both quantitative and qualitative methods. The quantitative portion was performed by having the 42 autistic and 158 non-autistic adolescents complete an online questionnaire. All participants were between 13 and 19 years old with a formal autism diagnosis confirmed by the participants' schools.

Camouflaging behaviors were measured through the Camouflaging Autistic Traits Questionnaire (CAT-Q). The CAT-Q measured the extent that an individual camouflages, modified to reflect social media environments, based on responses to 25 statements to the CAT-Q. Participants with high sub scores from the CAT-Q were selected to take part in the qualitative phase because the scores related to high functioning autism. Those with scores indicating moderate to severe learning difficulties were not included, as a high level of language comprehension was needed to complete further questionnaires (p.3).

Researchers created the 'Social Media Intensity' scale, which was adapted from the Facebook Intensity Scale. This scale measured the extent to which an individual engaged in social media, with eight statements of agreement or disagreement on a 5-point scale (p.5).

Other measures included the Social Media Prior Contacts vs. Meeting New People Scale. This measured how participants used social media platforms, including Facebook, Snapchat, and Twitter by measuring seven items on a Likert scale. (p.5).

The Social Media Activity Scale was developed to distinguish between active and passive use. Passive referred to using social media only to view others' content compared to active use

where participants interacted with other users. This scale considered responses to eight questions about social media use (p.5).

Lastly, the participants completed a semi-structured interview focused on identity, experiences with diagnosis, motivations, techniques, consequences of camouflaging when using social media, and how friendships and relations were formed (p.5).

Four themes emerged as a result of this study: The Supportive Role of Friends, Influence of Social Norms, Masking and Freedom on social media. All themes related to the concept of camouflaging. In regards to relating to positive and negative motivations to camouflaging, the themes of The Supportive Role of Friends and Influence of Social Norms, supported these motivations. The masking themes supported the theory about why adolescents with autism camouflage and how it related to their behaviors. Considering Freedom on Social Media helped demonstrate the social landscape of the experience and motivation for camouflaging when using social media (p.7).

The authors found a significant number of online camouflaging behaviors within the autistic participants (a mean = 93.26 of adolescents with autism to the mean = 82.93 of non-autistic adolescents). Camouflaging was most significant among females with autism versus their male adolescent counterparts; females, mean=90.24 and male, mean 77.65 (p.6). However, the authors noted that while the participants with autism showed greater use of camouflaging than their non-autistic peers, research indicated less camouflaging online than in person (p.12).

The findings showed higher scores on the CAT-Q for young people with autism compared to the non-autistic participants, which supported the authors' hypothesis. The findings also highlighted the potential for comprehensive understanding camouflaging. Research indicated that adolescents camouflaged less online than in person. Overall, participants noted

greater feelings of being themselves when communicating with others online could utilize social media in a positive way. (p.12-13).

A strength discussed in this study was the inclusion of both male and female autistic and neuro-typical participants. A limitation of this study was that the sample for both groups did not include many female participants (p.14).

Camouflaging was also considered by Halsall, Clarke, & Craine (2021) who examined how girls with autism educated in resource rooms and in the mainstream classroom used camouflaging strategies. Halsall, Clarke, & Craine (2021) wanted to discover the motivation for girls to camouflage and understand the consequences to camouflaging (p.2).

Semi-structured interviews determined how girls with autism camouflaged autistic behaviors to manage social situations (p.1). Participants chosen for this study were eight triads, made up of the participants, their parents, and their teachers. The girls were between the ages of 12 and 15 years old from three different schools in South-East England (p.2). The parents were all between the ages of 30-49 years. Teachers who demonstrated strong rapport with the girls were chosen (six were teaching assistants and one educator had a strong relationship with two participants). They were chosen not only for the close connection but also based on the amount of time spent working with the students (p.3). All participants had a clinical diagnosis of autism, along with other comorbid disabilities, and attended school in both a resource room and a mainstream classroom. The girls were given formal measures of cognitive ability, social communication needs, and friendship quality (p.2-3).

