



Characterizing mental health in boys vs. girls with ASD or suspected ASD

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Introduction

- Most research studies on ASD have been conducted with exclusively or predominantly male cohorts.
- Autistic girls and women have been historically understudied.
- Although a growing literature highlights gender differences in clinical presentation in ASD (Constantino, 2017), less is known about how autistic girls may differ from boys with regard to anxiety and other mental health symptoms.

The goal of the present study was to characterize anxiety and other mental health symptoms in boys vs. girls who participated in school-based CBT for Anxiety (i.e., Facing Your Fears-School Based; FYF-SB; Reaven et al., 2022).

- Hypothesis:** We hypothesized that boys and girls with ASD or suspected ASD would differ on measures of anxiety.

Methods

Participants: 119 youth ages 7–15 (mean: 11 years \pm 1.8) with ASD or suspected ASD and clinical anxiety enrolled in one of two studies examining the effectiveness of FYF-SB (Reaven et al., 2022) (n=26 girls; n=93 boys)

Inclusion Criteria: chronological age 7-15, confirmed or suspected ASD, no diagnosis of intellectual disability, and clinically significant anxiety symptoms

Measures: We examined self- and caregiver-report measures of anxiety, social communication, and strengths/difficulties at baseline using the following measures:

- Screen for Child Anxiety Related Disorders, parent- and child-report (SCARED; Birmaher et al., 1997)
- Social Responsiveness Scale (SRS-2; Constantino et al., 2012)
- Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997).

Data analysis: Multiple regression models were used to test for associations between gender and mental health measures, controlling for social communication difficulties.

Results

Boys and girls did not differ on measures of anxiety at baseline (SCARED parent/child), controlling for ASD-related symptoms (SRS-2 total scores).

Caregiver-reported ASD symptoms (SRS-2 total scores) were significantly associated with all domains of anxiety on the SCARED parent report form (all r s > 0.39, all p s < 0.05, uncorrected; see Figure 1).

In the RCT sample (n = 88), boys showed higher levels of parent-reported hyperactivity than girls (SDQ), controlling for SRS-2 total scores ($t = -2.00$, $p = 0.05$, uncorrected, partial $r^2 = 0.04$; see Figure 2).

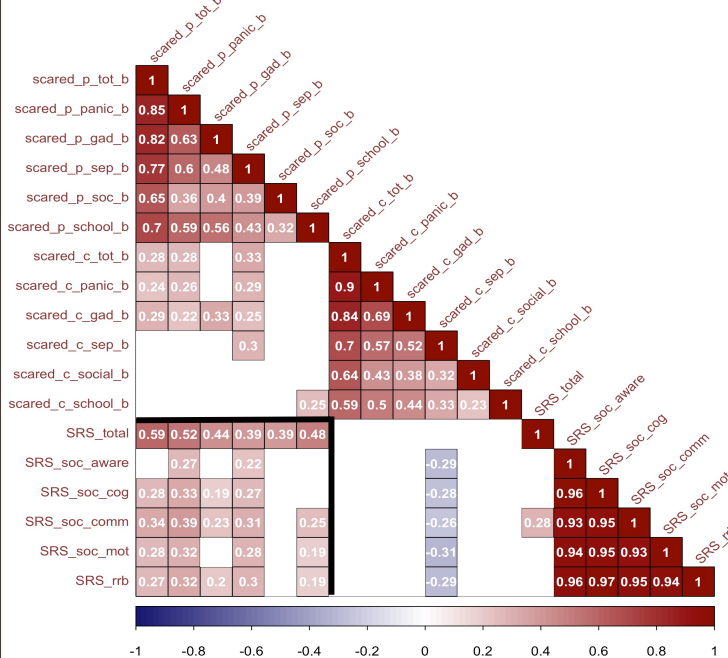


Figure 1 | Correlation heat map depicting bivariate Pearson's correlations between the SCARED parent- and child-report. Only significant correlations (at $p < 0.05$, uncorrected) are displayed in color. Warm colors represent positive associations, and cool colors represent negative associations. Black bars highlight the associations between ASD symptoms (SRS-2 scores) and parent-reported anxiety (SCARED).

Variable key:

- scared_p/c_tot:** SCARED total parent-/child-report scores;
- scared_p/c_gad:** SCARED generalized anxiety parent-/child-report scores;
- scared_p/c_sep:** SCARED separation anxiety parent-/child-report scores;
- scared_p/c_soc:** SCARED social anxiety parent-/child-report scores;
- scared_p/c_school:** SCARED school avoidance parent-/child-report scores;
- SRS_total:** SRS-2 total scores;
- SRS_soc_aware:** SRS-2 social awareness scores;
- SRS_soc_cog:** SRS-2 social cognition scores;
- SRS_soc_comm:** SRS-2 social communication;
- SRS_soc_mot:** SRS-2 social motivation scores;
- SRS_rrb:** SRS-2 restrictive and repulsive behavior scores.

Results, Cont'd

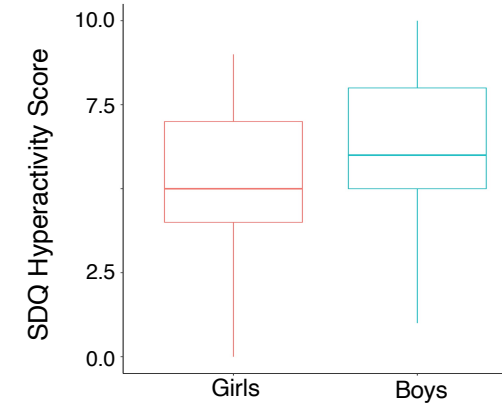


Figure 2 | Box plot showing means and inter-quartile ranges for parent-rated hyperactivity in girls vs. boys (SDQ).

Conclusions, Future Work, & Limitations

- Conclusions:** Youth with ASD or suspected ASD showed a lack of gender differences in measures of anxiety pre-intervention.
- These findings stand in contrast to a robust literature documenting gender-related differences in anxiety in youth without ASD (Lewinsohn, 1998).
- Boys with ASD showed higher levels of parent-reported hyperactivity than girls, in line with previous work in non-ASD youth (Rucklidge, 2010).
- Youth with ASD showed strong associations between ASD-related symptoms and measures of anxiety.
 - In particular, increased parent-reported ASD-related symptoms (SRS-2) corresponded with higher levels of anxiety (SCARED).
- These findings suggest that in ASD, anxiety may be more strongly related to features of autism than to gender-related mechanisms.
- The lack of observed gender differences in the present study aligns well with previous work documenting a lack of gender neural differentiation in youth with ASD compared to typically developing youth (Olson et al., 2020).
- Future work** will examine whether boys and girls differ in their responsiveness to school-based CBT for anxiety.
- Limitations:** moderate sample size, discrepant sample sizes between boys and girls, and lack of measurement on the con/discordance of sex assigned at birth and gender identity.

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References: Constantino et al., (2017); Reaven et al., (2022); Birmaher et al., (1997); Constantino et al., (2012); Goodman (1997); Lewinsohn (1998); Rucklidge (2010); Olson et al., (2020)