

LITERATURE REVIEW

Peer Interactions of School-Aged Girls on the Autism Spectrum: A Scoping Review[†]

Michelle Tso^{1*} , Iva Strnadová^{1,2,3} , Joanne Danker¹  and Sue O'Neill¹ 

¹UNSW Sydney, Australia, ²UNSW Disability Innovation Institute, Australia, and ³UNSW Gonski Institute for Education, Australia

*Corresponding author. Email: m.tso@unsw.edu.au

(Received 3 September 2022; revised 24 February 2023; accepted 25 February 2023; first published online 11 April 2023)

Abstract

Although research on the experiences of females on the autism spectrum is still developing, it is becoming increasingly apparent that their experiences are not comparable to their male counterparts. This scoping review aimed to collate research related to the peer interaction experiences of school-aged girls on the autism spectrum from their perspective. A database and journal search (2010–2020) found 21 studies. Key findings indicated that although school-aged girls on the autism spectrum generally desired friendship, they faced diverse peer interaction difficulties, including making and maintaining friendships, peer victimisation, and rejection. Given these challenges, appropriate peer interaction supports and further research into the complexities of their peer interaction experience is needed.

Keywords: scoping review; autism; peer relationships; friendship; gender; female

Autism refers to a neurodevelopmental condition, characterised by differences in communication and social interaction in conjunction with repetitive behaviours, activities, or interests and hyper- or hypo-sensory sensitivities (American Psychiatric Association, 2013). According to the United States Centers for Disease Control and Prevention, the prevalence of autism in children is 2.3% (Maenner et al., 2021). Similar prevalence rates of over 3% were reported among Australian children (Australian Bureau of Statistics, 2019). Although this prevalence of autism has created greater interest and research in the field, studies focusing specifically on gender differences and the experiences of females on the autism spectrum are still new and developing (Gould, 2017).

The male to female diagnosis ratio for autism has been reported to be between 4:1 to 3:1 (Baio et al., 2018; Loomes et al., 2017). Over the past decade, however, there has been increased recognition that females on the autism spectrum are more likely to be under-identified, misdiagnosed, or diagnosed later in life than males on the autism spectrum (Begeer et al., 2013; Loomes et al., 2017). These diagnostic-related issues appear to be because of differences in the presentation of autistic characteristics from males on the autism spectrum (Bargiela et al., 2016; Green et al., 2019). A variety of theories, including that of extreme male brain theory (Baron-Cohen, 2002) and female protective effect (Robinson et al., 2013), have sought to explain the differences between males and females on the autism spectrum, but there is no consensus currently.

Hiller et al.'s (2014) study with clinician and teacher diagnostic assessments and reports indicated that females on the autism spectrum were more able to engage in reciprocal conversation and had different restricted interests than those common with males. A summary of behavioural sex differences

[†]This manuscript was accepted under the Editorship of Michael Arthur-Kelly.

in Lai et al. (2015) also showed females had more awareness of social interaction needs and tendencies towards perfectionism. Another notable difference is that females on the autism spectrum appear to mask or camouflage their autism characteristics, such as social communication difficulties, more than males on the autism spectrum (Lai et al., 2017; Schuck et al., 2019). Although the terms masking and camouflaging are often used interchangeably, for simplicity we will only use the term masking in this review to refer to the complex behaviours of imitating others and concealing difficulties to meet environmental demands (Tubío-Fungueiriño et al., 2021).

Tubío-Fungueiriño et al.'s (2021) systematic review explored the effect of masking in females on the autism spectrum. It identified that they masked through mimicking other's behaviours, consciously developing their empathy skills, and exerting self-control. Tubío-Fungueiriño et al. proposed that masking could be connected to the social expectations of being a female and to better fit into social environments with reduced social rejection. It was also recognised that although masking served as an adaptive mechanism for females on the autism spectrum, there were substantial negative impacts, such as high anxiety and reduced self-esteem and wellbeing.

Peer Interactions of School-Aged Students on the Autism Spectrum

Peer interactions are critical to the development of children and adolescents, affecting their behavioural and affective wellbeing (Bukowski et al., 2018). Peers are also a source of social support for neurotypical children and adolescents, and successful peer interactions portend adult adaptive and social functioning (Picci & Scherf, 2015). For individuals on the autism spectrum, their social difficulties extend into their interactions with peers at school. School-aged students on the autism spectrum reported difficulties with friendships, including concerns around not knowing how to initiate friendships and how to converse with friends (Sumiya et al., 2018). They also encountered significant levels of victimisation and worries associated with victimisation (Ashburner et al., 2019; Sterzing et al., 2012). The importance of peer interactions for school-aged students on the autism spectrum is reflected in the attention given to skills for enhancing peer interactions within evidence-based social skills and peer-mediated interventions (Babb et al., 2021; Bene et al., 2014).

Children on the autism spectrum appeared to have fewer friends, less frequent contact with their friends, and shorter durations of friendship compared to their neurotypical peers (Petrina et al., 2014). Another finding in Petrina et al. (2014) was that children on the autism spectrum were less able to provide a comprehensive definition of friendship, although they did identify companionship, similar interests and personality, and mutual help as part of friendships. Cresswell et al.'s (2019) more recent review of peer interactions for adolescents on the autism spectrum underscored similar difficulties in describing friendship as a concept. Adolescents did, however, generally understand friendships and its important qualities. They also expressed a desire for friendship and were able to form and maintain friendships at school but encountered challenges in understanding social conventions, loneliness, and peer rejection.

Tomlinson et al.'s (2020) systematic review about the school experiences of girls on the autism spectrum found that they had a quality of friendship more similar to neurotypical girls than boys on the spectrum. They also often formed friendships with other girls on the autism spectrum and were more socially motivated than their male peers. It was also reported that girls on the autism spectrum found perspective taking and social expectations in friendships difficult. Moreover, girls on the autism spectrum faced relationally aggressive behaviours. These behaviours, which are defined as those that harm another's social relationships or social group inclusion, include exclusion and gossip, which was not experienced by boys on the autism spectrum (Kraft & Mayeux, 2018).

It increasingly appears that the experiences of girls on the autism spectrum are not comparable to that of boys (Hiller et al., 2014; Tubío-Fungueiriño et al., 2021). Considering the under-representation and under-studied nature of females on the autism spectrum (Lai et al., 2015; Watkins et al., 2014), it is particularly pivotal to hear from girls on the autism spectrum themselves rather than from other stakeholders, such as teachers or parents, in understanding their unique peer interaction experiences.

Previous reviews have investigated peer interactions of autistic adolescents using qualitative evidence (Cresswell et al., 2019) and the broader school experiences of girls on the autism spectrum (Tomlinson et al., 2020). In this scoping review, we intended to focus solely on the peer interactions of school-aged girls on the autism spectrum from their perspective through synthesising qualitative, quantitative, and mixed methods research. Consequently, the aim of this review was to explore the peer interactions of school-aged girls on the autism spectrum from their perspective. The research questions we sought to answer in this review are as follows:

1. What are the peer interaction experiences of school-aged girls on the autism spectrum?
2. How do the peer interaction experiences of school-aged girls on the autism spectrum compare to school-aged boys on the autism spectrum?
3. What peer interaction difficulties are experienced by school-aged girls on the spectrum?
4. What strategies did school-aged girls on the spectrum employ when experiencing peer interaction difficulties?

Methods

Search Strategy

A scoping review design was chosen to identify and collate research evidence (Arksey & O'Malley, 2005). The choice of a scoping review was based on its appropriateness in exploring emerging evidence of a broader scope as compared to that of a more specialised systematic review (Munn et al., 2018).

The complete search process can be viewed in Figure 1. The combination of search terms used to search the four databases was (Autis*) OR (Asperger*) OR (ASD) OR (ASC) AND (Girl*) OR (Female*) OR (Gender) AND (Mainstream) OR (General education) OR (Special school) AND (Peer*) OR (Friend*) OR (Relationship*) OR (Social*) OR (Bully*) OR (Interact*) OR (Lone*). A manual journal search was also conducted in four international peer-reviewed journals whose focus is developmental disabilities. Additionally, an ancestral search was performed on the full texts identified to be included in the review. The above searches were completed between January and July 2020.

To be included, studies had to have participants who were school-aged girls on the autism spectrum in kindergarten to Year 12. The perspectives of other stakeholders, such as family members, could be present; however, their data would not be extracted because of the study's aim to be solely from the perspective of girls on the autism spectrum. The participants had to have actively contributed to the data (e.g., interview, self-report surveys) and explicitly discussed their peer interactions. Studies that did not include the active participation of girls on the autism spectrum, such as observation-only studies, were excluded. Studies also had to be published between 2010 and 2020 and be peer-reviewed journal articles in English. The date range was chosen to begin from 2010, as research focusing on girls on the autism spectrum is a relatively new development.

Data Screening, Extraction, and Synthesis

A total of 314 records were identified through the database and manual journal search. After 124 duplicates were excluded, two authors independently screened the abstracts and then the full texts of each article. The interrater reliability measured by Cohen's kappa was $\kappa = 0.830$ for the abstract screening and $\kappa = 0.839$ for the full-text screening. A further 173 records were excluded through the abstract and full-text screening, with 17 articles meeting inclusion criteria from the database and manual journal search. Four additional articles were identified through ancestral searches and were agreed on by two authors for inclusion, with the interrater reliability being $\kappa = 0.642$ for the abstract screening and $\kappa = 0.75$ for the full-text screening. Thus, a total of 21 articles were included for analysis in this review.

