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Mothers and fathers' perception of social-responsive behaviors of autistic individuals

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ABSTRACT

Background: The interplay between behavioral differences presented by autistic males and females, and gender norms might influence caregivers' behavior perceptions, contributing to the later identification of autistic females.

Aim: Our study aims to investigate differences in mothers' and fathers' perceptions of children's behaviors typically associated with autism. Further, we aim to analyze parental perception of children's behaviors in relation to their offspring's sex.

Second, our objective is to examine differences in the perception of behaviors of males and females to better understand females' phenotypes and potential reasons for their underdiagnosis

Methods: The sample consisted of 40 children and adolescents (*M* chronological age = 8.75 years, SD = 1.10, Range = 4–16.75), 20 males and 20 females, with their mothers and fathers. Parental perceptions are studied through the *Social Responsiveness Scale*, a quantitative report instrument that assesses autistic characteristics.

Results: Mothers and fathers reported similar profiles of their children. However, females presented better abilities in relation to Social Communication and fewer Mannerisms than males. However, clinicians' observations scores related to the ADOS-2 did not show evidence of differences in behavioural characteristics typically associated with autism.

Conclusions: These mechanisms should be further explored as they might partly determine females' later diagnosis. Children's age plays a significant role, as older individuals present more severe behaviors associated with autism in the dimensions previously mentioned and Social Motivation. Hence, a late diagnosis can exacerbate behavioral presentation of autism.

What this paper adds

This study examines the interplay between behavioral differences based on participants' sex and parental perceptions of their autistic children's behaviors.

Our research addresses a critical gap in the literature, as previous studies have not systematically explored potential differences between mothers' and fathers' perceptions. Notably, we found differences in Social Communication evaluations made by parents but not by clinicians who observed participants' behaviors during the administration of the ADOS-2, which may help explain mechanisms contributing to the delayed recognition of autistic females.

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1. Introduction

Since initial reports, autism has predominantly been associated with males, resulting in research characterized by female exclusion and the underdiagnosis and misdiagnosis of autistic girls. This male-centered view has shaped parental perceptions, contributing to delayed recognition of autism-related behaviors in females (Navot et al., 2017; Watson, 2014).

1.1. Autism characteristics in females

Considering The DSM-5 TR criteria, autistic individuals present peculiarities in the socio-communicative area, with specific reference to reciprocity during the interaction and communicative abilities, including the use of non-verbal communicative behaviors, and understanding of social interaction and relationships. These differences also translate into difficulties in the initiation and development of relationships with others (American Psychiatric Association APA, 2013). Despite presenting difficulties in the same areas, autistic females seem to present behavioral differences, adopting more sophisticated behaviors compared to males, which influences parental perception (Hull et al., 2020; Wood-Downie et al., 2021). A recent meta-analysis showed that females tend to display better social interaction and socio-communicative abilities. These differences seem to emerge when using fine-grained measures. In contrast, broader tools, such as the golden standard instrument for the diagnosis of Autism, often report similar profiles between males and females (Wood-Downie et al., 2021). Thus, while the golden standard instrument is helpful in diagnostic assessment, a fine-grained understanding of socio-communicative abilities in females can disclose the "whys" of late recognition of females. As a result, females are often diagnosed late in life (Chellew et al., 2022), with a recent study suggesting that among the roadblocks to the diagnosis of females, there is the age of pre-diagnosis and recognition of early signs (Hamdani et al., 2023). Among the studies suggesting sex as a crucial variable in reaching an early diagnosis, authors showed that despite not presenting differences in the age of first concern, males were diagnosed significantly earlier (McDonnell et al., 2021).

Importance should also be given to the second criterion for the diagnosis of autism: the presence of restricted and repetitive behaviors and interests. Specifically, no differences emerge from a quantitative point of view but from a qualitative one (Sutherland et al., 2017). A recent study using a fine-grained analysis revealed that females might also exhibit quantitative differences, displaying fewer restricted and repetitive behaviors but higher levels of compulsive and sameness behaviors (McFayden et al., 2020). Altogether, these findings suggest that current instruments employed in the diagnosis of autism lack specificity in the identification of these behaviors in females (Allely, 2019).

Consideration should also be given to *camouflage behaviors* - both conscious and unconscious strategies that females employ to mask their difficulties and the behaviors associated with autism to avoid social exclusion,which might contribute to a different perception of females' difficulties (Hull et al., 2017; Lai et al., 2015).

1.2. Caregivers' perceptions

The interplay between these differences and gender norms might influence the recognition of autism in females (Hutson & Hutson, 2023). Specifically, researchers suggested that the same behavior can be interpreted differently depending on whether it is exhibited by males or females; for instance, being quiet is often perceived as more acceptable when displayed by females (Bargiela et al., 2016). Additionally, parents often perceive autism as primarily a male condition (Navot et al., 2017). Understanding caregivers' perceptions is fundamental, as they are the primary interaction partners throughout child development. Caregivers' perceptions have been shown to be crucial as screening procedure than can later lead to the diagnosis (Aldridge et al., 2012). Further, their insights provide a deeper understanding of everyday functioning outside the clinical setting, complementing observations obtained through formal assessment tools (Bitsika & Sharpley, 2019). Research has demonstrated that parental perceptions of children's symptomatology are linked to caregivers' interactive behaviors, with these perceptions correlating to shorter engagement times (Kasari & Sigman, 1997) and with parental stress (Kissel & Nelson, 2016). Additionally, evidence suggests that the child's sex may influence caregivers' perceptions of autism-related behaviors, with male children receiving higher ratings on perceived severity. However, this effect was relatively small compared to other factors, such as the child's age and behavioral challenges (Hus et al., 2013). A study using vignettes depicting children in various life scenarios, with manipulations of sex and autism-related behavioral severity, found that parental concerns were similar for 5-year-old children regardless of sex. However, differences emerged when predicting future atypicality at age 15, with female children being perceived as more likely to exhibit normative behaviors (Geelhand et al., 2019). Considering studies on caregivers' perception results are inconsistent, as research is mainly focused on mothers, while fathers are systematically disregarded. Moreover, children sex differences are not generally analyzed (Bitsika & Sharpley, 2019; Navot et al., 2017; Rodgers et al., 2019)

1.3. The current study

The general objective of our study is to investigate differences in caregivers' perceptions of children's behaviors related to autism and analyze their perceptions in relation to their offspring's sex differences.

The first aim is to explore potential differences in mothers' and fathers' perceptions through the scores of a caregiver report measure, hence, the current study presents the novelty of administering the instrument to both caregivers for each participant.

