

Background

Autism Spectrum Disorder is a developmental disorder that is characterized by impairments in social communication and behavioral skills (CDC, 2020).

- Individuals with ASD often exhibit repetitive behaviors such as motor movements like hand flapping or more ritualistic behaviors such as performing tasks in a particular order (Lam & Aman, 2006).
- Repetitive behaviors are also often seen in individuals with some anxiety disorders (most notably in OCD) (Postorino et al., 2017)
- Other studies have shown that the presence of a comorbid anxiety disorder can lead to an increase in symptom severity in the social or communication impairments of ASD (Zaboski & Storch, 2018).
- Given that repetitive behaviors are seen in both ASD and in anxiety disorders and the tendency for comorbid anxiety to exacerbate some ASD symptoms, we hypothesize that:
  - Children with ASD and a comorbid anxiety disorder will have higher severity scores than ASD only children on an assessment for overall repetitive behavior.
  - Children with ASD and a comorbid anxiety disorder will have higher severity scores than ASD only children on repetitive behavior subscales.
  - Sex differences will also be explored to see if they interact with these relationships.

Methods

Participants

A total of 183 children between the ages of 8 and 17 with a confirmed diagnosis of ASD were included in this study.

	ASD only	ASD + Anxiety	Males	Females
N	123	60	104	79
Age (in months)	M: 149.59 SD: 35.07	M: 153.53 SD: 33.90	M: 152.07 SD: 35.38	M: 150.59 SD: 33.67

Measures

Parents completed the **Autism Center of Excellence (ACE) medical history** form, which collected information about the child's medical diagnoses, including if they had been diagnosed with an anxiety disorder.

- The presence or absence of an anxiety disorder was self-reported. Children with an indicated anxiety disorder were placed into the ASD + anxiety group, those who did not were placed into the ASD only group.

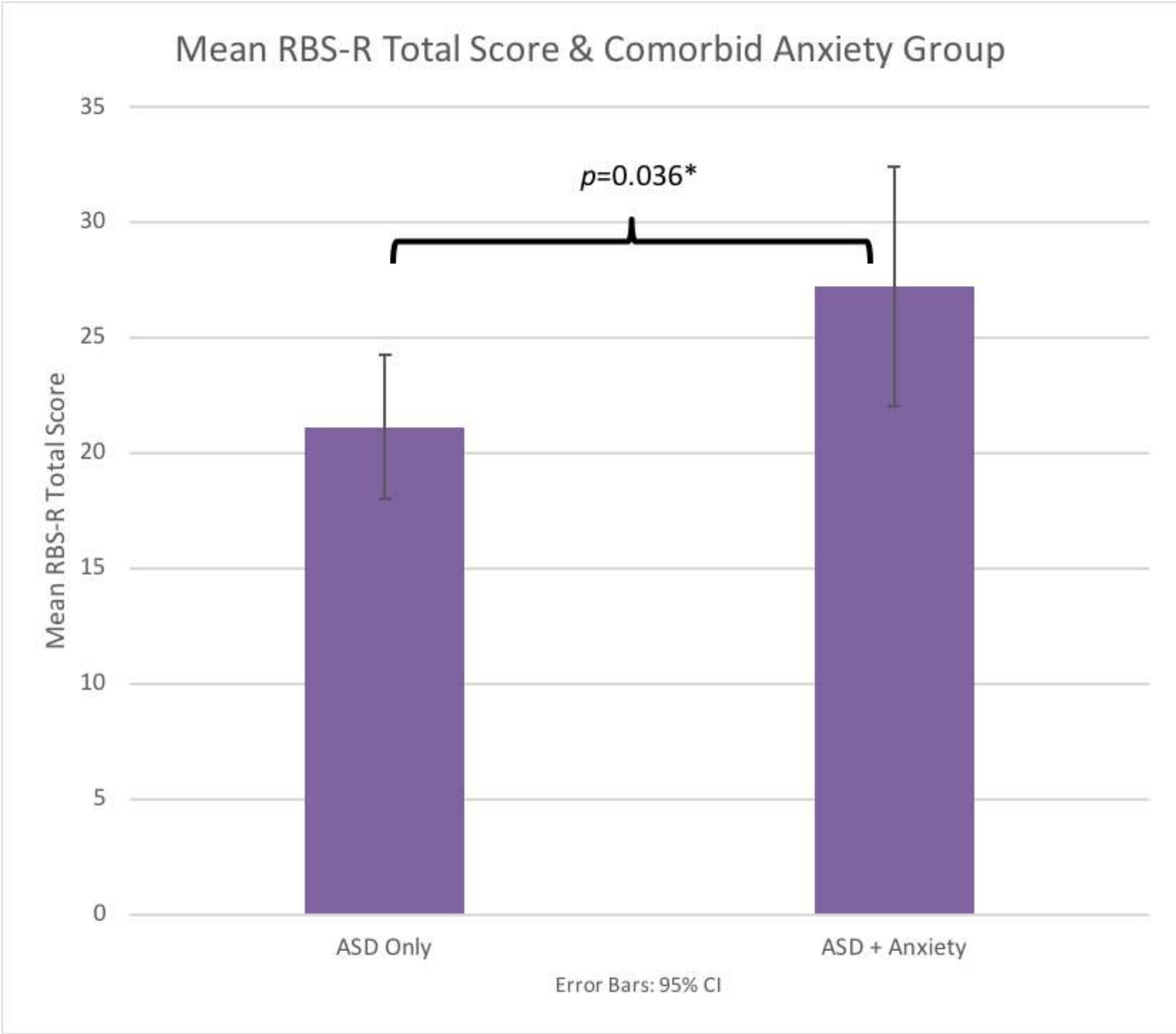
Parents also completed the **Repetitive Behavior Scale- Revised (RBS-R)** which is a 44-item questionnaire that assess repetitive behaviors overall and on six different subscales (Lam & Aman, 2006):