The main characteristics of the studies — that is, location, participants, aim, study design and key findings — were then extracted. These characteristics are presented in Table 1. Inductive content

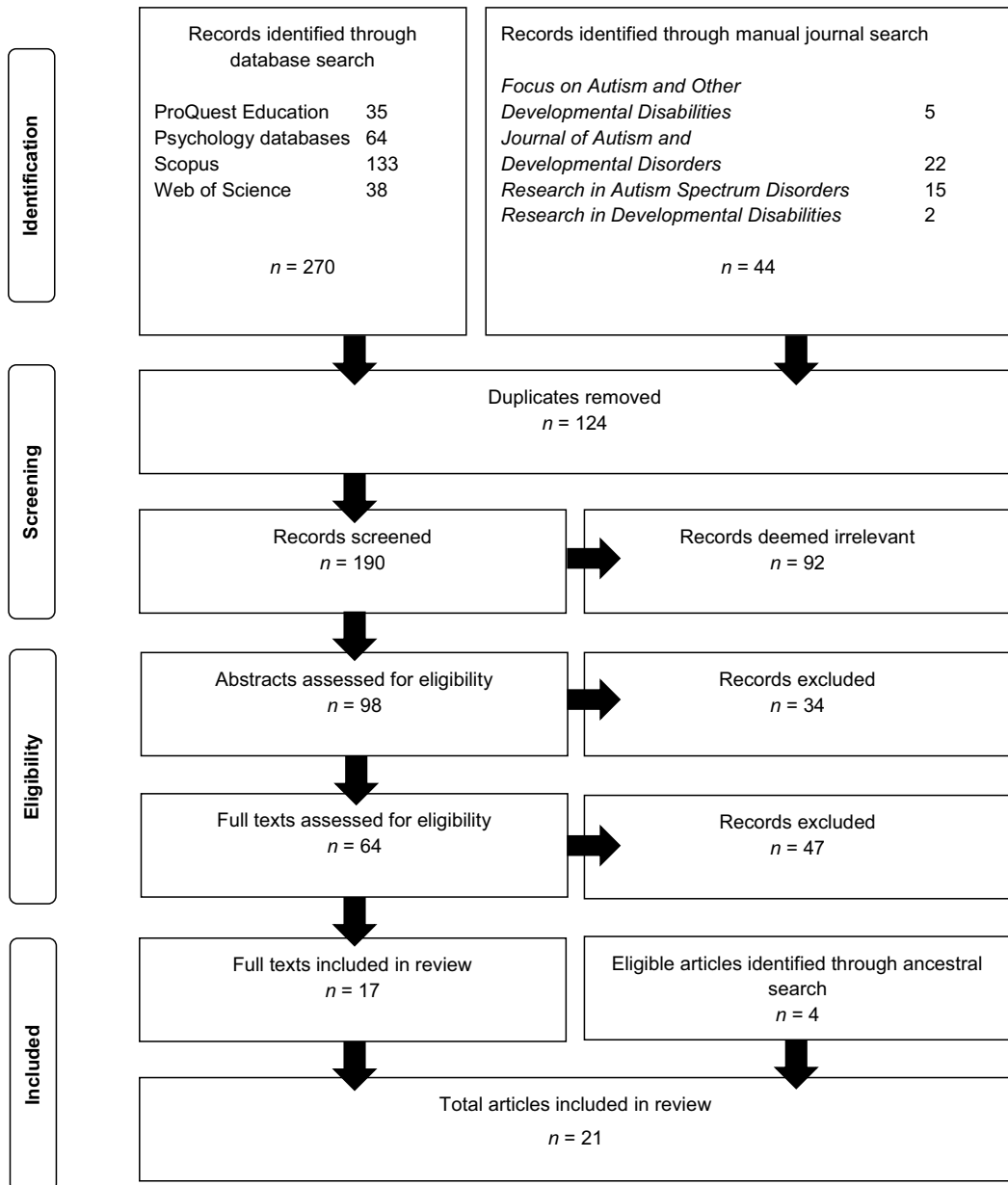


Figure 1. Flowchart of Search Process.

analysis was employed to systematically analyse the studies and describe the research phenomenon (Elo et al., 2014). In the preparation stage, the first author prepared the data by selecting data relevant to the research aim. Thereafter, they coded the data and organised the codes into categories, subthemes, and themes. As other participants, such as boys on the autism spectrum, or stakeholders, such as family members, could be present in the studies, care was taken to draw data exclusively from girls on the autism spectrum. In cases where data was aggregated or synthesised in a way that it was not clear whether it could be correctly attributed to a girl or girls on the autism spectrum, it was not included. The second author checked the extracted data and coded data respectively for accuracy and

Table 1. Study Characteristics

Study (authors' names, year)	Location (country)	Participants (No., diagnosis, age, gender, IQ where specified)	Aim	Study design (type, method/ measures)	Key findings	Quality assessment
Anderson et al. (2016)	United States	182 students on the autism spectrum (47 girls and 135 boys) and 152 neurotypical students (64 girls and 88 boys) aged 5–12 years. Average IQ of students on the autism spectrum was 92.31.	Recognise and compare predictors of social connectivity with students on the autism spectrum and neurotypical students	Quantitative: Friendship Survey	For students on the autism spectrum, gender and the size of their classroom showed a unique association with predicting social connectivity and connectivity change.	0.96
Bossaert et al. (2012)	Belgium	58 students on the autism spectrum (6 girls and 52 boys), 50 students with motor and/or sensory difficulties (18 girls and 32 boys) and 108 neurotypical students (26 girls and 82 boys) in Year 7	Examine the prevalence of loneliness in students on the autism spectrum, students with motor and/or sensory disabilities and neurotypical students. Second, to investigate the relationship between loneliness and friendship quantity, friendship quality and social self-concept and compare this relationship across the aforementioned groups of students.	Quantitative: sociometric nominations, friendship quality instrument, Social Description Questionnaire and Loneliness and Aloneness Scale for Children and Adolescents	In comparison to neurotypical students and students with motor and/or sensory disabilities, students on the autism spectrum reported greater loneliness. For students on the autism spectrum and students with motor and/or sensory disabilities, same-sex social concept had a connection with loneliness. For neurotypical students, opposite-sex social concept was related to loneliness.	1
Calder et al. (2013)	United Kingdom	12 children on the autism spectrum (4 girls and 8 boys) aged 9–11 years, 11 matched neurotypical students, 237 classroom peers, 11 mothers and 8 teachers. Average IQ of students on the autism spectrum was 95.17.	Examine the friendships of children on the autism spectrum from a multi-informant perspective	Mixed: Friendship Qualities Scale, Strange Stories Test, Social Cognitive Mapping exercise, structured observations and semistructured interviews	There was high variability in the friendship ratings of children on the autism spectrum. They rated their best friendships as lower in quality than their neurotypical peers. Nevertheless, they also reported satisfaction in them. There was also considerable consistency between the perspectives of children on the autism spectrum, their parents, and teachers on the nature of their friendships.	0.82

(Continued)

Table 1. (Continued)

Study (authors' names, year)	Location (country)	Participants (No., diagnosis, age, gender, IQ where specified)	Aim	Study design (type, method/ measures)	Key findings	Quality assessment
Cook et al. (2018)	United Kingdom	11 girls on the autism spectrum aged 11–17 years, with 10 mothers and 1 father	Consider the experiences of girls on the autism spectrum in regard to friendship, victimisation and learning from their and their parent's standpoint	Qualitative: semistructured interviews	Girls were motivated to have friends but faced difficulties, including victimisation and social isolation. The masking of their autistic traits was perceived to be both a solution and obstacle. Masking allowed girls to hide their differences but also meant that their learning and social difficulties were at risk of being missed.	0.8
Cridland et al. (2014)	Australia	3 girls on the autism spectrum aged 16–17 years, with their 3 mothers and 2 additional mothers	Examine the experiences of adolescent girls on the autism spectrum	Qualitative: semistructured interviews	Adolescent girls on the autism spectrum had some comparable experiences to adolescent boys on the autism spectrum, such as difficulties in transitioning to high school. They also had experiences distinctive to them, including challenges maintaining friendships with neurotypical peers.	0.95
Dean et al. (2014)	United States	50 students on the autism spectrum (25 girls and 25 boys) and 50 neurotypical students (25 girls and 25 boys) aged 6–10 years. Average IQ of girls on the autism spectrum was 90.72.	Explore the social relationships of students on the autism spectrum through the lens of gender	Quantitative: Friendship Survey	Both students on the autism spectrum and neurotypical students mainly socialised with friends of the same gender. Nevertheless, students on the autism spectrum had fewer peer relationships and nominations and greater social exclusion than neurotypical students. Moreover, boys on the autism spectrum were more socially excluded than girls on the autism spectrum.	1

(Continued)

Table 1. (Continued)