Our second objective is to examine differences in the perception of behaviors of males and females to better understand females' phenotypes and potential reasons for their underdiagnosis. Previous studies mainly focus on sex differences investigated from a clinical point of view through golden standard instruments administered by psychologists, such as the Autism Diagnostic Observation

Schedule-2. In our study, we measure autism characteristics using the Social Responsiveness Scale (SRS), an instrument extensively used across research and clinical contexts, which proved to present adequate discriminant power when it is used to identify autistic individuals compared to other conditions based on caregivers perception (Bölte et al., 2008; Charman et al., 2007).

2. Methods

2.1. Participants

The sample consisted of 40 children and adolescents (*M* chronological age= 8.75 years, SD = 1.10, Range = 4 – 16.75), 20 males (*M* chronological age = 8.21, SD = 19.15, Range = 4–13) and 20 females (*M* chronological age = 9.37, SD = 28.86, Range = 4 – 16.75), with their mothers (*M* age = 43.27, SD = 6.35, Range = 30 – 55) and fathers (*M* age = 45.65, SD = 5.70, Range = 32 – 60). Both parents lived with their children and shared caregiving responsibilities.

Information about families' socio-economic status was collected and an index was computed based on the four-factor index of social status developed by Hollingshead (2011) which accounts for education and years of schooling, occupation, sex, and marital status. The score ranges from 8 to 66. Overall families' socio-economic status falls in the middle range (*M* = 40.01, *SD* = 13.97), also mothers' (*M* = 38.75, *SD* = 17.81) and fathers' (*M* = 41.40, *SD* = 15.45) socio-economic status separately fall within this range.

All children and adolescent participants met the diagnostic criteria for Autism, defined following the Diagnostic and Statistical Manual of Mental Disorders - 5 TR version (American Psychiatric Association, 2022). Males and females were matched based on age t (38) = -0.95, *p* = .35, *g*= *-0.29)* and the Developmental Quotient or the Intelligence Quotient, respectively, measured with the Griffith Mental Development Scales – Extended Revised (GMDS-ER) (Griffiths & Huntley, 1196) and the Wechsler Intelligence Scales for Children - 4 adapted for the Italian population (WISC-4; Orsini et al., 2012) depending on the individual's age. However, since the GMDS and WISC-IV overlap in the age range of 6–8 years, clinical judgment was used to select the appropriate assessment based on the child's individual characteristics. When parents requested a clinical evaluation and reported greater difficulties in communication and adaptive functioning, the developmental scales were preferred over the intelligence test. N = 20 individuals, 10 males and 10 females, were administered the Griffith Mental Development Scales – Extended Revised (GMDS-ER) and N = 20 individuals, 10 males and 10 females, the Wechsler Intelligence Scales for Children - 4 (WISC-4). Autism related behaviors were measured using the Autism Diagnostic Observation Schedule-2 a gold standard instrument employed in the diagnosis of autism. Mannerisms is an item assessed across all ADOS-2 modules, and it has been considered as these behaviors are also evaluated in the Social Responsiveness Questionnaire.

The inclusion criteria were:

i. A diagnosis of Autism based on the Diagnostic and Statistical Manual of Mental Disorders – 5 version criteria through clinical judgment by a licensed psychologist through behavioral observation and the administration of assessment instruments to evaluate autism-related behaviours.
ii. The individual attended a cognitive evaluation with instruments meant to assess developmental and cognitive profiles
iii. Chronological age was between 4 years and 16 years and 11 months

Participants have been excluded based on the following criteria:

i. A confirmed comorbid diagnosis.
ii. One of the caregivers did not complete the Social Responsiveness Scale.

See Table 1 for the score obtained in the cognitive measures and Table 2 for the scores related to autism characteristics.

Table 1
Clinical measures scores. Developmental Quotients (DQ), Intelligence Quotient and cognitive domains quotients.

				Females			Males			*t*(18)	*p*	Hedges's *g*
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*			
General DQ -GMDS-ER	20	66.50	25.48	10	67.00	30.58	10	66.00	21.73	0.08	.93	0.04
Mental Age -GMDS-ER	20	47.45	17.38	10	52.20	21.20	10	42.70	12.31	1.23	.24	0.55
Locomotor DQ -GMDS-ER	20	69.25	20.732	10	72.50	26.22	10	66.00	14.85	0.68	.51	0.31
Personal-Social DQ -GMDS-ER	20	64.60	21.743	10	68.10	29.56	10	61.10	11.10	0.70	.50	0.32
Language DQ -GMDS-ER	20	66.85	35.034	10	72.00	40.97	10	61.70	30.37	0.64	.53	0.29
Eye-hand coordination DQ -GMDS-ER	20	66.50	28.477	10	66.10	31.02	10	66.90	28.18	−0.60	.95	−0.03
Performance DQ -GMDS-ER	20	70.60	27.162	10	65.70	30.34	10	75.50	24.99	−0.79	.44	−0.36
Intelligence Quotient -WISC-IV	20	107.58	14.08	10	107.33	16.20	10	107.80	13.29	- 0.07	.95	−0.03
Verbal Comprehension Index - WISC-IV	20	105.60	24.33	10	99.40	30.04	10	111.80	17.17	−1.13	.27	−0.49
Visual Spatial Index - WISC-IV	20	113.55	16.06	10	110.30	18.69	10	116.80	13.63	−0.89	.39	−0.38
Working Memory Index - WISC-IV	20	96.70	17.92	10	93.40	16.96	10	100.00	19.60	−0.81	.43	−0.35
Processing Speed Index - WISC-IV	20	91.60	18.37	10	95.80	22.06	10	87.40	14.32	1.01	.33	0.43

2.2. Measures

2.2.1. Social Responsiveness Scale (SRS)

The Social Responsiveness Scale (Constantino et al., 2004) is a quantitative reporting instrument that assesses autistic characteristics in 4–18 year-olds used both as a screening instrument and a tool to corroborate the diagnosis, and it is administered to caregivers. The report evaluates 65 items related to the past six months, on a 0–3 Likert scale, corresponding to "not true" to "almost always true". It can be completed by a parent, caregiver, or educator. The instrument evaluates five domains: Social Awareness, Social Cognition, Social Communication, Social Motivation, and Mannerisms. Moreover, a total score is calculated, and it allows the evaluation of the severity of behaviors in the social sphere. *Social Awareness* refers to the ability to detect social signals from others, while *Social Cognition* refers to the interpretation of these. *Social Communication* assesses the expressive communicative behaviors and *Social Motivation* the interest of the subject in interacting with others. Concluding, the scale of *Mannerism* evaluates the repetitive behaviors and restricted interests. Raw scores can be converted into T-scores (M = 50, SD = 10). T-scores can be interpreted as ≤ 59, reflecting scores within normal limits; 60–65 T-scores fall into the mild range; 66–75 T-scores identify moderate severity; while scores above 76 fall into the severe range. T-scores are corrected for sex differences, therefore, using raw scores is recommended when exploring sex differences in research (Constantino & Gruber, 2012; Rodgers et al., 2019). However, in line with previous research conducted using this instrument we also considered T-scores to adopt a more comprehensive approach.