- Stereotyped behavior:** consists of bodily movements that serve no clear function other than to be repeated
- Self-injurious behavior:** consists of behavior that can cause harm or injury to the body
- Compulsive behavior:** repeating actions according to some rule
- Ritualistic behavior:** consists of going about daily tasks in similar manner
- Sameness behavior:** consists of being unwilling or resistant to change
- Restricted behavior:** consists of wanting to focus only on certain activities or interests

Results

**Question 1: Is there a difference in total RBS-R score in children with ASD with and without anxiety?**

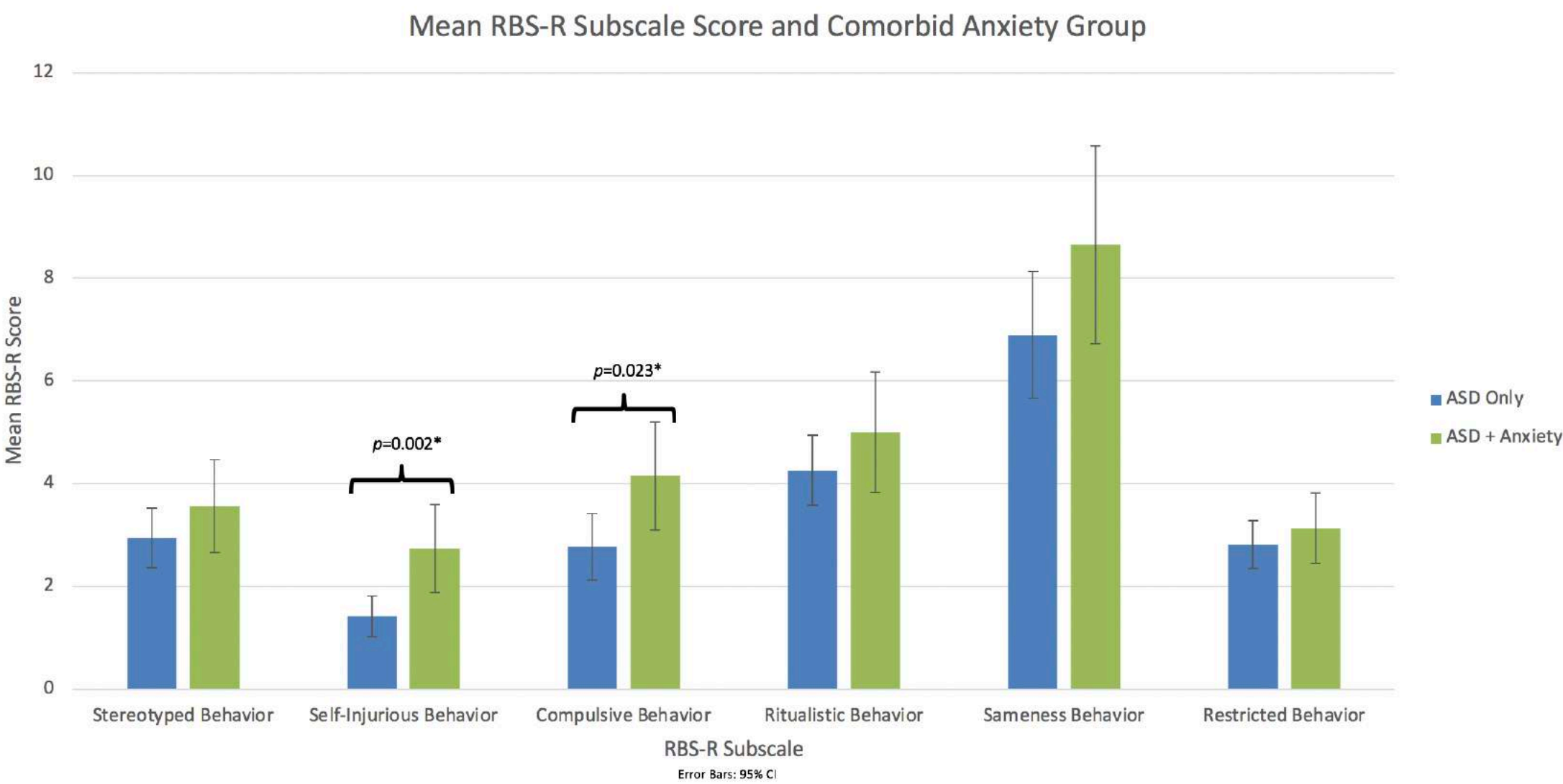
*An independent samples T-test was run in order to compare mean total RBS-R scores between the ASD only and ASD + anxiety groups.*



Individuals in the **ASD + anxiety group scored significantly higher RBS-R total scores** compared to the ASD only group ( $t(181) = -2.12, p < 0.05$ ).