Study (authors' names, year)	Location (country)	Participants (No., diagnosis, age, gender, IQ where specified)	Aim	Study design (type, method/ measures)	Key findings	Quality assessment
Dillon et al. (2016)	United Kingdom	14 children on the autism spectrum (3 girls and 11 boys) and 14 matched neurotypical students with a mean age of 13 years	Explore the mainstream school experiences of students on the autism spectrum compared to neurotypical students	Mixed: Teenage Inventory of Social Skills, Quality of Student–Teacher Relationship Scale, Behavioral and Emotional Ratings Scale–Youth and semistructured interviews	Quantitative findings showed children on the autism spectrum and neurotypical children had similar school experiences. This was also supported by the qualitative findings, although they also showed some differences between the groups, such as their perceptions of peer support.	0.85
Fink et al. (2018)	Netherlands	120 children on the autism spectrum (11 girls and 109 boys) aged 11–20 years. Participants had average or above average IQ.	Investigate the relationship between peer-nominated bullying-related behaviours and characteristics such as age and autism severity for children on the autism spectrum	Quantitative: Bullying Role Nomination Procedure, Social Responsiveness Scale and Strengths and Difficulties Questionnaire	A relationship existed between victimisation and peer problems as well as between bullying and behavioural problems, although this decreased with age. These results are similar to research exploring these relationships in neurotypical children. The study also highlighted that autism severity was not a significant predictor of bullying-related behaviours.	0.95
Goodall & MacKenzie (2019)	United Kingdom	2 girls on the autism spectrum aged 16–17 years	Explore the educational experiences of adolescent girls on the autism spectrum in mainstream schools	Qualitative: semistructured interviews and participatory methods	Both girls expressed that being bullied was their greatest concern at school. They also noted that they did not feel included at school and found the school environment stressful.	0.8

(Continued)

Table 1. (Continued)

Study (authors' names, year)	Location (country)	Participants (No., diagnosis, age, gender, IQ where specified)	Aim	Study design (type, method/ measures)	Key findings	Quality assessment
Head et al. (2014)	Australia	50 children on the autism spectrum (25 girls and 25 boys) and 51 neurotypical children (25 girls and 26 boys) aged 10–16 years with their parents. Participants had IQ scores \geq 70.	Investigate the presentation of autism in girls through examining friendship quality and gender differences	Quantitative: Friendship Questionnaire	Girls on the autism spectrum and neurotypical girls recorded higher scores on the Friendship Questionnaire than boys. The scores of girls on the autism spectrum and neurotypical boys were similar. Children on the autism spectrum scored lower than neurotypical children irrespective of gender.	0.95
Hebron & Humphrey (2014)	United Kingdom	22 students on the autism spectrum (3 girls and 19 boys), 21 students with dyslexia (4 girls and 17 boys) and 25 neurotypical students (6 girls and 19 boys) aged 11–17 years	Report on the mental health profiles of students on the autism spectrum compared to students with dyslexia and neurotypical students as well as identify contributing factors to their mental health difficulties	Mixed: Beck Youth Inventories and semistructured interviews	Compared to students with dyslexia and neurotypical students, students on the autism spectrum reported greater anger and anxiety. Contributing factors to the mental health difficulties of students on the autism spectrum included changes to routine and challenges in social relationships.	1
Howard et al. (2019)	United Kingdom	11 students on the autism spectrum (1 girl and 10 boys) aged 7–14 years	Examine the school experiences of bilingual students on the autism spectrum from their perspective	Qualitative: semistructured interviews	There was substantial variation in the school experiences of bilingual students on the autism spectrum. Nevertheless, some similarities were found between the students, such as their classroom experiences in preferring collaborative work, enjoying arts or maths, and use of technology.	0.85

(Continued)

Table 1. (Continued)

Study (authors' names, year)	Location (country)	Participants (No., diagnosis, age, gender, IQ where specified)	Aim	Study design (type, method/ measures)	Key findings	Quality assessment
Hu et al. (2019)	Taiwan	219 adolescents on the autism spectrum (27 girls and 192 boys) aged 11–18 years, with 186 mothers and 33 fathers. Participants had IQ scores ≥ 80 .	Explore the rate of cyberbullying among adolescents on the autism spectrum through self- and parent report	Quantitative: Cyberbullying Experiences Questionnaire; Social Responsiveness Scale; Swanson, Nolan, and Pelham Version IV Scale; Center for Epidemiological Studies Depression Scale; Multidimensional Anxiety Scale for Children; and Kiddie Schedule for Affective Disorders and Schizophrenia	Compared to their parents, adolescents reported higher rates of being a victim or perpetrator of cyberbullying. There was a significant relationship between being a victim of cyberbullying and anxiety, depression, and suicidality. There was also a significant association between older age and more severe oppositional defiant disorder symptoms with being a victim or perpetrator of cyberbullying.	1
Hughes et al. (2013)	United States	6 students on the autism spectrum (3 girls and 3 boys) aged 16–18 years. Participants had IQ scores between 56 and 110.	Evaluate whether using communication books with verbal students on the autism spectrum to increase peer interaction was feasible in a mainstream high school environment and whether it would be accepted by neurotypical peers	Mixed: multiple baseline design with observation and social validation measures	Use of the communication books increased the conversational peer interactions of students on the autism spectrum and was perceived positively by neurotypical peers.	1
Kuo et al. (2013)	United States	91 adolescents on the autism spectrum (17 girls and 74 boys) aged 12–18 years, with 91 parents	Compare the perspectives of adolescents on the autism spectrum and their parents on the adolescent's friendships, including friendship characteristics. Additionally, to report on their activity patterns and gender differences related to those activity patterns.	Quantitative: activity reports, Social Communication Questionnaire and Friendship Qualities Scale	Adolescents and their parents agreed on friendship characteristics but differed in their perception of the quantity of the adolescent's friends. 50% of adolescents spent an average of 4 hours a day with their friends, with boys most frequently playing video games and girls most frequently having conversations.	1

(Continued)

Table 1. (Continued)

Study (authors' names, year)	Location (country)	Participants (No., diagnosis, age, gender, IQ where specified)	Aim	Study design (type, method/ measures)	Key findings	Quality assessment
Murphy et al. (2017)	United Kingdom	8 adolescents on the autism spectrum (2 girls and 6 boys) aged 13–16 years	Understand how interpersonal relationships are described by adolescents on the autism spectrum	Qualitative: semistructured interviews and personal construct theory techniques	Participants conveyed that family and friendships were a source of support, although they did acknowledge interacting with peers was complicated.	0.75
Myles et al. (2019)	United Kingdom	8 girls on the autism spectrum aged 12–17 years	Investigate the experiences of adolescent girls on the autism spectrum in mainstream schools in terms of their sense of belonging and social life	Qualitative: semistructured interviews	Adolescent girls reported that they perceived friendship and social inclusion as integral to belonging. They also shared their experiences of being on the social periphery, feeling devalued and facing difficulties in social interactions.	0.8
Sedgewick et al. (2016)	United Kingdom	23 students on the autism spectrum (13 girls and 10 boys) with 23 neurotypical students (13 girls and 10 boys) aged 12–16 years and their teachers. Average IQ of girls on the autism spectrum was 81.17.	Explore the gender differences between girls and boys on the autism spectrum and neurotypical girls and boys in relation to social motivation and experiences of friendship	Mixed: Friendship Qualities Scale, Social Responsiveness Scale and semistructured interviews	Comparable social motivation and friendship quality was reported by girls on the autism spectrum and neurotypical girls. In contrast, boys on the autism spectrum reported less social motivation and differing friendship quality to neurotypical boys, neurotypical girls and girls on the autism spectrum.	0.95
Sproston et al. (2017)	United Kingdom	8 girls on the autism spectrum aged 12–17 years with their 8 mothers and 1 father	Investigate the school exclusion experiences of girls on the autism spectrum	Qualitative: semistructured interviews	Both girls on the autism spectrum and their parents reported that issues with staff responses, tensions in relationships with school members, and unsuitable environments impacted the school experience.	0.9

(Continued)

Table 1. (Continued)

Study (authors' names, year)	Location (country)	Participants (No., diagnosis, age, gender, IQ where specified)	Aim	Study design (type, method/ measures)	Key findings	Quality assessment
Tierney et al. (2016)	United Kingdom	10 girls on the autism spectrum aged 13–16 years	Investigate how adolescent girls on the autism spectrum handle their social relationships, including whether they use management strategies	Qualitative: semistructured interviews	Girls revealed that having and maintaining social relationships was particularly challenging during adolescence and required them to mask their true feelings and imitate or act in social situations.	0.9
Vine Foggo & Webster (2017)	Australia	7 girls on the autism spectrum aged 13–17 years	Consider the viewpoints of adolescent girls on the autism spectrum towards their social experiences with other girls	Qualitative: semistructured interviews and written responses	Having friends was considered important to most girls, and they were able to recognise key characteristics of friends. However, they also reported challenges with peer conflict and socialising in group contexts.	0.95

Table 2. Theme and Subthemes

Theme and description	Subthemes
1. Friendship: Experiences and features related to relationships specifically identified as friendships	Interest in friendship
	Experiences of friendship
	Activities with friends
	Qualities of friendship
	Nature of friendship
	Making and maintaining friendship
	Friendship groups
	Support with friendship
2. Peer relationships: Experiences related to relationships with peers within schools apart from friendships	Experiences with peers
	Peer victimisation and rejection
	Classroom social connection
	Classroom activities
3. Understanding self: Experiences related to personal life and identity	Growing up
	Identity factors
	Masking

applicability to the research aim. The three main themes and 15 subthemes developed through the data analysis are displayed in Table 2.