2.2.2. Autism Diagnostic Observation Schedule-2 (ADOS-2)

The Autism Diagnostic Observation Schedule-2 (ADOS-2; Lord et al., 2012) is a semi-structured observation instrument, considered a golden standard tool for the diagnosis of autism. It evaluates the two main areas of difficulties defined in the DSM-5 criteria (American Psychiatric Association [APA], 2013): Social Affect (SA) and Restricted, Repetitive Behaviors (RRBs).

ADOS-2 is constituted of five modules, depending on individuals chronological age (starting from 12 months) and level of expressive language. For the purposes of this study, all the modules were used, however, the instrument was not administered in one case as it had been recently conducted by other professionals during a concomitant diagnostic assessment. The scores from this prior assessment were ultimately considered to confirm the diagnosis, along with clinical observations, provided the participant met all inclusion criteria.For each module, SA and RRBs scores can be calculated by summing the item scores as specified by the algorithm. Further, the combined total of these two scores determines the classification within the Autism-Autism Spectrum–non spectrum continuum, with higher scores identifying a greater presence of symptoms. Then, the Total score can be converted to determine the severity of the autism characteristics in the mild-moderate-severe range. Differently from the other modules, Module 4, which was

Table 2
Scores related to the evaluation of autism characteristics using the ADOS-2.

ADOS-2	Females			Males			*t*	*p*	Hedges's *g*
	n	*M*	*SD*	*n*	*M*	*SD*			
Social Affect	14	9.36	3.77	14	10.00	3.84	0.45	.66	0.17
Restricted Repetitive Behaviors	14	2.64	1.39	14	4.07	2.53	1.85	.08	0.70
Total Score	14	12.00	4.11	14	14.07	5.36	1.15	.26	0.42
Comparison Score	14	5.50	1.56	14	6.43	1.65	1.53	.14	0.56
Communication – Module 4	5	2.60	1.14	6	2.50	0.55	−0.19	.85	−0.11
Reciprocal Social Interaction – Module 4	5	4.80	1.48	6	6.50	1.05	2.23	.05	1.23
Stereotyped behaviors – Module 4	5	0.20	0.45	6	0.83	0.75	1.65	.13	0.91
Mannerisms	19	0.68	0.89	20	0.85	0.99	0.55	.59	0.17
ADOS-2	Females			Males			*t*	*p*	Hedges's *g*
	n	*M*	*SD*	*n*	*M*	*SD*			
Social Affect	14	9.36	3.77	14	10.00	3.84	0.45	.66	0.17
Restricted Repetitive Behaviors	14	2.64	1.39	14	4.07	2.53	1.85	.08	0.70
Total Score	14	12.00	4.11	14	14.07	5.36	1.15	.26	0.42
Comparison Score	14	5.50	1.56	14	6.43	1.65	1.53	.14	0.56
Communication – Module 4	5	2.60	1.14	6	2.50	0.55	−0.19	.85	−0.11
Reciprocal Social Interaction – Module 4	5	4.80	1.48	6	6.50	1.05	2.23	.05	1.23
Stereotyped behaviors – Module 4	5	0.20	0.45	6	0.83	0.75	1.65	.13	0.91
Mannerisms	19	0.68	0.89	20	0.85	0.99	0.55	.59	0.17
ADOS−2	Females			Males			*t*	*p*	Hedges's *g*
	n	*M*	*SD*	*n*	*M*	*SD*			
Social Affect	14	9.36	3.77	14	10.00	3.84	0.45	.66	0.17
Restricted Repetitive Behaviors	14	2.64	1.39	14	4.07	2.53	1.85	.08	0.70
Total Score	14	12.00	4.11	14	14.07	5.36	1.15	.26	0.42
Comparison Score	14	5.50	1.56	14	6.43	1.65	1.53	.14	0.56
Communication – Module 4	5	2.60	1.14	6	2.50	0.55	−0.19	.85	−0.11
Reciprocal Social Interaction – Module 4	5	4.80	1.48	6	6.50	1.05	2.23	.05	1.23
Stereotyped behaviors – Module 4	5	0.20	0.45	6	0.83	0.75	1.65	.13	0.91
Mannerisms	19	0.68	0.89	20	0.85	0.99	0.55	.59	0.17

administered to 11 individuals out of 20, presents a different algorithm and evaluates the following areas: Communication, Reciprocal Social Interaction, Imagination, Stereotyped Behaviors and Restricted Interests, and Other Abnormal Behaviors.

2.3. Procedure

Participants and their caregivers were recruited through advertisement in the waiting area of Observation Diagnosis and Training Lab (ODFLab), a clinical research center of the University of Trento. Further, the study was advertised using the laboratory's social media. All families voluntarily expressed their interest in the study.

ODFLab specializes in the functional diagnosis of neuro-developmental conditions where individuals undergo clinical evaluation. The assessment was conducted by two psychologists: one administered clinical measures to the child and was in charge of collecting the SRS from the caregivers and reviewing them for completeness upon return with each parent. Mothers and fathers were requested to complete the forms separately and review them with the psychologist at two different moments.

2.4. Data analysis

Descriptive statistics of the data were calculated along with the Shapiro–Wilk normality check and Levene's test for equality of variances. Independent samples t-tests or Welch's *t*-test, depending on whether variance equality was assumed, were used to investigate differences between males and females in age and clinical tests. To test the first aim of our study, paired-sample t-tests were conducted to compare SRS scores between mothers and fathers. Effect sizes were measured using Hedges' *g*, which presents a correction for small samples (Turner et al., 2006). Hedges' *g* can be interpreted as: lower than 0.19, negligible effect; from 0.20 to 0.49, small effect; from 0.50 to 0.79, intermediate effect; above 0.79, the effect is large.

To address our second aim, examining sex differences in children's SRS scores, we conducted General Linear Models (GLMs) with children's sex as the independent variable, and SRS scores of both mothers and fathers as the dependent variables. Age was included as a covariate.

Given that 12 regressions were performed simultaneously for each dataset, considering both raw scores and standardized scores, a Bonferroni correction was performed to reduce the family-wise error rate, setting the adjusted significance at 0.004. To evaluate the effect of the independent variables on the dependent one, partial eta squared was calculated. A partial eta squared greater than 0.14 indicates a large effect.