When reviewing the intelligence data from the WASI-II, four girls scored in the average range, while four scored below average range. The SCQ scores showed that only three of girls obtained scores above the cut-off for possible autism. They were still included in the study, as

they had a formal diagnosis of autism. The FQS indicated that the girls rated friendship positively (p.3).

The measures were completed through semi-structured interviews for all the triad groups (participants/parents/ educators) consisting of three parts: (1) interests and friendships, (2) camouflaging and (3) school views and experiences. Interviews were followed by completing the Camouflaging Autistic Traits Questionnaire (CAT-Q) (p.3). Participant's observations were completed during resource room classes and mainstream classes, or social activities. The authors met with the girls after the observations, and administered the WASI-II and then the FQS. Finally, the educator and parent interviews were conducted (p.4).

The educator interviews were created from literature on camouflaging strategies autistic girls use to negotiate their learning and social experiences in school and divided into four sections: (1) involvement in class based learning and camouflaging skills, (2) relationships and camouflaging, (3) experiences and camouflaging in different contexts (resource base classes, mainstream classes, home) and (4) positive and negative impacts of camouflaging. Each question was supported by prompts to deepen discussions (p.4).

Parent interviews were developed from camouflaging literature approaches that ASD girls need to navigate social situations. Questions were divided into four sections: (1) diagnosis and the impact of autism on their lives, (2) relationships before and since joining the resource base, (3) camouflaging skills, including differences between presentations in different contexts and (4) positive and negative impacts of camouflaging (p.4).

Following data analysis, the authors found four themes: 1: inconsistencies, contradictions and conflicts in attempts to camouflage; 2: using camouflaging to overcome challenges in making and maintaining friends; 3: camouflaging learning needs and the challenges of learning

and inclusion; and 4: consequences of camouflaging on social interaction, learning and mental health (p. 5-7).

The results of the study demonstrated that girls in both mainstream and resource room classes attempted to use camouflaging strategies to hide autistic characteristics. These attempts were inconsistent and ineffective. However, the authors found that while stakeholders (girls, educators, and mothers) were all similar, a slight difference between the mothers and the girls' camouflaging behaviors was noted between home and school. Educators also felt that camouflaging was not used as widely in resource rooms, but the girls reported they used it across all school settings. It was also discovered that girls used camouflaging inconsistently. This was noted by both mothers and educators. Inconsistencies were discovered in girls camouflaging immature interests, and based on setting (resource versus mainstream). The girls demonstrated the desire to fit in, but they were also observed promoting some autistic identity in mainstream classes, which further demonstrated the inconsistencies found in the study (p.9).

The girls also wanted to remove their identity from peer interactions in resource-based classes which reduced the effectiveness of social interactions in mainstream classes, effectively being excluded socially in two settings. This was noted as a negative consequence in regards to camouflaging. It was further discovered that camouflaging attempts were misinterpreted resulting in negative consequences. This was noted mostly in mainstream classes, where the level of support in social situations was missing. The authors believed this could inhibit long-term social emotional and learning growth (p.10).

A limitation of the study was the small sample of adolescent girls on the autism spectrum, with no same-aged neurotypical peers, nor comparing of boys with and without autism (p.11).

Sedwick, Hill, & Pellicano (2019) considered the implications of socializing in girls with autism in regards to friendship. Two questions were raised in consideration to this study: (1) what comparative differences in friendship existed between autistic adolescents and their neurotypical peers, (2) do these friendships differ even more between genders for both diagnostic groups (p.1121).

The mixed-method study used questionnaires and semi-structured interviews, including : (1) the SRS-2 School-Age Form (SRS-2), a 65-item questionnaire assessing social and behavioral difficulties associated with autism; (2) the Friendship Qualities Scale (FQS) used to assess adolescents' perceptions of their best friendship through 23 items, covering five components of friendship: companionship, conflict, help, security, and closeness; (3) the Revised Peer Experiences Questionnaire (RPEQ), a 18-item questionnaire assessing the frequency of overt and relational bullying behaviors that a participant both engaged in and was subject to (p.1122).