Quality Assessment

A quality assessment of the included studies was also conducted using the Standard Quality Assessment Criteria for Evaluating Primary Research Papers From a Variety of Fields (Kmet et al., 2004). The studies were assessed independently by the first and the second authors, and the authors resolved all disagreements by discussion. Quality assessment scores were interpreted by comparing percentages in which the relevant criteria were met (McGarty & Melville, 2018), with scores < 55% interpreted as weak, 55%–75% as moderate, and > 75% as strong. Out of the 21 articles included, 20 were strong and one was moderate.

All studies had identifiable designs that were appropriate in answering the stated research questions and conclusions supported by relevant results. Data analysis procedures were clearly described for most of the studies (14) and partially for some (seven). For studies where the qualitative assessment score was used (10), verification procedures to establish credibility were stated in seven studies and researcher reflexivity was discussed in eight studies. For studies where the quantitative assessment score was used (11), all studies defined measures with minimal potential for measurement bias and reported appropriate variance estimates.

Findings

Study Characteristics

The included studies were conducted in the United Kingdom (11), United States (four), Australia (three), Netherlands (one), Taiwan (one) and Belgium (one). The majority of studies collected participant data in schools (13), although some were collected at home (six) or other private locations (two).

Studies differed in their design, with qualitative studies (nine) being more prevalent than quantitative studies (seven) or mixed methods studies (five).

Participant Characteristics

For simplicity, the term school-aged girls on the autism spectrum will hereafter be condensed to girls on the autism spectrum. Studies including girls and boys on the autism spectrum as participants (14) were more common than studies with girls on the autism spectrum only (seven). Participating girls all had a diagnosis of either autism spectrum disorder, autism, Asperger's syndrome or pervasive developmental disorder not otherwise specified, apart from one student who was unable to be officially diagnosed due to cost. Co-occurring diagnoses included attention-deficit/hyperactivity disorder, oppositional defiant disorder, anxiety, depression, obsessive-compulsive disorder, learning disability, intellectual disability, speech and language difficulties, global developmental delay, dyspraxia, auditory processing difficulty, visual impairment, epilepsy, facial tic disorder, scoliosis, and gastro-oesophageal reflux disease.

Less than half the studies included stakeholders such as teachers and parents (eight). In total, there were 236 girls on the autism spectrum (5–20 years) out of 2,112 total participants. Student participants were enrolled in mainstream primary schools (three); mainstream secondary schools (six); special schools (two); a variety of educational settings (eight), including pupil referral units, alternative provisions, support units, supported employment and open university; and home education or not specified (two).

Themes and Subthemes

Friendship

Interest in friendship. Girls on the autism spectrum showed a keen interest for friendship (Cook et al., 2018; Hughes et al., 2013; Sedgewick et al., 2016; Tierney et al., 2016). The participants in Tierney et al. (2016) expressed their intrinsic motivation for friendship, with one student sharing, 'I definitely couldn't be some kind of hermit' (p. 78). This is reinforced by the findings of Sedgewick et al. (2016), where girls on the autism spectrum had higher levels of social motivation than boys on the autism spectrum. They also described a desire for a greater number of friends (Hughes et al., 2013; Sedgewick et al., 2016).

Additionally, girls on the autism spectrum reported loneliness from unfulfilled longings for friendship (Goodall & MacKenzie, 2019; Myles et al., 2019; Tierney et al., 2016; Vine Foggo & Webster, 2017). The absence of friends created feelings of anxiety and depression (Goodall & MacKenzie, 2019) and made one feel 'as though the whole world is against you' (Vine Foggo & Webster, 2017, p. 78). These accounts of loneliness are supported by the work of Bossaert et al. (2012), which highlighted that girls on the autism spectrum reported greater levels of loneliness than boys on the autism spectrum.

Girls on the autism spectrum valued the belonging that came from friendship (Myles et al., 2019; Sproston et al., 2017; Vine Foggo & Webster, 2017). For the participants in Myles et al. (2019), friendship was also seen to be integral to their overall school experience in providing belonging and social security. The notion of friends as social security was similarly referenced by Murphy et al. (2017), wherein a student noted that having fewer friends could make one vulnerable to making enemies. Most participants in Vine Foggo and Webster (2017) stated it was critical to have friends and that the benefits of friendship included emotional support and contentment.

Despite an interest in friendship, some girls on the autism spectrum also expressed a preference to be alone sometimes (Goodall & MacKenzie, 2019; Hebron & Humphrey, 2014; Vine Foggo & Webster, 2017). They expressed pleasure in spending time on their own (Goodall & MacKenzie, 2019; Hebron & Humphrey, 2014) or needing solitude to de-stress (Vine Foggo & Webster, 2017). The student in Goodall and MacKenzie (2019) who enjoyed her solitude also ranked having friends as being least important to an enjoyable school life.

Experiences of friendship. A considerable number of girls on the autism spectrum reported having friends or best friends (Calder et al., 2013; Cook et al., 2018; Dean et al., 2014; Howard et al., 2019; Hughes et al., 2013; Murphy et al., 2017; Sedgewick et al., 2016; Sproston et al., 2017; Tierney et al., 2016; Vine Foggo & Webster, 2017). Some girls on the autism spectrum, however, had fewer friends or reciprocated friendships. Calder et al. (2013) found that the percentage of reciprocated friendship among primary school-aged girls on the autism spectrum varied considerably from 20% to 100%. Additionally, when compared to neurotypical girls, the primary school-aged girls on the autism spectrum in Dean et al. (2014) were less likely to be nominated as a friend or as a member of a group. A notable finding of Goodall and MacKenzie (2019) was that the two girls on the autism spectrum did not have friends and were unsure what constituted a friend.

From the findings of Sproston et al. (2017) and Myles et al. (2019), girls on the autism spectrum showed a preference for a small group of close friends. The girls on the autism spectrum in the study of Kuo et al. (2013) spent the most time with one friend of the same gender, followed by same-gender and mixed-gender friend groups. Cook et al. (2018) found that the friendships formed by girls on the autism spectrum in special and mainstream schools were frequently with other girls with special needs or on the social periphery. Choice of friends was also discussed in Tierney et al. (2016), where participants described befriending others who help support and look after them, as seen in 'there was something about them that was more like mothering' (p. 78).

Activities with friends. Conversations were a common activity engaged in by girls on the autism spectrum and their friends (Kuo et al., 2013; Sedgewick et al., 2016; Vine Foggo & Webster, 2017). The conversation topics mentioned by the participants included fashion, popular culture, boys, gossip and private information, including secrets (Sedgewick et al., 2016; Vine Foggo & Webster, 2017). In Kuo et al. (2013), girls on the autism spectrum ranked participating in physical activities with their friends, engaging in community excursions, hanging out, visiting, and doing outdoor activities after conversation. A similarly diverse range of activities appeared in the findings of Vine Foggo and Webster (2017), with participants enjoying sleepovers, shopping, and going to movies and parties with their friends. When asked about their favourite activities, however, girls on the autism spectrum specified solitary activities, including art, gaming, and being with animals.

Qualities of friendship. Girls on the autism spectrum identified a range of qualities they considered important for someone to be their friend (Murphy et al., 2017; Myles et al., 2019; Sedgewick et al., 2016; Vine Foggo & Webster, 2017). Companionship was a characteristic identified by the participants in Myles et al. (2019) and Sedgewick et al. (2016) and was associated with care, fun, and happiness. Acceptance in being able to be themselves and acceptance of autism were also important traits of friends (Myles et al., 2019; Vine Foggo & Webster, 2017). Trust was another common important quality and was typically linked with understanding (Murphy et al., 2017; Vine Foggo & Webster, 2017). Lastly, humour was considered important, with a participant stating, 'they have to be funny. Definitely' (Sedgewick et al., 2016, p. 1302; see also Murphy et al., 2017).

Nature of friendship. Research has typically compared the nature of the friendships of girls on the autism spectrum with boys on the autism spectrum and neurotypical girls (Head et al., 2014; Kuo et al., 2013; Sedgewick et al., 2016). Kuo et al. (2013) found that both girls and boys on the autism spectrum perceived greater levels of help and closeness from female friends than male friends. Greater differences between girls and boys on the autism spectrum were found in Head et al. (2014) and Sedgewick et al. (2016). In Head et al. (2014), girls on the autism spectrum scored higher on the Friendship Questionnaire, which measures friendship quality, understanding, and empathy, than boys on the autism spectrum but scored similarly to neurotypical boys. Friendship quality was also measured in Sedgewick et al., which showed that girls on the autism spectrum reported closer, more helpful, and more secure friendships than boys on the autism spectrum. The quality of their friendship was in fact similar to neurotypical girls regarding levels of companionship, help, closeness, and security, with the only exception being conflict.