3. Results

3.1. Differences between mothers and fathers

Paired-sample t-tests did not reveal significant differences between mothers' and fathers' reports.

See Table 3 for descriptive statistics and *t*-test results.

3.2. Study of sex differences

After applying Bonferroni correction, a significant GLM was found to predict the raw score of Social Communication ($F(3,79) = 10.64$, $p < .001$, $\eta p^2 = .22$, $R^2 = 0.20$) with significant effect of sex ($F(1,79) = 13.61$, $p < .001$, $\eta p^2 = .15$) and age ($F(1,79) = 10.86$, $p = .001$, $\eta p^2 = .12$). In particular, females showed a lower raw score compared to males, $t(78) = -3.04$, $p = .003$, $g = -0.67$. Also the GLM performed to predict the standardized score of Social Communication was significant ($F(3,79) = 6.98$, $p = .002$, $\eta p^2 = .15$, $R^2 = 0.13$) with significant effect of sex ($F(1,79) = 8.39$, $p = .005$, $\eta p^2 = .10$) and age ($F(1,79) = 7.68$, $p = .007$, $\eta p^2 = .09$). In particular, females showed a lower T-score compared to males, $t(78) = -2.41$, $p = .02$, $g = -0.53$, suggesting that females presented a lower severity

Table 3
Descriptive and inferential statistics of Social Responsiveness Scale's scores based on mothers and fathers report.

	Mothers			Fathers			t(39)	*p*	Hedges's *g*
	n	*M*	*SD*	*n*	*M*	*SD*			
Social Awareness Raw	40	9.68	4.52	40	9.65	4.00	0.37	.97	0.006
Social Awareness T-score	40	65.28	15.50	40	65.05	14.12	0.95	.93	0.15
Social Cognition Raw	40	16.63	7.29	40	15.10	6.40	1.90	.06	0.30
Social Cognition T-score	40	74.75	17.19	40	71.33	15.49	1.87	.07	0.30
Social Communication Raw	40	27.73	12.31	40	25.68	11.21	1.51	.14	0.17
Social Communication T-score	40	78.33	19.48	40	75.15	17.63	1.51	.14	0.23
Social Motivation Raw	40	14.83	6.46	40	13.85	5.49	1.25	.22	0.19
Social Motivation T-score	40	77.97	18.34	40	74.45	18.45	1.52	.14	0.19
Mannerisms Raw	40	14.68	7.37	40	13.58	7.56	1.50	.14	0.24
Mannerisms T-score	40	79.13	20.56	40	76.10	21.46	1.59	.12	0.25
Total Raw	40	83.68	31.78	40	77.85	30.61	1.65	.11	0.26
Total T-score	40	81.22	19.24	40	77.97	18.00	1.61	.12	0.25

of behaviors pertaining to this domain,

The model predicting the raw score of Social Motivation was significant ($F(3,79) = 7.50$, $p = .001$, $\eta p^2 = .16$, $R^2 = 0.14$) with significant effect of age ($F(1,79) = 14.89$, $p < .001$, $\eta p^2 = .16$), suggesting that older individuals presented more behaviors associated with autism in this domain.

Further, the model predicting the raw score of Mannerism was significant ($F(3,79) = 10.64$, $p < .001$, $\eta p^2 = .22$, $R^2 = 0.20$) with significant effect of sex ($F(1,79) = 16.74$, $p < .001$, $\eta p^2 = .18$) and age ($F(1,79) = 7.43$, $p = .008$, $\eta p^2 = .09$). In particular, females showed a lower raw score compared to males, $t(78) = -3.58$, $p < .001$, $g = -0.79$, indicating that males presented more repetitive behaviors and restricted interests.

Concluding, the model predicting the raw total score was significant ($F(3,79) = 8.74$, $p < .001$, $\eta p^2 = 0.19$, $R^2 = 0.16$) with significant effect of sex ($F(1,79) = 10.03$, $p = .002$, $\eta p^2 = .12$) and age ($F(1,79) = 10.10$, $p = .002$, $\eta p^2 = .12$). In particular, females showed a lower raw score compared to males, $t(78) = -2.57$, $p = .12$, $g = -0.57$, suggesting that females presented fewer behaviors related to autism compared to males.

See Table 4 for means and standard deviations, and Fig. 1 for the graphical representation of the parameters that presented sex differences.

4. Discussion

The research provides insights into parental perceptions in the context of autism, analyzing sex differences among children. A key innovation of the study is the inclusion of both parents as information sources for each child, acknowledging the importance of involving both caregivers in research, given the increasing role of fathers in childcare (Schoppe-Sullivan and Fagan 2020).

The study was conducted using a parental report measure, the Social Responsiveness Scale, analyzing both raw scores, an approach recommended to avoid prematurely correcting for normative sex differences (Constantino & Gruber, 2012), and T-scores, compared to other studies that only focus on one caregiver, most of the times mothers (Bitsika & Sharpley, 2019; Bölte et al., 2008; Rodgers et al., 2019).

Considering our first objective of exploring differences in mothers' and fathers' reports, we did not find any significant differences. Exploring mothers' and fathers' perceptions represents a novel approach, although their differences have been studied in relation to parenting dimensions (Ozturk et al., 2014). Some studies have shown that mothers report distinctive parenting experiences (Kayfitz et al., 2010), experience higher levels of parenting stress (Davis & Carter, 2008), and demonstrate more effective coping strategies (Grebe et al., 2022). Further, studies report different parenting styles, with some studies showing a more social style in mothers across cultures investigated with the Parental Style Questionnaire, a self-report questionnaire (Giannotti et al., 2021; Ozturk et al., 2014). However, in terms of interaction features, mothers and fathers have been found to exhibit similar profiles both quantitative and qualitative perspectives. When analyzing Emotional Availability, a relational construct that refers to the affective quality and mutual accessibility of a dyad (Biringen et al., 2014), both parents showed suboptimal levels of structuring and sensitivity abilities (Paolizzi et al., 2024). To our knowledge, despite considering caregivers' perceptions of autism-related behaviors, no study has considered both mothers and fathers in a sex-balanced sample. Parents' perceptions align closely with one another, making both parents a valuable and reliable source of information.