The semi-structured interviews were compared of two parts: (1) friendships and conflict, focusing on open-ended questions about adolescents' friendship experiences and (2) critical incidents, focused on conflict in young people's relationships by identifying two specific experiences with peers, one positive and one difficult, and asked to discuss them. Participants described conflict experiences in detail and discovered how they managed the conflict (p.1122).

Recruitment of the 102 participants between 11 and 18 years was through community contacts. All had attended mainstream schools within the last two years, or had transitioned from mainstream to a special school within high school. All obtained Full-Scale IQ scores >70 on the Wechsler Abbreviated Scales of Intelligence – 2nd Edition (WASI-2), and had a clinical diagnosis of autism (p.1122-1123).

The authors analysis from both the quantitative and qualitative data found gender dependent differences in autistic adolescents' friendships (p.1127). They discovered that girls with and without autism had similar conflicts and friendships. This was not true for boys with and without autism. The study also showed that autistic adolescents experienced more conflict than typical adolescents (p.1128).

The analysis of the FQS showed significant differences between girls and boys, regardless of diagnosis. Girls rated friendships and clothes stronger, which is consistent with neurotypical gender differences. The authors suggested that the results showed that autistic and neurotypical girls demonstrated similar social experiences, opportunities, and challenges. Regardless of diagnosis, girls have close friendships. However, autistic girls have fewer close friendships than their neurotypical peers (p.1128).

Considering participant conflict, autistic adolescents had more peer conflict than their neurotypical peers. Participants noted feeling as though peers punished them for not understanding social situations, or they were ignored by peers who were once friendly. The greatest level of conflict was found when in overt situations, more common among boys than girls. The authors noted that overt conflicts may be easier to identify and report than relational conflict. The authors theorized that girls with autism may have greater levels of insight and social awareness than boys and could be more sensitive to relational conflict. Also, the nature of conflict that girls with autism experienced may have been elevated because it impacted them significantly (p.1128).

The findings further suggested that autistic girl friendships were qualitatively different than those of autistic boys, as evidenced by both questionnaire and interview data. Girls with autism were similar to their neurotypical peers in relational conflict, while boys faced more overt

situations. The pattern of findings mirrors research in neurotypical adolescents. The authors suggested that girls with autism use more camouflaging than boys with autism. The study illustrated a significantly different gender approach to social experiences for adolescents with autism. Further research should consider the development of gender roles in adolescents and the long-term health consequences resulting from conflict and camouflaging. The limitations such as the sample size, race, and socio-economic status should also be considered (p.1129).

Mental Health Concerns from Camouflaging

Beck, Lundwall, Gabrielson, Cox & South (2020) explored evidence to suggest an association between camouflaging behaviors and poor outcomes in mental health, daily functioning, and accessing mental health care. The authors studied women with autism who camouflaged their autistic traits to determine if they had more mental health concerns, thoughts of suicide, and daily life struggles (p.809).

This study was done through a recruitment of 58 women with a mean age of 25.2 years (range 18-42) and a mean IQ of 114.60 (range of 89-140). Eighteen participants (31%) received a formal diagnosis of autism spectrum disorder. Ten participants received this diagnosis in childhood, four in adolescence, and four in adulthood. The majority of the participants (63%) also had a comorbid disorder, such as anxiety, depression, or attention-deficit/hyperactivity disorder (p.813).

Participants were recruited through university-based and private mental health clinics, social media, and through a residential support program for autistic adults. Participants initially completed a self-report questionnaire using an online survey platform. This platform recorded results relating to autism and also directed to a custom questionnaire regarding demographics,

treatment, health, and social history. Participants were paid for both online and in person time (p.813).