Making and maintaining friendship. Substantial hardships were encountered by girls on the autism spectrum in their process of making and maintaining friends (Cridland et al., 2014; Hughes et al., 2013; Murphy et al., 2017; Sproston et al., 2017; Tierney et al., 2016; Vine Foggo & Webster, 2017). The hardships included difficulties socialising appropriately, misunderstandings in communication, struggling with disagreements and conflicts, and feeling stressed from socialising, thus withdrawing from friendships and risking the friendship weakening (Tierney et al., 2016; Vine Foggo & Webster, 2017). One girl described the communication challenges she faced being on the autism spectrum as like ‘talking to another person through an intercom machine . . . and somehow the wires get crossed and they get the wrong message’ (Tierney et al., 2016, p. 78). These difficulties in making and maintaining friends were related to feelings of anger, annoyance, anxiety, confusion, and exhaustion in girls on the autism spectrum (Hughes et al., 2013; Murphy et al., 2017; Sproston et al., 2017; Tierney et al., 2016). In Hughes et al. (2013), despite being able during pre-intervention to articulate actions to make friends and receiving an intervention using communication books, the participants still found meeting new people to be onerous. A participant in Cridland et al. (2014) also expressed the particular challenge of trying to make friends with neurotypical peers in ‘as soon as they hear that I have a disability they just won’t even listen to me’ (p. 1266).

Friendship groups. A number of studies reported on friendship groups, which were often characterised by volatility and difficulty (Cook et al., 2018; Myles et al., 2019; Tierney et al., 2016; Vine Foggo & Webster, 2017). The size of friendship groups was varied, with some participants preferring one friend or a small group, whereas other participants mentioned being a part of a group of around 100 friends (Myles et al., 2019; Tierney et al., 2016). Participants described challenges including conflict, disagreement, group communication, and social exclusion (Myles et al., 2019; Tierney et al., 2016; Vine Foggo & Webster, 2017). In Myles et al. (2019), this social exclusion arose from feeling ignored, unwelcome, or unable to participate in the group conversation and activities. Moreover, girls on the autism spectrum described leaving groups, joining new groups, as well as being deserted by friends if they could not fit into the friendship groups (Cook et al., 2018; Tierney et al., 2016).

Support with friendship. Girls on the autism spectrum received assistance from family and teachers in their friendships (Goodall & MacKenzie, 2019; Murphy et al., 2017; Tierney et al., 2016). Support from parents and siblings included helping to set up meetings with friends, providing practical advice, and modelling appropriate behaviour (Murphy et al., 2017; Tierney et al., 2016). In Goodall and MacKenzie (2019), a participant reported receiving help from their teacher to make friends, which was briefly successful, although ‘once that year ended they would stop playing with me’ (p. 508).

Peer relationships

Experiences with peers. Girls on the autism spectrum expressed various difficulties with interacting with their peers (Cook et al., 2018; Dillon et al., 2016; Myles et al., 2019; Sproston et al., 2017; Tierney et al., 2016). The participants in Dillon et al. (2016) perceived their peers to be distractions in the mainstream classroom. Girls on the autism spectrum in specialised settings, including pupil referral units and special schools, felt their peers misunderstood their attempts to form friendships and bullied them (Cook et al., 2018; Sproston et al., 2017). Feelings of insecurity were reported in Tierney et al. (2016), with a participant describing that ‘I feel like a mouse and everyone else is like a giant cat . . .’ due to peers’ better understanding social protocols (p. 77). Similarly, the girls on the autism spectrum in Myles et al. (2019) spoke about being nervous around peers owing to a limited understanding of what to do in social interactions, as well as insubstantial social skills and support.

Peer victimisation and rejection. Experiences of peer victimisation were common among girls on the autism spectrum (Cook et al., 2018; Cridland et al., 2014; Goodall & MacKenzie, 2019; Sedgewick et al., 2016; Sproston et al., 2017). The types of peer victimisation they encountered were physical, sexual, social, and verbal, including being sworn at, called names, backstabbed, punched, and having their lunch thrown around the room (Cook et al., 2018; Goodall & MacKenzie, 2019;

Sedgewick et al., 2016; Sproston et al., 2017). One girl shared how a group of boys ‘call me other names that they know I don’t like, like “Frankenstein” (Cook et al., 2018, p. 309). Hebron and Humphrey (2014) noted that the concept and purposes of peer victimisation were understood clearly by girls on the autism spectrum. Peer victimisation was also considered a top concern of those participants, which was echoed by the girls in Goodall and MacKenzie (2019). Cook et al. (2018) found that the peer victimisation faced by girls on the autism spectrum in mainstream and special settings was different, with the events occurring in special settings typically being due to other students’ special needs rather than being intentional.

Peer rejection was another significant issue faced by girls on the autism spectrum (Cook et al., 2018; Goodall & MacKenzie, 2019; Myles et al., 2019; Tierney et al., 2016). They shared experiences of being picked last in sport, not being invited to out-of-school activities or parties, not being listened to, underestimated, and infantilised (Cook et al., 2018; Myles et al., 2019). A finding from Dean et al. (2014) was that the primary school-aged boys on the autism spectrum were rejected more frequently than girls on the autism spectrum.

Fink et al. (2018) and Sproston et al. (2017) showed the diverse responses that girls on the autism spectrum had to bullies. The questionnaires of Fink et al. indicated the girls were more likely to provide help to victims of bullying and less likely to be passive bystanders than boys. Sproston et al. found that participants physically retaliated, withdrew, or modified their behaviour when experiencing bullying.

Classroom social connection. The social connections of girls on the autism spectrum were examined in two studies (Anderson et al., 2016; Calder et al., 2013). None of the primary school-aged girls on the autism spectrum were socially isolated in Calder et al. (2013); however, some were more socially involved in their classrooms than others. Anderson et al. (2016) found that girls on the autism spectrum in primary school formed more social connections to peers in classrooms with 21 students or more. This contrasted with boys on the autism spectrum, who had greater social connections in classrooms with 20 students or fewer.

Classroom activities. Working with peers in the classroom was generally considered by girls on the autism spectrum to be challenging. For the participants in Goodall and MacKenzie (2019), finding a peer to work with was embarrassing and intensified their feelings of loneliness as they typically could not find a partner. One participant described it thusly: ‘I felt so little having to stand there waiting to pair up with the teacher’ (Goodall & MacKenzie, 2019, p. 508). For others, working with peers was difficult due to communication issues and feeling unable to cope with group tasks (Tierney et al., 2016). There was only one exception in Dillon et al. (2016), with a girl on the autism spectrum stating that she enjoyed working in a group if it was small, comprised of people she knew and not noisy.

Understanding self

Growing up. Difficulties in peer relationships became more prominent as girls on the autism spectrum grew up (Cook et al., 2018; Tierney et al., 2016). The participants in Tierney et al. (2016) specifically pinpointed the primary to high school transition as the threshold at which the challenges with peers became more pronounced. This was due to changes to implicit social expectations and protocol that the girls were unable to understand and conform to. Divergent interests, expectations of friendships, and maturity were also identified by girls on the autism spectrum as other differences between them and their peers and as a source of friendship difficulties (Cook et al., 2018; Tierney et al., 2016; Vine Foggo & Webster, 2017).

Identity factors. Girls on the autism spectrum discussed how their autistic and gender identities impacted their relationship with peers. Participants in Goodall and MacKenzie (2019) and Hebron and Humphrey (2014) felt a sense of difference from their peers due to their autistic diagnosis but did not want to be treated differently. Indeed, one girl remarked that ‘I’m happy that they’re treating me like an ordinary schoolgirl’ (Hebron & Humphrey, 2014, p. 29). Their autistic identity was framed in a more negative light in Goodall and MacKenzie, with participants regarding their autism as leading

to judgement from peers and causing difficulties with social interactions. Both Cridland et al. (2014) and Tierney et al. (2016) found that girls on the autism spectrum thought boys were more approachable than girls due to having more similar interests. Additionally, the participants in Tierney et al. felt 'ungirly' in comparison to other girls, leading to the perception that the female social space was inaccessible to them.

Masking. Considering the peer interaction challenges they faced, many girls on the autism spectrum compensated by modifying their behaviour (Cook et al., 2018; Hebron & Humphrey, 2014; Murphy et al., 2017; Myles et al., 2019; Tierney et al., 2016). These modifications included changing their personality and adopting similar actions to their peers to better fit in (Cook et al., 2018; Myles et al., 2019). A participant in Cook et al. (2018) described her rationale as, 'I thought if I changed to be like my other friend, they'll listen to me, and they all did ...' (p. 310). Murphy et al. (2017) found that the behaviour modifications could vary depending on the level of friendship, with a girl on the autism spectrum expressing that she felt more comfortable being her true self with very close friends. The participants in Tierney et al. (2016) described using skills of empathising and observation to enhance their peer interactions and improve their ability to imitate their peers. One such observation technique was pretending to be engaged in reading while in actuality watching their peers. Girls on the autism spectrum also deliberately masked their feelings of anxiety and sadness by pretending to be neutral or happy in order to make friends or maintain their friendships.

These efforts to imitate peers and mask feelings contributed to feelings of exhaustion and depression as well as to self-harm. One girl on the autism spectrum shared that 'I was getting to the point where I actually couldn't control some urges that I had ... I was a bit suicidal' (Tierney et al., 2016, p. 79). A conscious concealment of emotions was also found in Hebron and Humphrey (2014), with anger and anxiety being the feelings most often suppressed. Participants were able to find relief, however, through revealing their true feelings.

Discussion

This is the first review to provide a synthesis of qualitative, quantitative, and mixed methods research conducted between 2010 and 2020 on the peer interaction experiences of school-aged girls on the autism spectrum from their perspective. The answers to the research questions follow.