In relation to the second aim of exploring children's differences based on sex, we found males presenting greater difficulties in the social communication area and mannerisms, other than the overall symptom severity evaluated with the SRS. Considering Social Communication, parents reported that females present better abilities, both raw and sex-normed scores confirmed this pattern. These results align with studies suggesting that females present better social communication and interaction skills than autistic males, but lower abilities compared to typically developed peers (Wood-Downie et al., 2021). However, no differences emerged with the administration of the ADOS-2 and communication abilities assessment conducted by clinicians. In line with that, communication differences from neurotypicals are a hallmark of autism and one of the earliest indicators of autism reported by parents (Wetherby et al., 2007). However, research suggests that females might present more subtle difficulties, highlighting the need to explore communication abilities by employing different measures that go beyond quantitative assessments of structural language aspects. Direct assessment, self-reporting, and observation should be used as complementary methods to assess communication (Sturrock et al., 2021). The discrepancy between parental perceptions and the clinician's observation should be further investigated, not only by considering the same instrument but also by focusing on the bidirectional nature of social communication during the interaction. This approach may help clarify the mechanisms that, despite similar language abilities from a cognitive standpoint, led to a better perception of communicative abilities. This could be a crucial mechanism to explore to understand what contributes to females' late recognition and time of first access to services, as research shows that females are diagnosed at least two years later compared to males,

Table 4
Mean and standard deviation of Social Responsiveness Scales' parameters that showed sex differences in the total sample.

		Females			Males			$t(78)$	p	Hedges's g
	n	n	M	SD	n	M	SD			
Raw Social Communication	80	40	22.90	12.60	40	30.50	9.55	- 3.04	.003	−0.67
T-score Social Communication	80	40	71.90	20.19	40	81.58	15.49	- 2.41	.02	−0.53
Raw Mannerisms	80	40	11.35	7.77	40	16.90	6.00	- 3.58	< .001	−0.79
Raw Total	80	40	71.97	35.61	40	89.55	24.55	- 2.57	.12	−0.57

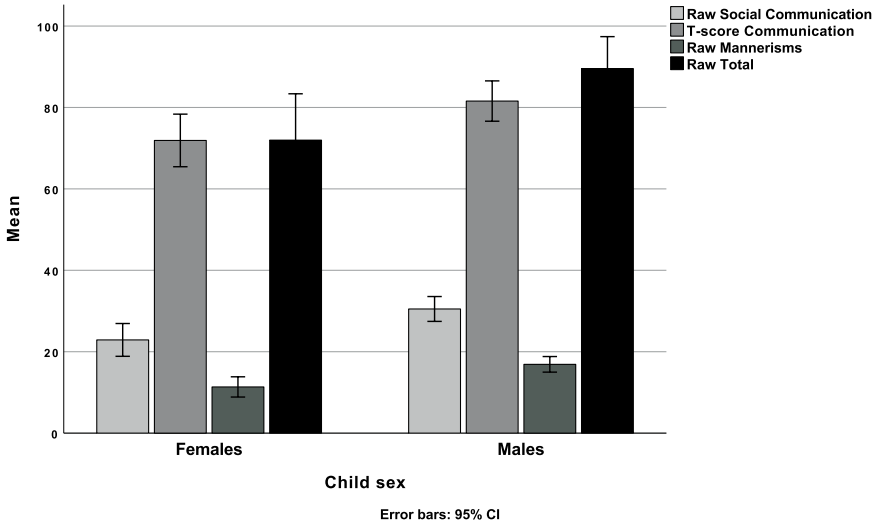

Fig. 1. Social Responsiveness Scales' parameters that showed sex differences in the total sample.

they also present a greater number of diagnoses in adolescence and adulthood (Harrop et al., 2024; Russell et al., 2021). Interestingly, parents reported a lower presence of mannerisms in females; however, this difference did not emerge from the clinician's observation. Studies on mannerisms in relation to sex differences are scarce, as research mainly focuses on the broader category of restricted repetitive behaviors. This suggests the need for a more qualitative approach in diagnostic assessments, which could allow an investigation of different contexts where these behaviors might emerge, as they might not be evident in all situations (Hus et al., 2014). Hence, these might be more subtle and socially accepted (Van Wijngaarden-Cremers et al., 2014). Considering females' repetitive behaviors and restricted interests, adopting a qualitative approach, such as interviews and analysis of anecdotal descriptions, research showed that these are more similar to neurotypical peers' interests, such as fashion and popstars, compared to males' (Lai et al., 2015), or seemingly random interests, such as stickers (Hiller et al., 2014). Further, differences emerge also in the intensity and intrusiveness of these behaviors, as females seem to be subtler, making them less identifiable from both family and professionals (Corbett et al., 2021; Hiller et al., 2014; Van Wijngaarden-Cremers et al., 2014). Among the other models conducted, one that proved to be significant was the one studying Social Motivation, which refers to the preferential orientation to the social world (Chevallier et al., 2012) from preferential orienting toward non-social stimuli, attending more to objects over faces (Congiu et al., 2024) or social over non-social sounds (Klin, 1991), to more complex social difficulties (Chevallier et al., 2012). In particular, autistic individuals seem to show lower motivation compared to neurotypicals. This might be explained by a lowered reward coming from engaging in these activities, as shown through neuroimaging studies (Stavropoulos & Carver, 2013), resulting in decreased opportunities for social learning (Clements et al., 2018). We found greater severity of Social Motivation, Social Communication, and Mannerisms being associated with age, in particular, older individuals showed greater impairments in this area. Our results support the need for a timely diagnosis across both sexes, hence, a late diagnosis can exacerbate symptoms that otherwise could be supported through interventions that allow the individual to carry out successful interactions, determining more learning opportunities, better development of the child, and impact family wellbeing.

Parent reports, which capture everyday observations of the child's behavior in naturalistic settings, did not show significant differences across sexes. These insights are particularly relevant in the context of sex differences, as they highlight how girls' behaviors may appear more socially normative to caregivers, despite comparable symptom severity evaluated by expert clinicians. This perception likely contributes to the well-documented diagnostic delay in females, who are often identified later than males due to more subtle or socially accepted manifestations of autistic traits, as caregivers might be less likely to request an assessment if difficulties observed are not as explicit. Our results are in line with previous research conducted on adults' perceptions. In particular, studies were mainly focused on primary educators' interpretation of children's behaviors (Whitlock et al., 2020), these are relevant as educators' and parents' perceptions are crucial in identifying children's difficulties and achieving early diagnosis. Specifically, Special Educational Needs Coordinators have reported a lack of understanding and confidence in identifying autism presentation in females (Gray et al., 2021), while primary care educators tend to underestimate and under-identify autism in girls (Whitlock et al., 2020).