Nine different measures were used to determine if camouflaging efforts led to poor mental health in women with autism. The first measure was the Broad Autism Phenotype Questionnaire (BAPQ), a 36-item report measuring autism-related traits (p.811).

The Depression Anxiety Stress Scales 21 (DASS-2) measured psychological distress using 21-items from the self-report DAAS. Respondents rated experiences of seven symptoms of depression, anxiety and stress over the last week (p.812).

The Suicidal Behavior Questionnaire–Revised (SBQ-R), a 4-item report measured suicidal behavior considering measurements of suicidality. Items assessed life-time incidence of suicidal ideation, threats, and suicide attempts, and the probability of future attempts (p.812).

To demonstrate functional challenges, the World Health Organization Disability Assessment Schedule, Second Edition (WHODAS 2.0;), was completed with 12 face-valued questions to measure disability or dysfunction in 6 areas: cognition, mobility, self-care, getting along, life activities, and community participation (p.812).

Clinical methods also measured autistic traits. The Autism Diagnostic Observation Schedule, Second Edition, Module 4 (ADOS-2) was used due to its superior sensitivity (90.5%) and specificity (82.2%) (p.812).

Participants rated themselves by using the Autism-Spectrum Quotient (AQ), a 50-item self-report that measured personal traits in autism, such as social skills, attention switching, attention switching, attention to detail, communication, and imagination (p.812).

As the authors theorized about camouflaging for females with autism, they used the Camouflaging Autistic Traits Questionnaire (CAT-Q), a 25-item self-report that measured social

camouflaging behaviors including successful and unsuccessful camouflaging attempts based on intention (p.812).

Lastly, the Wechsler Abbreviated Scale of Intelligence, Second Edition (WASI-II) provided a brief, valid IQ measurement (p.813).

The results of this study showed that many participants reported psychological distress, such as depression, anxiety, and stress, along with suicidality, and reduced daily functioning. The study also suggested that camouflage was linked to degree of effort and not to the severity of autistic traits. The broad sample of participants found that women with mild autistic traits showed a significant association between camouflaging and suicidality, but only in participants who reported camouflaging behaviors to a high degree (p.816-817). The authors discussed the high prevalence of mental health concerns and raised questions about whether these concerns were common among women with autistic traits, or if autistic traits were common among women with mental health concerns, or both (p.817).

The authors suggested that their findings supported the idea that camouflaging efforts did exist in women and that the behaviors may often be adapted to social inclusion, but cause psychological distress. Many women with autistic traits described camouflaging as producing negative consequences (p.817).

The study limitations included a large number of measures and a limited range of subjects to represent age, cognitive ability, ethnicity, and socioeconomic background. Children, people of color, those with a cognitive disability, or people in a lower economic background were not included. Researchers also noted that the measures were only used once and self-reported data was not validated. The study also did not show change over time but only the snapshot of the time when the study was conducted (p.818).

The authors felt the study strengths included a unique and inclusive sample of women, from clinical services, some diagnosed, and some undiagnosed but all had demonstrated successful camouflaging techniques (p.818).

Cassidy, Gould, Townsend, Peloton, Robertson, & Rodgers (2019) researched deeper into the mental health needs of camouflaging autistic traits in females. They hypothesized that those with high levels of autistic traits were more likely to camouflage in social settings, which in turn created at-risk behaviors linked with mental health problems and suicidal thoughts and behaviors (p.3639).

The 277 participants chosen for the study were UK undergraduate psychology students, between the ages of 18-23 years and included 86.9% being female (p.3640). All were recruited from different universities in the United Kingdom (Nottingham, Newcastle and Coventry) directly from the university psychology departments (p.3639).