1. What are the peer interaction experiences of school-aged girls on the autism spectrum?

The findings highlighted that girls on the autism spectrum wanted to have friends and preferred small groups of friends (Cook et al., 2018; Hughes et al., 2013; Sedgewick et al., 2016; Tierney et al., 2016). They also considered friendships to be critical in terms of emotional support and feelings of belonging (Myles et al., 2019; Sproston et al., 2017; Vine Foggo & Webster, 2017). This is consistent with the findings of the systematic review of peer relationship experiences of adolescents on the autism spectrum conducted by Cresswell et al. (2019), where the adolescents expressed their desire for peer relationships and belonging in society. Girls on the autism spectrum also reported feelings of loneliness due to unmet desires for friendship (Goodall & MacKenzie, 2019; Vine Foggo & Webster, 2017).

The findings on the importance and desire of friendships for girls on the autism spectrum challenge the longstanding assumption that people on the autism spectrum are less socially motivated than neurotypical people (Sedgewick et al., 2019). This underscores the importance of being informed by the under-recognised voices of girls on the autism spectrum themselves and not perpetuating incorrect stereotypes (Watkins et al., 2014). Relatedly, considering the value girls on the autism spectrum placed on friendship, educators can support their peer interaction preferences and interests such as by ensuring a small group of their friends are present across different classes (Myles et al., 2019; Sproston et al., 2017). The loneliness encountered by girls on the autism spectrum due to an unmet desire for friendship also requires attention, with research highlighting the association between loneliness and

social anxiety and depression in young adults on the spectrum (Schiltz et al., 2021). Social skills interventions that enable girls on the autism spectrum to further develop social skills and participate in more successful social interactions with peers could contribute to improved interactions and reduced loneliness (Schiltz et al., 2021; Zeedyk et al., 2016).

2. How do the peer interaction experiences of school-aged girls on the autism spectrum compare to school-aged boys on the autism spectrum?

A few notable differences between the peer interaction experiences of boys and girls on the autism spectrum became apparent through the review. Specifically, girls experienced loneliness when their desire to have friends was not met, and their levels of loneliness were also higher as compared to boys (Bossaert et al., 2012). This aligns with the conclusions drawn in the study by Lai et al. (2015), which indicated that females as opposed to males on the autism spectrum have a stronger need to interact with others and develop friendships with one or a few people. The nature of friendships experienced by girls and boys on the autism spectrum also appeared to be different. Girls had higher levels of friendship quality, understanding and empathy as compared to boys (Head et al., 2014). They also reported having closer, more helpful, and secure friendships than boys on the spectrum (Sedgewick et al., 2016). These differences may be due to the distinct ways that boys and girls on the spectrum interact. Kuo et al. (2013) found that although boys and girls on the autism spectrum had similar amounts of social interactions with peers, boys were more likely to engage in activities with friends (e.g., playing), whereas girls engaged in conversations and focused on emotional closeness. As such, girls may have greater opportunities to develop and maintain friendships characterised by empathy and of a higher quality as compared to boys (Sedgewick et al., 2019).

This scoping review adds to the growing body of evidence indicating gender differences in peer interaction experiences and friendship quality of girls on the autism spectrum. This highlights the need for future research to select gender-balanced samples and recognise the potential impact of gender when researching peer interaction experiences (Płatos & Pisula, 2021). There is also a need for educators to be informed about the differences between the peer interaction experiences of girls and boys on the autism spectrum to provide relevant supports. Educational training and policies should account for these gender differences to be more appropriate for the needs and preferences of girls on the autism spectrum.

3. What peer interaction difficulties are experienced by school-aged girls on the spectrum?

The difficulties experienced by the girls in their friendships included a varying percentage of reciprocated friendship (Calder et al., 2013). The most commonly experienced hardship was the process of making and maintaining friends (Cridland et al., 2014; Hughes et al., 2013; Murphy et al., 2017; Sproston et al., 2017; Tierney et al., 2016; Vine Foggo & Webster, 2017), caused by difficulties with understanding the social rules of peer engagement and misunderstandings in communication. In Cresswell et al.'s (2019) systematic review, making and maintaining friends was the most challenging for the adolescents on the spectrum, caused by not knowing how to approach others, difficulties in resolving conflict situations, or misunderstanding social conventions.

The most troubling finding of this scoping review is the continuing experience of peer victimisation and rejection, with victimisation being prevalent in its different types (physical, sexual, social, and verbal). This is consistent with Cresswell et al.'s (2019) findings, where adolescents on the autism spectrum shared similar experiences, with some blaming themselves or their autistic traits. According to the findings from an earlier study by Sterzing et al. (2012), adolescents on the autism spectrum face a much higher victimisation rate (46.3%) compared to their neurotypical peers (10.6%). The finding of this scoping review also aligns with Greenlee et al.'s (2020) findings where adolescents on the autism spectrum reported experiencing relational victimisation, which includes more subtle forms of victimisation such as gossiping and ignoring. However, Greenlee et al.'s study indicated that relational victimisation

was related more to challenges in social functioning (e.g., social cognition, awareness, communication) and restricted and repetitive behaviours in girls, but that for boys, relational victimisation was only associated with social communication impairments.

The findings of this scoping review have clear implications for supports. Given the prevalence of peer interaction challenges for girls on the autism spectrum, social skills interventions such as social skills training and peer-mediated instruction tailored for girls on the autism spectrum based on evidence-based practices should be developed (Wong et al., 2015). These interventions should target the specific difficulties articulated by girls, including maintaining friends into the high school years and friendship group conflicts, to improve their peer interaction experiences (Hughes et al., 2013; Myles et al., 2019; Tierney et al., 2016; Vine Foggo & Webster, 2017).

Although specific anti-bullying programs for students with disability are in their infancy, it is still necessary for schools to respond to the peer victimisation and rejection that girls on the autism spectrum experience (Winchell et al., 2018). Educators should be conscious that girls on the autism spectrum are at increased risk of peer victimisation and rejection and foster a culture of inclusion (Yellow Ladybugs & the Department of Education and Training Victoria, 2018). Participation in anti-stigma programs can also encourage peer acceptance for girls on the autism spectrum (Ranson & Byrne, 2014).

4. What strategies did school-aged girls on the spectrum employ when experiencing peer interaction difficulties?

The girls in the reviewed studies developed diverse approaches to overcome the challenges experienced in peer interactions. These included changing their personality to be like their peers and thus fit in (Cook et al., 2018; Myles et al., 2019), and masking their feelings of anxiety and depression in order to make and maintain friends (Hebron & Humphrey, 2014; Tierney et al., 2016). Pretending to be like others and thus masking their autistic traits to better fit in was also one of the common coping mechanisms for women on the autism spectrum in Bargiela et al.'s study (2016), in which the women also shared detailed strategies of 'pretending to be normal', such as imitating other people's accent or pretending to have an interest in television programs they did not care for (p. 3287). Similarly, participants in the Cresswell et al.'s (2019) systematic review shared examples of masking social difficulties they encounter by pretending to be socially competent and popular.

Educators should be aware that girls on the autism spectrum use masking as a coping strategy and appreciate the significant social demands that they experience. Educators can provide appropriate support such as giving opportunities for girls to de-stress from social interactions (Vine Foggo & Webster, 2017). This can be through providing breaks or safe spaces to be alone to recuperate from social anxiety or exertion (Goodall, 2018). Additionally, as masking is associated with mental health challenges such as anxiety and depression, greater research is needed to understand how to better support the mental health of girls on the autism spectrum (Mandy, 2019). In particular, research undertaken on adolescents who are at greater risk of mental health difficulties should be prioritised (Hebron & Humphrey, 2014).

Limitations

One limitation of this scoping review is external validity, as the included studies varied in sample size. There were no limitations posed by the authors in terms of regions included in this review; however, most studies were conducted in Western countries. There is an urgent need to explore the peer interactions of school-aged girls on the autism spectrum in non-Western countries to gain a better understanding of their experiences and any potential societal and cultural influences on them. Another limitation of this scoping review was including only peer-reviewed articles. In future reviews, including reporting from grey literature may be relevant and provide a more diverse and fuller understanding of the experiences of girls on the autism spectrum.

Conclusion

School-aged girls on the autism spectrum desired friendships but encountered challenges in making and maintaining friendships as well as victimisation and rejection. Their peer interaction experiences also appear to be divergent from boys on the autism spectrum, including the practice of masking. Further awareness of the specific needs and experiences of girls on the autism spectrum is necessary in research and schools in order to provide relevant peer interaction support critical to their development and wellbeing.

Author note. This work has been prepared from a doctoral dissertation, which will be submitted by the first author in fulfilment of the requirements for the Doctor of Philosophy at the University of New South Wales.

Funding. This work was supported by the Australian Government Research Training Program Scholarship.