Understanding why females' behaviors are perceived as more normative is fundamental, hence, females are diagnosed significantly later than males due to harder identification. Further, the presence of sex differences in parents' observations but not clinicians' suggests the presence of mechanisms that mask females' difficulties. However, parent and educator reports are invaluable tools for gaining insight into the naturalistic abilities of autistic individuals. Discrepancies between these reports and clinician observations can be informative about adaptive functioning in the social domain and should prompt further investigation into camouflage behaviors, particularly in autistic females, to better understand the mechanisms that hinder timely and accurate diagnosis. This is in line with literature stating that females exhibit behaviors that are more socially adequate, potentially as a result of camouflage behaviors (Allely, 2018; Tubío-Fungueiriño et al., 2021). Furthermore, difficulties may also emerge depending on the complexity of social demands; as a

result, interacting with familiar adults may elicit different behaviors and a greater sense of comfort. Studying caregivers and clinicians' discrepancies in observation can inform clinical practice and prompt future research.

Future research should build on these findings by adopting mixed-methods designs that allow for the evaluation of social behaviors from multiple perspectives. In particular, structural dynamic analyses of interactions-considering timing, frequency, and sequence of dyadic social behaviors, could be combined with reports filled by caregivers, educators and clinicians to identify which behaviors contribute to differing perceptions. Moreover, current assessments require the identification of specific behaviors, which may not adequately capture the unique features of autistic females. This population has historically been understudied, and existing tools, primarily based on the DSM-5 criteria published in 2013, do not fully reflect the growing body of research on female presentations of autism. Incorporating qualitative analyses of parent interviews may help identify behavioral patterns in females that may otherwise go unnoticed.

Considering the role of age, future studies should adopt a longitudinal design to test if there is a reduction in sex differences over time and which mechanisms are involved. Additionally, it would be beneficial to develop an index related to intervention duration and intensity to better match samples.

4.1. Limitations

Despite the balanced representation of males and females in the current study, its generalizability is limited due to the heterogeneity of participants' ages. This variability in age may have influenced the observed differences, which underscores the need for further investigation, particularly studies that explore developmental trajectories through longitudinal designs. Existing research indicates that autism-related characteristics can vary across childhood and adolescence, with these trajectories influenced by factors such as sex and sociodemographic background (Waizbard-Bartov et al., 2022). Additionally, the age at which autism-related behaviors first manifest may impact how these characteristics evolve, with earlier onset sometimes associated with a decline in these characteristics over time (Riglin et al., 2021). Nevertheless, a meta-analysis found overall stability in autism-related traits during childhood (Bieleninik et al., 2017). These mixed findings suggest that the role of age requires deeper and more nuanced exploration in future research.

Further, our sample is not ethnically or racially diverse, therefore results' generalizability might be further compromised. The lack of information on caregiver mental health and conditions represents a limitation of the current study, as well as the presence of siblings was not accounted for in this study. Future research should conduct a more comprehensive assessment of demographic, cultural, economic, and educational factors as these might influence caregivers' behaviours and perceptions.

5. Conclusions

The aim of our research was to investigate sex differences in autism symptoms reported by parents during diagnostic evaluations through clinical instruments, with the novelty of involving mothers and fathers for each participant. Despite clinicians observing comparable behaviors through the administration of the Autism Diagnostic Observation Schedule-2, parents report sex differences in Social Communication and Mannerisms. Mothers and fathers reported similar behaviors. Finally, age seemed to play an important role, with greater severity presented by older individuals. Considering that parents reported females' behaviors as more normative, parental perceptions and the mechanisms involved should be better explored, as this mechanism might contribute to females' later identification, which in turn limits the access to diagnosis and intervention, determining cascading effects on the individual mental health, quality of life, and family well-being. Furthermore, our findings add information for parental-based interventions that consider caregivers' perceptions of their child, an area often studied primarily in mothers.

CRediT authorship contribution statement

Arianna Bentenuto: Writing – review & editing, Supervision, Data curation, Conceptualization. **Silvia Perzolli:** Writing – review & editing, Writing – original draft, Methodology, Data curation, Conceptualization. **Eleonora Paolizzi:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation.

Declaration of Competing Interest

The authors have nothing to declare as they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

Data availability

Data will be made available on request.

References

Aldridge, F. J., Gibbs, V. M., Schmidhofer, K., & Williams, M. (2012). Investigating the clinical usefulness of the Social Responsiveness Scale (SRS) in a tertiary level, autism spectrum disorder specific assessment clinic. *Journal of Autism and Developmental Disorders, 42*(2), 294–300. https://doi.org/10.1007/s10803-011-1242-9

Allely, C. S. (2018). Understanding and recognising the female phenotype of autism spectrum disorder and the "camouflage" hypothesis: A systematic PRISMA review. *Advances in Autism, 5*(1), 14–37. https://doi.org/10.1108/AIA-09-2018-0036

Allely, C. S. (2019). Exploring the female autism phenotype of repetitive behaviours and restricted interests (RBRIs): A systematic PRISMA review. *Advances in Autism, 5*(3), 171–186. https://doi.org/10.1108/AIA-09-2018-0030

American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.). https://doi.org/10.1176/appi.books.9780890425787.

American Psychiatric Association [APA]. (2013). *Diagnostic and statistical manual of mental disorders (5th ed.)*. https://doi.org/10.1176/appi.books.9780890425596.

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

Bieleninik, Ł., Posserud, M. B., Geretsegger, M., Thompson, G., Elefant, C., & Gold, C. (2017). Tracing the temporal stability of autism spectrum diagnosis and severity as measured by the Autism Diagnostic Observation Schedule: A systematic review and meta-analysis. *PloS One, 12*(9), Article e0183160. https://doi.org/10.1371/journal.pone.0183160

Biringen, Z., Derscheid, D., Vliegen, N., Closson, L., & Easterbrooks, M. A. (2014). Emotional availability (EA): Theoretical background, empirical research using the EA Scales, and clinical applications. *Developmental Review, 34*(2), 114–167. https://doi.org/10.1016/j.dr.2014.01.002

Bitsika, V., & Sharpley, C. F. (2019). Effects of diagnostic severity upon sex differences in behavioural profiles of young males and females with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 49*(11), 4429–4440. https://doi.org/10.1007/s10803-019-04159-x

Bölte, S., Poustka, F., & Constantino, J. N. (2008). Assessing autistic traits: Cross-cultural validation of the social responsiveness scale (SRS). *Autism. Research, 1*(6), 354–363. https://doi.org/10.1002/aur.49

Charman, T., Baird, G., Simonoff, E., Loucas, T., Chandler, S., Meldrum, D., & Pickles, A. (2007). Efficacy of three screening instruments in the identification of autistic-spectrum disorders. *The British Journal of Psychiatry: The Journal of Mental Science, 191*, 554–559. https://doi.org/10.1192/bjp.bp.107.040196

Chellew, T., Barbaro, J., & Freeman, N. C. (2022). The early childhood signs of autism in females: A systematic review. *Review Journal of Autism and Developmental Disorders*. https://doi.org/10.1007/s40489-022-00337-3

