

Background

- Autism Spectrum Disorder (ASD) is associated with greater risk of internalising disorders (depression, anxiety) compared to the general population (1).
- Comorbidities in ASD are associated with functional impairments, emotional/behavioural issues, poor quality of life and increased suicide/self-harm (2).
- ASD is a male-predominated diagnosis (gender ratio 3M:1F), and autism in girls is more likely to be missed, delayed or mis-diagnosed (3,4).
- This may leave girls with autism/high autistic traits (particularly those without intellectual disability) without diagnosis and support, leading to poorer mental health (5,6).
- Examining the role of autistic traits rather than ASD diagnoses is becoming increasingly important, given the high heritability which may lead to subclinical autism and broader autistic phenotypes (7).

Methods

- Data used in this study were taken from 556 participants (mean age 22.4) from the Individual Differences in EEG in young Adults Study (IDEAS; PI McLoughlin).
- Scales used: 1) Social Responsiveness Scale (SRS-2) (a self-report scale for autistic traits) (8), 2) Autism Diagnostic Observation Schedule (ADOS) (researcher observation of autistic traits) (9), 3) Mini International Neuropsychiatric Interview (MINI) (a semi-structured interview for mental health disorders using DSM-IV criteria) (10).
- Autistic traits were examined in relation to MINI diagnoses by gender, using Spearman's Rank Correlation and binary logistic regression.

Hypotheses

- Autistic traits will correlate with greater mental health difficulties.
- Being female will confer added vulnerability to mental health difficulties.
- In girls versus boys, high autistic traits will be more impairing with regards to mental health.

Results

- Hypothesis 1:** SRS-2 and ADOS calibrated severity score (CSS) were significant predictors of participants endorsing at least one anxiety or depressive disorder.
- Hypothesis 2:** being female did significantly and independently increase the likelihood meeting thresholds for depressive disorders and anxiety disorders.
- Hypothesis 3:** the interaction between gender and ADOS CSS scales had a significant impact on the likelihood of endorsing an anxiety or major depressive disorder (MDD); odds ratios (ORs) were significant for girls but not for boys (see Table 2 and Figures 1-4).
- SRS-2 scores and ADOS CSS were significantly correlated with the number of MINI disorders endorsed. The correlation of ADOS CSS with number of MINI disorders was significantly stronger in girls than boys (girls $r_s=0.38$, boys $r_s=0.16$ ($z_s=2.77$, $p<0.01$)).

Table 1: Sample characteristics

Variable	Total	Female	Male
High ADOS CSS (%)	8.6	2.7	5.9
High SRS-2 Traits (%)	20.9	9.7	11.2
Any Anxiety Disorder (%)	27.1	17.0	10.1
MDD (%)	7.4	4.7	2.7

Table 2: Comparison of odds ratios (OR) from binary logistic regression models. * denotes $p<.05$. **** denotes $p<.0001$

Disorder	Predictor	OR (95% CI)
MDD	Gender x SRS-2	1.01 (0.98-1.04)
MDD	Gender x ADOS CSS	0.73* (0.57-0.94)
	Odds Ratio (Girls)	1.56**** (1.22-2.00)
Any Anxiety Disorder	Gender x SRS-2	1.00 (0.98-1.02)
Any Anxiety Disorder	Gender x ADOS CSS	0.67* (0.47-0.95)
	Odds Ratio (Girls)	1.50**** (1.23-1.85)

Figure 1: predictive plots of autistic trait measure (self-reported, SRS-2; observer-rated, ADOS) on likelihood of an anxiety disorder