References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- Anderson, A., Locke, J., Kretzmann, M., & Kasari, C. (2016). Social network analysis of children with autism spectrum disorder: Predictors of fragmentation and connectivity in elementary school classrooms. *Autism, 20*(6), 700–709. <https://doi.org/10.1177/1362361315603568>
- Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19–32. <https://doi.org/10.1080/1364557032000119616>
- Ashburner, J., Siggers, B., Campbell, M. A., Dillon-Wallace, J. A., Hwang, Y.-S., Carrington, S., & Bobir, N. (2019). How are students on the autism spectrum affected by bullying? Perspectives of students and parents. *Journal of Research in Special Educational Needs, 19*(1), 27–44. <https://doi.org/10.1111/1471-3802.12421>
- Australian Bureau of Statistics. (2019). *Disability, ageing and carers, Australia: Summary of findings*. <https://www.abs.gov.au/statistics/health/disability/disability-ageing-and-carers-australia-summary-findings/latest-release#autism-in-australia>
- Babb, S., Raulston, T. J., McNaughton, D., Lee, J.-Y., & Weintraub, R. (2021). The effects of social skill interventions for adolescents with autism: A meta-analysis. *Remedial and Special Education, 42*(5), 343–357. <https://doi.org/10.1177/0741932520956362>
- Baio, J., Wiggins, L., Christensen, D. L., Maenner, M. J., Daniels, J., Warren, Z., Kurzius-Spencer, M., Zahorodny, W., Rosenberg, C. R., White, T., Durkin, M. S., Imm, P., Nikolaou, L., Yeargin-Allsopp, M., Lee, L.-C., Harrington, R., Lopez, M., Fitzgerald, R. T., Hewitt, A., . . . & Dowling, N. F. (2018). Prevalence of autism spectrum disorder among children aged 8 years — Autism and Developmental Disabilities Monitoring Network, 11 sites, United States, 2014. *MMWR Surveillance Summaries, 67*(6), 1–23. <https://doi.org/10.15585/mmwr.ss6706a1>
- Bargiela, S., Steward, R., & Mandy, W. (2016). The experiences of late-diagnosed women with autism spectrum conditions: An investigation of the female autism phenotype. *Journal of Autism and Developmental Disorders, 46*(10), 3281–3294. <https://doi.org/10.1007/s10803-016-2872-8>
- Baron-Cohen, S. (2002). The extreme male brain theory of autism. *Trends in Cognitive Sciences, 6*(6), 248–254. [https://doi.org/10.1016/S1364-6613\(02\)01904-6](https://doi.org/10.1016/S1364-6613(02)01904-6)
- Begeer, S., Mandell, D., Wijnker-Holmes, B., Venderbosch, S., Rem, D., Stekelenburg, F., & Koot, H. M. (2013). Sex differences in the timing of identification among children and adults with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 43*(5), 1151–1156. <https://doi.org/10.1007/s10803-012-1656-z>
- Bene, K., Banda, D. R., & Brown, D. (2014). A meta-analysis of peer-mediated instructional arrangements and autism. *Review Journal of Autism and Developmental Disorders, 1*(2), 135–142. <https://doi.org/10.1007/s40489-014-0014-9>
- Bossaert, G., Colpin, H., Pijl, S. J., & Petry, K. (2012). Loneliness among students with special educational needs in mainstream seventh grade. *Research in Developmental Disabilities, 33*(6), 1888–1897. <https://doi.org/10.1016/j.ridd.2012.05.010>
- Bukowski, W. M., Laursen, B., & Rubin, K. H. (Eds.). (2018). *Handbook of peer interactions, relationships, and groups* (2nd ed.). The Guilford Press.
- Calder, L., Hill, V., & Pellicano, E. (2013). 'Sometimes I want to play by myself': Understanding what friendship means to children with autism in mainstream primary schools. *Autism, 17*(3), 296–316. <https://doi.org/10.1177/1362361312467866>
- Cook, A., Ogen, J., & Winstone, N. (2018). Friendship motivations, challenges and the role of masking for girls with autism in contrasting school settings. *European Journal of Special Needs Education, 33*(3), 302–315. <https://doi.org/10.1080/08856257.2017.1312797>
- Cresswell, L., Hinch, R., & Cage, E. (2019). The experiences of peer relationships amongst autistic adolescents: A systematic review of the qualitative evidence. *Research in Autism Spectrum Disorders, 61*, 45–60. <https://doi.org/10.1016/j.rasd.2019.01.003>

- Cridland, E. K., Jones, S. C., Caputi, P., & Magee, C. A. (2014). Being a girl in a boys' world: Investigating the experiences of girls with autism spectrum disorders during adolescence. *Journal of Autism and Developmental Disorders*, 44(6), 1261–1274. <https://doi.org/10.1007/s10803-013-1985-6>
- Dean, M., Kasari, C., Shih, W., Frankel, F., Whitney, R., Landa, R., Lord, C., Orlich, F., King, B., & Harwood, R. (2014). The peer relationships of girls with ASD at school: Comparison to boys and girls with and without ASD. *The Journal of Child Psychology and Psychiatry*, 55(11), 1218–1225. <https://doi.org/10.1111/jcpp.12242>
- Dillon, G. V., Underwood, J. D. M., & Freemantle, L. J. (2016). Autism and the U.K. secondary school experience. *Focus on Autism and Other Developmental Disabilities*, 31(3), 221–230. <https://doi.org/10.1177/1088357614539833>
- Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., & Kyngäs, H. (2014). Qualitative content analysis: A focus on trustworthiness. *SAGE Open*, 4(1), 1–10. <https://doi.org/10.1177/2158244014522633>
- Fink, E., Olthof, T., Goossens, F., van der Meijden, S., & Begeer, S. (2018). Bullying-related behaviour in adolescents with autism: Links with autism severity and emotional and behavioural problems. *Autism*, 22(6), 684–692. <https://doi.org/10.1177/1362361316686760>
- Goodall, C. (2018). 'I felt closed in and like I couldn't breathe': A qualitative study exploring the mainstream educational experiences of autistic young people. *Autism & Developmental Language Impairments*, 3, 1–16. <https://doi.org/10.1177/2396941518804407>
- Goodall, C., & MacKenzie, A. (2019). What about my voice? Autistic young girls' experiences of mainstream school. *European Journal of Special Needs Education*, 34(4), 499–513. <https://doi.org/10.1080/08856257.2018.1553138>
- Gould, J. (2017). Towards understanding the under-recognition of girls and women on the autism spectrum. *Autism*, 21(6), 703–705. <https://doi.org/10.1177/1362361317706174>
- Green, R. M., Travers, A. M., Howe, Y., & McDougale, C. J. (2019). Women and autism spectrum disorder: Diagnosis and implications for treatment of adolescents and adults. *Current Psychiatry Reports*, 21(4), Article 22. <https://doi.org/10.1007/s11920-019-1006-3>
- Greenlee, J. L., Winter, M. A., & Marcovici, I. A. (2020). Brief report: Gender differences in experiences of peer victimization among adolescents with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 50(10), 3790–3799. <https://doi.org/10.1007/s10803-020-04437-z>
- Head, A. M., McGillivray, J. A., & Stokes, M. A. (2014). Gender differences in emotionality and sociability in children with autism spectrum disorders. *Molecular Autism*, 5, Article 19. <https://doi.org/10.1186/2040-2392-5-19>
- Hebron, J., & Humphrey, N. (2014). Mental health difficulties among young people on the autistic spectrum in mainstream secondary schools: A comparative study. *Journal of Research in Special Educational Needs*, 14(1), 22–32. <https://doi.org/10.1111/j.1471-3802.2012.01246.x>
- Hiller, R. M., Young, R. L., & Weber, N. (2014). Sex differences in autism spectrum disorder based on DSM-5 criteria: Evidence from clinician and teacher reporting. *Journal of Abnormal Child Psychology*, 42(8), 1381–1393. <https://doi.org/10.1007/s10802-014-9881-x>
- Howard, K. B., Katsos, N., & Gibson, J. L. (2019). The school experiences of bilingual children on the autism spectrum: An interpretative phenomenological analysis. *Research in Developmental Disabilities*, 87, 9–20. <https://doi.org/10.1016/j.ridd.2019.01.008>
- Hu, H.-F., Liu, T.-L., Hsiao, R. C., Ni, H.-C., Liang, S. H.-Y., Lin, C.-F., Chan, H.-L., Hsieh, Y.-H., Wang, L.-J., Lee, M.-J., Chou, W.-J., & Yen, C.-F. (2019). Cyberbullying victimization and perpetration in adolescents with high-functioning autism spectrum disorder: Correlations with depression, anxiety, and suicidality. *Journal of Autism and Developmental Disorders*, 49(10), 4170–4180. <https://doi.org/10.1007/s10803-019-04060-7>
- Hughes, C., Bernstein, R. T., Kaplan, L. M., Reilly, C. M., Brigham, N. L., Cosgriff, J. C., & Boykin, M. P. (2013). Increasing conversational interactions between verbal high school students with autism and their peers without disabilities. *Focus on Autism and Other Developmental Disabilities*, 28(4), 241–254. <https://doi.org/10.1177/1088357613487019>
- Kmet, L. M., Lee, R. C., & Cook, L. S. (2004). *Standard Quality Assessment Criteria for Evaluating Primary Research Papers From a Variety of Fields*. Alberta Heritage Foundation for Medical Research. <https://www.ihe.ca/advanced-search/standard-quality-assessment-criteria-for-evaluating-primary-research-papers-from-a-variety-of-fields>
- Kraft, C., & Mayeux, L. (2018). Associations among friendship jealousy, peer status, and relational aggression in early adolescence. *The Journal of Early Adolescence*, 38(3), 385–407. <https://doi.org/10.1177/0272431616670992>
- Kuo, M. H., Orsmond, G. I., Cohn, E. S., & Coster, W. J. (2013). Friendship characteristics and activity patterns of adolescents with an autism spectrum disorder. *Autism*, 17(4), 481–500. <https://doi.org/10.1177/1362361311416380>
- Lai, M.-C., Lombardo, M. V., Auyeung, B., Chakrabarti, B., & Baron-Cohen, S. (2015). Sex/Gender differences and autism: Setting the scene for future research. *Journal of the American Academy of Child & Adolescent Psychiatry*, 54(1), 11–24. <https://doi.org/10.1016/j.jaac.2014.10.003>
- Lai, M.-C., Lombardo, M. V., Ruigrok, A. N. V., Chakrabarti, B., Auyeung, B., Szatmari, P., Happé, F., Baron-Cohen, S., & MRC AIMS Consortium. (2017). Quantifying and exploring camouflaging in men and women with autism. *Autism*, 21(6), 690–702. <https://doi.org/10.1177/1362361316671012>