Chevallier, C., Kohls, G., Troiani, V., Brodkin, E. S., & Schultz, R. T. (2012). The social motivation theory of autism. *Trends in Cognitive Sciences, 16*(4), 231–239. https://doi.org/10.1016/j.tics.2012.02.007

Clements, C. C., Zoltowski, A. R., Yankowitz, L. D., Yerys, B. E., Schultz, R. T., & Herrington, J. D. (2018). Evaluation of the social motivation hypothesis of autism: A systematic review and meta-analysis. *JAMA Psychiatry, 75*(8), 797–808. https://doi.org/10.1001/jamapsychiatry.2018.1100

Congiu, S., Doneddu, G., & Fadda, R. (2024). Attention toward social and non-social stimuli in preschool children with autism spectrum disorder: A paired preference eye-tracking study. *International Journal of Environmental Research and Public Health, 21*(4), 421. https://doi.org/10.3390/ijerph21040421

Constantino, J.N., & Gruber, C.P. (2012). *Social Responsiveness Scale*, *Second Edition* (SRS-2). Western Psychological Services.

Constantino, J. N., Gruber, C. P., Davis, S., Hayes, S., Passanante, N., & Przybeck, T. (2004). The factor structure of autistic traits. *Journal of Child Psychology and Psychiatry, and Allied Disciplines, 45*(4), 719–726. https://doi.org/10.1111/j.1469-7610.2004.00266.x

Corbett, B. A., Schwartzman, J. M., Libsack, E. J., Muscatello, R. A., Lerner, M. D., Simmons, G. L., & White, S. W. (2021). Camouflaging in autism: Examining sex-based and compensatory models in social cognition and communication. *Autism Research, 14*(1), 127–142. https://doi.org/10.1002/aur.2440

Davis, N. O., & Carter, A. S. (2008). Parenting stress in mothers and fathers of toddlers with autism spectrum disorders: Associations with child characteristics. *Journal of Autism and Developmental Disorders, 38*(7), 1278–1291. https://doi.org/10.1007/s10803-007-0512-z

Geelhand, P., Bernard, P., Klein, O., Van Tiel, B., & Kissine, M. (2019). The role of gender in the perception of autism symptom severity and future behavioral development. *Molecular Autism, 10*, 1–8.

Giannotti, M., Bonatti, S. M., Tanaka, S., Kojima, H., & de Falco, S. (2021). Parenting stress and social style in mothers and fathers of children with autism spectrum disorder: A cross-cultural investigation in Italy and Japan. *Brain Sciences, 11*(11), 1419. https://doi.org/10.3390/brainsci11111419

Gray, L., Bownas, E., Hicks, L., Hutcheson-Galbraith, E., & Harrison, S. (2021). Towards a better understanding of girls on the Autism spectrum: Educational support and parental perspectives. *Educational Psychology in Practice, 37*(1), 74–93. https://doi.org/10.1080/02667363.2020.1863188

Grebe, S. C., Mire, S. S., Kim, H., & Keller-Margulis, M. A. (2022). Comparing fathers' and mothers' perspectives about their child's autism spectrum disorder. *Journal of Autism and Developmental Disorders, 52*(4), 1841–1854. https://doi.org/10.1007/s10803-021-05077-7

Griffiths, R., Huntley, M., (1196) *The Griffiths mental development scales-revised manual: From birth to 2 Years*. (ARICD, ed.). High Wycombe.

Hamdani, Y., Kassee, C., Walker, M., Lunsky, Y., Gladstone, B., Sawyer, A., Ameis, S. H., Desarkar, P., Szatmari, P., & Lai, M.-C. (2023). Roadblocks and detours on pathways to a clinical diagnosis of autism for girls and women: A qualitative secondary analysis, 17455057231163761 *Women'States Health, 19*. https://doi.org/10.1177/17455057231163761.

Harrop, C., Tomaszewski, B., Putnam, O., Klein, C., Lamarche, E., & Klinger, L. (2024). Are the diagnostic rates of autistic females increasing? An examination of state-wide trends. *Journal of Child Psychology and Psychiatry, and Allied Disciplines, 65*(7), 973–983. https://doi.org/10.1111/jcpp.13939

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

Hollingshead, A. B. (2011). Four factor index of social status. *Yale Journal of Sociology, 8*(11), 21–51.

Hull, L., Petrides, K. V., Allison, C., Smith, P., Baron-Cohen, S., Lai, M.-C., & Mandy, W. (2017). "Putting on my best normal": Social camouflaging in adults with autism spectrum conditions. *Journal of Autism and Developmental Disorders, 47*(8), 2519–2534. https://doi.org/10.1007/s10803-017-3166-5

Hull, L., Petrides, K. V., & Mandy, W. (2020). The female autism phenotype and camouflaging: A narrative review. *Review Journal of Autism and Developmental Disorders, 7*(4), 306–317. https://doi.org/10.1007/s40489-020-00197-9

Hus, V., Bishop, S., Gotham, K., Huerta, M., & Lord, C. (2013). Factors influencing scores on the social responsiveness scale. *Journal of Child Psychology and Psychiatry, and Allied Disciplines, 54*(2), 216–224. https://doi.org/10.1111/j.1469-7610.2012.02589.x

Hus, V., Gotham, K., & Lord, C. (2014). Standardizing ADOS domain scores: Separating severity of social affect and restricted and repetitive behaviors. *Journal of Autism and Developmental Disorders, 44*(10), 2400–2412. https://doi.org/10.1007/s10803-012-1719-1

Hutson, P., & Hutson, J. (2023). Autism in females understanding the overlooked diagnoses unique challenges and recommendations. *Journal of Clinical and Medical Images, Case Reports, 3*(3). https://doi.org/10.55920/2771-019X/1461

Kayfitz, A. D., Gragg, M. N., & Robert Orr, R. (2010). Positive experiences of mothers and fathers of children with autism. *Journal of Applied Research in Intellectual Disabilities, 23*(4), 337–343. https://doi.org/10.1111/j.1468-3148.2009.00539.x

Kasari, C., & Sigman, M. (1997). Linking parental perceptions to interactions in young children with autism. *Journal of Autism and Developmental Disorders, 27*, 39–57. https://doi.org/10.1023/A:1025869105208

Kissel, S. D., & Nelson, W. M., III (2016). Parents' perceptions of the severity of their child's autistic behaviors and differences in parental stress, family functioning, and social support. *Focus on Autism and Other Developmental Disabilities, 31*(2), 152–160.