The tools used for the study included the Autism Spectrum Quotient-Short (AQ-S), a shortened 28-item version of the 50-item Autism Spectrum Quotient (AQ), both which measure self-reported autistic traits; the Camouflaging Autistic Traits Questionnaire (CAT-Q), a 25-item self-report that measures social camouflaging behaviors that were both successful and unsuccessful camouflaging attempts; the Interpersonal Needs Questionnaire (INQ-15), another self-report questionnaire that assesses ‘thwarted belongingness’ and ‘perceived burdensomeness’; the Patient Health Questionnaire-9 item (PHQ-9), a self-reporting scale used to assess current depressive symptoms aligned with the DSM-V diagnostic criteria; the Generalized Anxiety Disorder-7 item (GAD-7), to self-report current generalized anxiety symptoms; the Suicide Behaviors Questionnaire-revised (SBQ-R), a 4-item self-report

questionnaire that assesses lifetime suicidal behaviors, suicide ideation over the last 12 months, threat of suicide attempt, and likelihood of future suicidal behavior (p.3640-3641).

Based on the results, the authors suggested that camouflaging was indirectly associated with suicidal thoughts and belonging, as the results supported suicidal thoughts were driven by camouflaging autistic traits (p.3644). The authors noted that an interesting area of camouflaging was that of assimilation. A subscale on assimilation supported an additional variance to thwarted belonging (p.3644).

A strength of this study was that the implications discovered could help further guide autism research and camouflaging and it could help aid in suicide prevention by understanding autistic traits and camouflaging. Limitations in this study included study participants who were all undergraduate female students who self-identified with camouflaging, not specifically members of the autism population who used camouflaging as a coping strategy in social settings (p.3645).

Bernadin, Lewis, Bell, and Kanne (2021) considered the experiences of camouflaging and the contributions to mental health. The authors questioned the role of sex, diagnosis, and camouflaging related to mental health needs (depression, anxiety, and stress) within adolescents with and without autism (p.3). The authors considered whether the levels of camouflaging predicted the levels of mental health and needs (p.3).

Participants for this study included 140 adolescents between the ages of 13-18, with 78 participants with autism (23 females, 55 males) and 62 non-autistic participants (35 females, 27 males) with similar groups mean ages (p.3).

Participants officially diagnosed between the ages of 13-18 years old with no diagnosis of intellectual disabilities were considered for this study. Non-autistic participants could not meet

diagnostic criteria for ASD or have an individualized education program (IEP), and needed to be between the ages of 13-18 (p.3).

Participants completed the following measures: the Subthreshold Autism Traits Questionnaire (SATQ), which measured autistic traits through the use of 24 items and 5 subscales (social interaction and enjoyment, expressive language, reading facial expressions, oddness, and rigidity) (p.4).

The Camouflaging Autistic Traits Questionnaire (CAT-Q), a 25-item questionnaire related to camouflaging behaviors was administered where participants rated each item on a Likert-scale (p.4).

The short-form Depression Anxiety Stress Scales (DASS-21), a 42-item measure used to assess internalizing symptomatology, measured general psychological distress. Participants also rate items on a Likert-scale. The DASS-21 has been shown to be appropriate for use with adolescents, including adolescents on the autism spectrum (p.4).

The results were analyzed and data showed the following: the overall CAT-Q showed that females with autism scored higher than their male autistic peers, and the non-autistic peers (females with autism $m=106.13$, males with autism $m=96.67$, non-autistic females $m=101.25$ and non-autistic males $m=94.67$). The SAT-Q showed similar response results ((females with autism $m=39.52$, males with autism $m=38.41$, non-autistic females $m=19.54$ and non-autistic males $m=22.85$). The data supports significant correlation for non-autistic individuals (p.5).

The DASS-21 demonstrated a connection between depression and anxiety, with camouflaging levels a higher predictor than sex or diagnosis. The authors found that camouflaging was negatively correlated with well-being for both participant groups, suggesting that camouflaging may be associated with both anxiety and depression, regardless of diagnosis.

The authors suggested this may be because camouflaging is more stressful for adolescent females than males (p.7).

The authors also noted that participants who reported high levels of camouflaging across all settings indicated the highest levels of stress. They also found that the level of camouflaging was a significant predictor of DASS-21 stress scores for females, but not males (p.8).