- Loomes, R., Hull, L., & Mandy, W. P. L. (2017). What is the male-to-female ratio in autism spectrum disorder? A systematic review and meta-analysis. *Journal of the American Academy of Child & Adolescent Psychiatry*, 56(6), 466–474. <https://doi.org/10.1016/j.jaac.2017.03.013>
- Maenner, M. J., Shaw, K. A., Bakian, A. V., Bilder, D. A., Durkin, M. S., Esler, A., Furnier, S. M., Hallas, L., Hall-Lande, J., Hudson, A., Hughes, M. M., Patrick, M., Pierce, K., Poynter, J. N., Salinas, A., Shenouda, J., Vehorn, A., Warren, Z., Constantino, J. N., . . . & Cogswell, M. E. (2021). Prevalence and characteristics of autism spectrum disorder among children aged 8 years — Autism and Developmental Disabilities Monitoring Network, 11 sites, United States, 2018. *MMWR Surveillance Summaries*, 70(11), 1–16. <https://doi.org/10.15585/mmwr.ss7011a1>
- Mandy, W. (2019). Social camouflaging in autism: Is it time to lose the mask? *Autism*, 23(8), 1879–1881. <https://doi.org/10.1177/1362361319878559>
- McGarty, A. M., & Melville, C. A. (2018). Parental perceptions of facilitators and barriers to physical activity for children with intellectual disabilities: A mixed methods systematic review. *Research in Developmental Disabilities*, 73, 40–57. <https://doi.org/10.1016/j.ridd.2017.12.007>
- Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, 18, Article 143. <https://doi.org/10.1186/s12874-018-0611-x>
- Murphy, M., Burns, J., & Kilbey, E. (2017). Using personal construct methodology to explore relationships with adolescents with autism spectrum disorder. *Research in Developmental Disabilities*, 70, 22–32. <https://doi.org/10.1016/j.ridd.2017.08.006>
- Myles, O., Boyle, C., & Richards, A. (2019). The social experiences and sense of belonging in adolescent females with autism in mainstream school. *Educational & Child Psychology*, 36(4), 8–21. <https://doi.org/10.53841/bpsecp.2019.36.4.8>
- Petrina, N., Carter, M., & Stephenson, J. (2014). The nature of friendship in children with autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders*, 8(2), 111–126. <https://doi.org/10.1016/j.rasd.2013.10.016>
- Picci, G., & Scherf, K. S. (2015). A two-hit model of autism: Adolescence as the second hit. *Clinical Psychological Science*, 3(3), 349–371. <https://doi.org/10.1177/2167702614540646>
- Platos, M., & Pisula, E. (2021). Friendship understanding in males and females on the autism spectrum and their typically developing peers. *Research in Autism Spectrum Disorders*, 81, Article 101716. <https://doi.org/10.1016/j.rasd.2020.101716>
- Ranson, N. J., & Byrne, M. K. (2014). Promoting peer acceptance of females with higher-functioning autism in a mainstream education setting: A replication and extension of the effects of an autism anti-stigma program. *Journal of Autism and Developmental Disorders*, 44(11), 2778–2796. <https://doi.org/10.1007/s10803-014-2139-1>
- Robinson, E. B., Lichtenstein, P., Anckarsäter, H., Happé, F., & Ronald, A. (2013). Examining and interpreting the female protective effect against autistic behavior. *Proceedings of the National Academy of Sciences of the United States of America*, 110(13), 5258–5262. <https://doi.org/10.1073/pnas.1211070110>
- Schiltz, H. K., McVey, A. J., Dolan Wozniak, B., Haendel, A. D., Stanley, R., Arias, A., Gordon, N., & Van Hecke, A. V. (2021). The role of loneliness as a mediator between autism features and mental health among autistic young adults. *Autism*, 25(2), 545–555. <https://doi.org/10.1177/1362361320967789>
- Schuck, R. K., Flores, R. E., & Fung, L. K. (2019). Brief report: Sex/gender differences in symptomology and camouflaging in adults with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 49(6), 2597–2604. <https://doi.org/10.1007/s10803-019-03998-y>
- Sedgewick, F., Hill, V., & Pellicano, E. (2019). ‘It’s different for girls’: Gender differences in the friendships and conflict of autistic and neurotypical adolescents. *Autism*, 23(5), 1119–1132. <https://doi.org/10.1177/1362361318794930>
- Sedgewick, F., Hill, V., Yates, R., Pickering, L., & Pellicano, E. (2016). Gender differences in the social motivation and friendship experiences of autistic and non-autistic adolescents. *Journal of Autism and Developmental Disorders*, 46(4), 1297–1306. <https://doi.org/10.1007/s10803-015-2669-1>
- Sproston, K., Sedgewick, F., & Crane, L. (2017). Autistic girls and school exclusion: Perspectives of students and their parents. *Autism & Developmental Language Impairments*, 2, 1–14. <https://doi.org/10.1177/2396941517706172>
- Sterzing, P. R., Shattuck, P. T., Narendorf, S. C., Wagner, M., & Cooper, B. P. (2012). Bullying involvement and autism spectrum disorders: Prevalence and correlates of bullying involvement among adolescents with an autism spectrum disorder. *Archives of Pediatrics & Adolescent Medicine*, 166(11), 1058–1064. <https://doi.org/10.1001/archpediatrics.2012.790>
- Sumiya, M., Igarashi, K., & Miyahara, M. (2018). Emotions surrounding friendships of adolescents with autism spectrum disorder in Japan: A qualitative interview study. *PLoS ONE*, 13(2), Article e0191538. <https://doi.org/10.1371/journal.pone.0191538>
- Tierney, S., Burns, J., & Kilbey, E. (2016). Looking behind the mask: Social coping strategies of girls on the autistic spectrum. *Research in Autism Spectrum Disorders*, 23, 73–83. <https://doi.org/10.1016/j.rasd.2015.11.013>
- Tomlinson, C., Bond, C., & Hebron, J. (2020). The school experiences of autistic girls and adolescents: A systematic review. *European Journal of Special Needs Education*, 35(2), 203–219. <https://doi.org/10.1080/08856257.2019.1643154>

- Tubío-Funqueiriño, M., Cruz, S., Sampaio, A., Carracedo, A., & Fernández-Prieto, M. (2021). Social camouflaging in females with autism spectrum disorder: A systematic review. *Journal of Autism and Developmental Disorders*, 51(7), 2190–2199. <https://doi.org/10.1007/s10803-020-04695-x>
- Vine Foggo, R. S., & Webster, A. A. (2017). Understanding the social experiences of adolescent females on the autism spectrum. *Research in Autism Spectrum Disorders*, 35, 74–85. <https://doi.org/10.1016/j.rasd.2016.11.006>
- Watkins, E. E., Zimmermann, Z. J., & Poling, A. (2014). The gender of participants in published research involving people with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 8(2), 143–146. <https://doi.org/10.1016/j.rasd.2013.10.010>
- Winchell, B. N., Sreckovic, M. A., & Schultz, T. R. (2018). Preventing bullying and promoting friendship for students with ASD: Looking back to move forward. *Education and Training in Autism and Developmental Disabilities*, 53(3), 243–252. <https://www.proquest.com/scholarly-journals/preventing-bullying-promoting-friendship-students/docview/2175248973/se-2>
- Wong, C., Odom, S. L., Hume, K. A., Cox, A. W., Fetting, A., Kucharczyk, S., Brock, M. E., Plavnick, J. B., Fleury, V. P. & Schultz, T. R. (2015). Evidence-based practices for children, youth, and young adults with autism spectrum disorder: A comprehensive review. *Journal of Autism and Developmental Disorders*, 45(7), 1951–1966. <https://doi.org/10.1007/s10803-014-2351-z>
- Yellow Ladybugs & the Department of Education and Training Victoria. (2018). *Spotlight on girls with autism*. Yellow Ladybugs. <https://yellowladybugs.com.au/School/Download>
- Zeedyk, S. M., Cohen, S. R., Eisenhower, A., & Blacher, J. (2016). Perceived social competence and loneliness among young children with ASD: Child, parent and teacher reports. *Journal of Autism and Developmental Disorders*, 46(2), 436–449. <https://doi.org/10.1007/s10803-015-2575-6>

Cite this article: Tso, M., Strnadová, I., Danker, J., & O’Neill, S. (2023). Peer interactions of school-aged girls on the autism spectrum: A scoping review. *Australasian Journal of Special and Inclusive Education* 47, 40–62. <https://doi.org/10.1017/jsi.2023.2>