Klin, A. (1991). Young autistic children's listening preferences in regard to speech: A possible characterization of the symptom of social withdrawal. *Journal of Autism and Developmental Disorders, 21*(1), 29–42.

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

Lord, C., Rutter, M., Di Lavore, P., Risi, S., Luyster, R., & Gotham, K. (2012). *Autism diagnostic observation schedule*, second edition (ADOS-2) [Dataset]. https://doi.org/10.1037/t54175-000.

McDonnell, C. G., DeLucia, E. A., Hayden, E. P., Penner, M., Curcin, K., Anagnostou, E., Nicolson, R., Kelley, E., Georgiades, S., Liu, X., & Stevenson, R. A. (2021). Sex differences in age of diagnosis and first concern among children with autism spectrum disorder. *Journal of Clinical Child Adolescent Psychology, 50*(5), 645–655. https://doi.org/10.1080/15374416.2020.1823850

McFayden, T. C., Antezana, L., Albright, J., Muskett, A., & Scarpa, A. (2020). Sex differences in an autism spectrum disorder diagnosis: Are restricted repetitive behaviors and interests the key. *Review Journal of Autism and Developmental Disorders, 7*(2), 119–126. https://doi.org/10.1007/s40489-019-00183-w

Navot, N., Jorgenson, A. G., & Webb, S. J. (2017). Maternal experience raising girls with autism spectrum disorder: A qualitative study. *Child: Care, Health and Development, 43*(4), 536–545. https://doi.org/10.1111/cch.12470

Orsini, A., Pezzuti, L., & Picone, L. (2012). *WISC-IV: Contributo alla Taratura Italiana, [WISC-IV Italian Edition]. Florence, Italy*: Giunti OS.

Ozturk, Y., Ricadonna, S., & Venuti, P. (2014). Parenting dimensions in mothers and fathers of children with Autism Spectrum Disorders. *Research in Autism Spectrum Disorders, 8*(10), 1295–1306. https://doi.org/10.1016/j.rasd.2014.07.001

Paolizzi, E., Perzolli, S., Bentenuto, A., Bertamini, G., & Venuti, P. (2024). Characterization of dyadic interaction features between fathers and mothers playing with their autistic children. *Acta psychologica, 248*, Article 104411. https://doi.org/10.1016/j.actpsy.2024.104411

Riglin, L., Wootton, R. E., Thapar, A. K., Livingston, L. A., Langley, K., Collishaw, S., Tagg, J., Smith, G. D., Stergiakouli, E., Tilling, K., & Thapar, A. (2021). Variable emergence of autism spectrum disorder symptoms from childhood to early adulthood. *The American Journal of Psychiatry, 178*(8), 752–760. https://doi.org/10.1176/appi.ajp.2020.20071119

Rodgers, J. D., Lodi-Smith, J., Donnelly, J. P., Lopata, C., McDonald, C. A., Thomeer, M. L., Lipinski, A. M., Nasca, B. C., & Booth, A. J. (2019). Brief Report: Examination of Sex-Based Differences in ASD Symptom Severity Among High-Functioning Children with ASD Using the SRS-2. *Journal of Autism and Developmental Disorders, 49*(2), 781–787. https://doi.org/10.1007/s10803-018-3733-4

Russell, G., Stapley, S., Newlove-Delgado, T., Salmon, A., White, R., Warren, F., Pearson, A., & Ford, T. (2021). Time trends in autism diagnosis over 20 years: A UK population-based cohort study. *Journal of Child Psychology and Psychiatry*. https://doi.org/10.1111/JCPP.13505

Schoppe-Sullivan, S. J., & Fagan, J. (2020). The evolution of fathering research in the 21st century: Persistent challenges, new directions. *Journal of Marriage and Family, 82*, 175–197. https://doi.org/10.1111/jomf.12645)

Stavropoulos, K. K. M., & Carver, L. J. (2013). Research review: Social motivation and oxytocin in autism – Implications for joint attention development and intervention. *Journal of Child Psychology and Psychiatry, 54*(6), 603–618. https://doi.org/10.1111/jcpp.12061

Sturrock, A., Adams, C., & Freed, J. (2021). A subtle profile with a significant impact: Language and communication difficulties for autistic females without intellectual disability. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.621742

Sutherland, R., Hodge, A., Bruck, S., Costley, D., & Klieve, H. (2017). Parent-reported differences between school-aged girls and boys on the autism spectrum. *Autism, 21*(6), 785–794. https://doi.org/10.1177/1362361316668653

Tubío-Fungueiriño, 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

Turner, H. M., Iii, & Bernard, R. M. (2006). Calculating and synthesizing effect sizes. *Contemporary Issues in Communication Science and Disorders, 33*(Spring), 42–55. https://doi.org/10.1044/cicsd_33_S_42

Van Wijngaarden-Cremers, P. J. M., van Eeten, E., Groen, W. B., Van Deurzen, P. A., Oosterling, I. J., & Van der Gaag, R. J. (2014). Gender and age differences in the core triad of impairments in autism spectrum disorders: A systematic review and meta-analysis. *Journal of Autism and Developmental Disorders, 44*(3), 627–635. https://doi.org/10.1007/s10803-013-1913-9

Waizbard-Bartov, E., Ferrer, E., Heath, B., Rogers, S. J., Nordahl, C. W., Solomon, M., & Amaral, D. G. (2022). Identifying autism symptom severity trajectories across childhood. *Autism Research: Official Journal of the International Society for Autism Research, 15*(4), 687–701. https://doi.org/10.1002/aur.2674

Watson, L.E. (2014). *"Living Life in the Moment": Chronic Stress and Coping Among Families of High-Functioning Adolescent Girls with Autism Spectrum Disorder* [School of Social Work, Boston College]. http://dlib.bc.edu/islandora/object/bc-ir:103562.

Wetherby, A. M., Watt, N., Morgan, L., & Shumway, S. (2007). Social communication profiles of children with autism spectrum disorders late in the second year of life. *Journal of Autism and Developmental Disorders, 37*(5), 960–975. https://doi.org/10.1007/s10803-006-0237-4

Whitlock, A., Fulton, K., Lai, M.-C., Pellicano, E., & Mandy, W. (2020). Recognition of girls on the autism spectrum by primary school educators: An experimental study. *Autism Research, 13*(8), 1358–1372. https://doi.org/10.1002/aur.2316

Wood-Downie, H., Wong, B., Kovshoff, H., Cortese, S., & Hadwin, J. A. (2021). Research Review: A systematic review and meta-analysis of sex/gender differences in social interaction and communication in autistic and nonautistic children and adolescents. *Journal of Child Psychology and Psychiatry, and Allied Disciplines, 62*(8), 922–936. https://doi.org/10.1111/jcpp.13337