The limitations and implications noted in this study were that the authors did not collect a lot of demographic information, such as race/ ethnicity and socioeconomic status. This information could have improved prediction in models. They also noted that the intelligence quotient (IQ) sample was small, and all information gathered was self-reported, which may have inhibited results (p.8).

Implications of this study leaves important information for future research or within clinical application as camouflaging levels could be considered during assessment and treatment for both autistic and non-autistic adolescents with depression and/or anxiety (p.8).

CHAPTER III: DISCUSSION AND CONCLUSION

Summary of Literature

This literature review sought to answer the following questions: what gender differences exist in autism spectrum disorders? How do gender differences affect diagnosis? Does gender reflect differently in regards to social challenges for girls with autism? What is camouflaging and how does it reflect within the female autism phenotype? Are there mental health concerns from the utilization of camouflaging in social interactions? By answering these questions educators can not only help recognize differences within different genders of students with autism but also support any mental health needs that may arise from these social challenges from camouflaging.

This literature review gave insight to the comparative differences between the genders of those with an autism diagnosis. One area of difference was that of gender bias in the diagnostic process, due to male only research (Milner et al., 2019; Andersson, et al., 2012, Cridland et al., 2013, Dworzynski et al., 2012). Another area was that the average time between the first signs of autism and identification was also found to be longer for females than males (Beeger et al., 2012). Evidence also suggested that teachers demonstrated bias in identification, where primary educational staff were found more likely to identify autism in boys over girls and were more sensitive to the male phenotype (Whitlock et al., 2020). Consideration of behavioral characteristics regarding girls with higher levels of emotional and behavioral problems and lower levels of cognitive functioning had a higher diagnostic probability (Duvekot et al., 2016). Restrictive and repetitive behaviors (RRB) in girls were also found to be less likely a prediction of diagnosis, with boys being more likely to receive a diagnosis (Duvekot et al., 2016; Knutsen et al., 2018; Young et al., 2018). The results also indicated that lower-functioning females

demonstrated decreased numbers of repetitive interest/stereotyped behaviors in girls when compared to similar males (Knutsen et al., 2018; Young et al., 2018).

As autism is a social and communication disorder, a comparative difference between autistic males and females was also discovered in reciprocal conversations and other forms of communication (Andesson, et al., 2012; Milner et al., 2019; Lundstrom et al., 2019). Research supported the evidence that while all individuals with autism struggle with social skills, females displayed better social skills, but exhibited needs in areas such as initiating and maintaining relationships (Milner et al., 2019, Cridland et al., 2013, Head et al., 2014; Tierney et al. 2016). Some research suggested that females may have a distinct ASD profile in the area of social skills (Head et al., 2013).

In regards to overcoming social challenges related to autism, research suggests that females demonstrate a “camouflaging” technique to hide or cope with autistic traits and/or to be more like their neurotypical peers (Ratto et al., 2018; Tierney et al., 2016; Wood-Downie et al., 2020; Tubío-Fungueiriño et al., 2020; Schneid & Raz, 2020; Jorgenson et al., 2020; Cook, Ogden, & Winstone, 2018; Lai et al. 2017; Hull et al., 2020; Bernadin et al., 2021; Halsall et al., 2021). When in school, research found that females camouflaged less in resource rooms than in mainstream classrooms, and even less at home (Halsall et al. 2021). Research suggested that camouflaging was used in one of two ways; as a solution and as a problem (Cook, Ogden, & Winstone, 2018). Peer conflict was noted to be another difference in gender, where autistic girls were found to be more similar to neurotypical peers than autistic boys (Sedwick, Hill, & Pellicano, 2019). Camouflaging was also noted to increase in adolescence, rather than in younger females with autism. Adolescents with a better developed Theory of Mind (ToM) camouflaged more than those with limited ToM (Hull, et al., 2020). Camouflaging was also considered in the

context of social media. Females with autism displayed less camouflaging online than in person, with females still displaying higher levels of camouflaging over males with autism and their neurotypical peers (Jedrzejewska & Dewey, 2021).