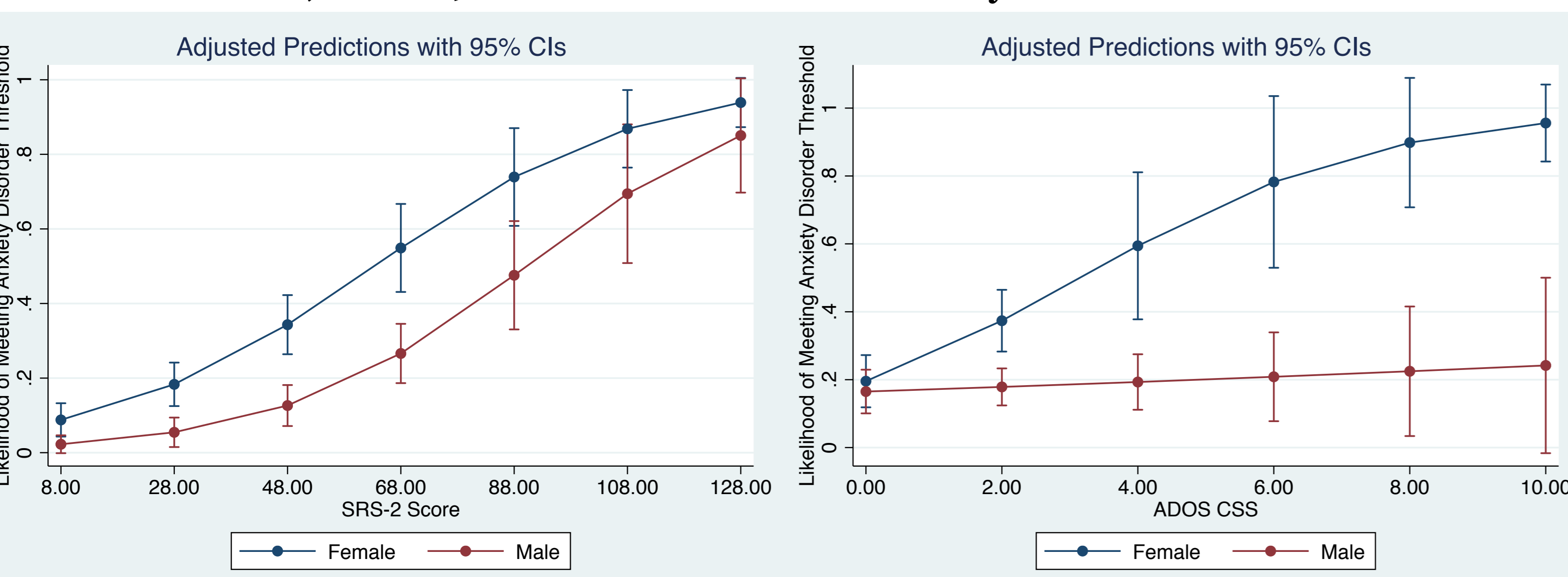
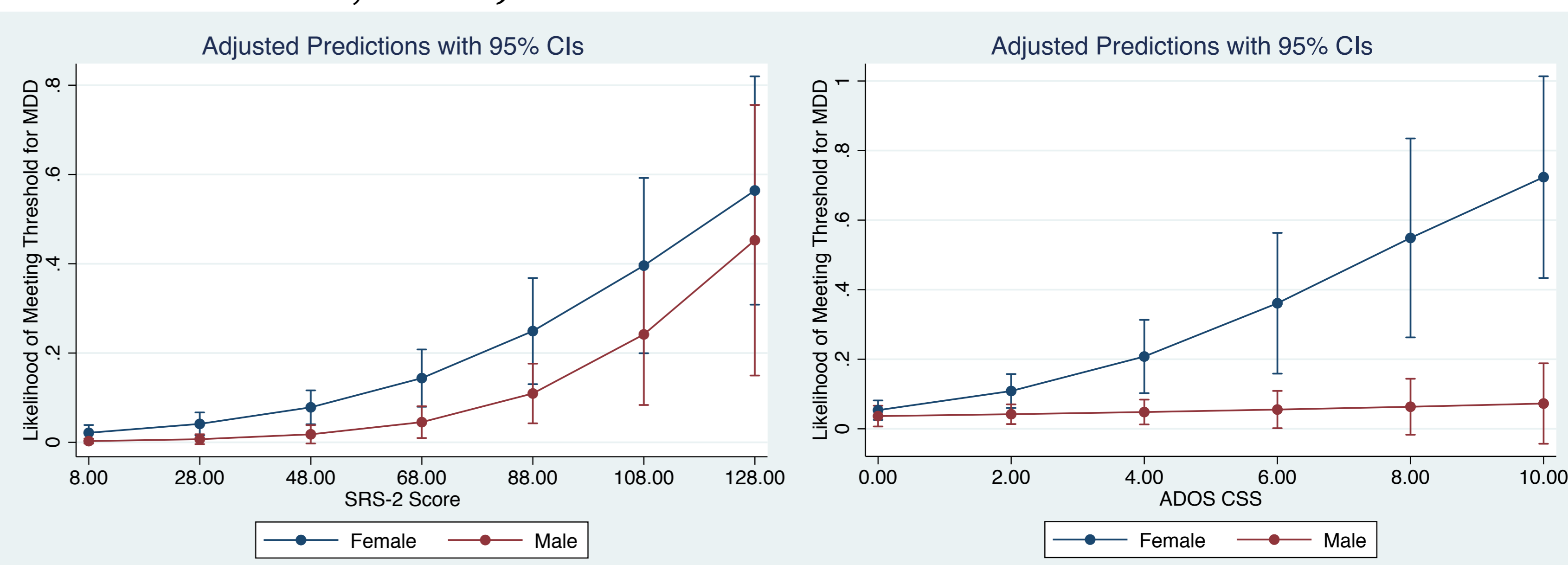


Figure 2: predictive plots of autistic trait measure (self-reported, SRS-2; observer-rated, ADOS) on likelihood of MDD.



Discussion

- Our data support our hypotheses that both autistic traits and being female independently increase the risk of internalising disorders.
- In relation to our third hypothesis, correlations and regressions showed that *observed* (but not self-reported) autistic traits were more related to mental health difficulties in girls than in boys. This is a novel finding.
- Possible reasons for this finding include: a) internalising disorders make autistic traits in girls more obvious to observers in the ADOS, b) girls, but not boys who have more noticeable autistic traits are subject to more negative experiences (e.g., bullying and victimisation) leading to internalising disorders.
- Our study is limited by the use of a cross-sectional design and depression/anxiety measures not tailored to autistic people.
- Note that our study examined autistic traits and we do not know the diagnostic status of all participants
- Future directions would include further research into whether specific autistic traits (e.g. theory of mind deficits, camouflaging) drive gender differences, and whether similar gender interactions are seen for other conditions commonly comorbid in ASD (e.g. ADHD, OCD).

Conclusion

- The current results provide evidence that the relationship between autistic traits and mental health difficulties is different for males and females.
- Furthermore, they suggest a difference in this relationship depending on whether autistic traits are measured by self-report (SRS-2) or behavioural observation (ADOS). These results have implications for improving the experience of girls with autism, who currently are an under-recognised and underserved population.

References

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