Evidence suggested that camouflaging is linked to long-term implications for mental health in autistic girls. (Beck et al., 2020; Cassidy et al., 2019; Bernadin et al., 2021). Negative consequences, such as psychological distress, depression, anxiety, stress, suicide and suicide ideation, along reduced daily functioning were all discussed as an indirect result of camouflaging ((Beck et al., 2020; Cassidy et al., 2019; Bernadin et al., 2021).

Professional Application

Special education teachers know that early identification and intervention is key to learning for students with autism. Yet research indicates that girls are more likely to have a delayed autism diagnosis compared to their male peers. The evidence also shows that girls are more likely to camouflage or hide their autistic symptoms to fit in socially. Evidence further suggests that this could lead to mental health concerns and at-risk behaviors. Educators need to be made aware of this triad of concerns in regards to the female autism phenotype to help identify the gender specific differences in females with autism. Being aware and identifying camouflaging techniques demonstrated by girls with autism can also help support their social-emotional needs in school. This information can help educators better support mental health concerns that may arise from camouflaging and can prepare our students for transition to adulthood.

Limitations of Research

The research studies were limited in several ways. Regarding demographics, specifically small sample sizes limited results across a diverse population. Limitations also included a lack of

participant racial and socio-economic diversity, which was also not indicative of a true population. Other limitations included a bias to cis-gender participants, with very few studies including non-binary participants. These studies did not demonstrate the long-term effects of camouflaging for adult females with autism. Many studies included only one or two interviews and some participants had self-reported autism. Many of the studies were performed in European countries, which does not always reflect the life culturally for students in the United States. The vast amount of research studied did not include implications for students with autism in the classroom, which would have been beneficial to extend the research results into classrooms.

Implications for Future Research

The implications for mental health concerns from camouflaging are clear. Further research could be done not only on early identification for girls with autism, but also on what markers may exist regarding identifying camouflaging in girls with autism. There needs to be a better diagnostic tool designed for the female brain for accurate autism diagnosis. This would not only help identifying intervention strategies to help with social-emotional concerns, but also how to manage camouflaging strategies and better support girls' mental health concerns. Long term studies could be completed using a broader and more diverse sample, reflective of a diverse population. Nonbinary participants should also be included to determine specific differences in camouflaging and mental health. It would be interesting to see studies done with participants such as these throughout their educational career.

Conclusion

The guiding questions in the research for this literature review were: what are the major differences and similarities between males and females with autism, and why is there a large discrepancy in the diagnosis? Much of the research supported the idea that there is a significant

difference in diagnosis between the genders. Some imply that current diagnostic tools were created using the male brain and that any stereotypical autistic symptoms are from males with autism. However, the research indicates that the autism diagnosis is disproportionate in regards to females. The purpose of this literature review was to research this discrepancy and discover what other differences existed between the genders when discussing autism. The reviewed literature suggests that females are diagnosed with autism later than males, and even then, the numbers are disproportionate at a boy to girl ratio of 4:1. The literature indicates that while autism is a social/communication disorder, disparities exist between the genders, as research found that females with autism had better higher language skills, fewer restrictive and repetitive behaviors (RRBs), and fewer behaviors over males with autism. The research also indicated that females with autism are more likely to camouflage their autistic symptoms. This camouflaging may be due to coping strategies, fitting in socially, or the desire to be more like neurotypical peers. However, research suggests that camouflaging can have a serious impact on an individual's mental health. Negative consequences, such as psychological distress, depression, anxiety, stress, suicide and ideation of suicide, along reduced daily functioning were all discussed as an indirect result from camouflaging ((Beck et al., 2020; Cassidy et al., 2019; Bernadin et al., 2021). Continued research on a larger scale would improve the gender specific identification and diagnosis, identify specific needs and effective strategies to address camouflaging, and provide mental health supports in address autism needs in girls,

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