**Question 2: Is there a difference in RBS-R subscale scores in children with ASD with and without anxiety?**

*A series of independent sample T-tests were then conducted in order to see which RBS-R subscales showed a significant difference in scores between the ASD only and ASD + anxiety groups*

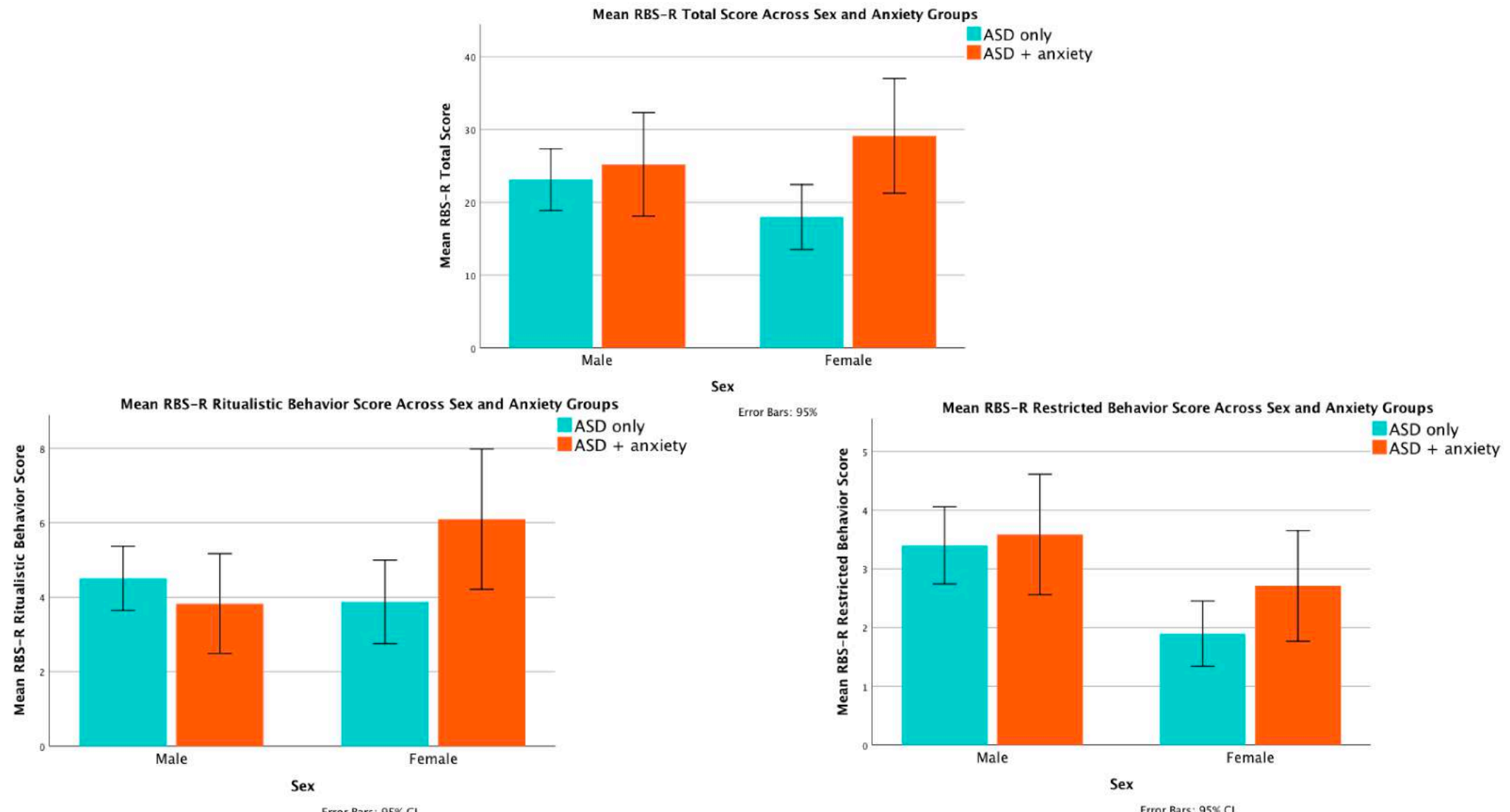


Individuals in the **ASD + anxiety group scored significantly higher than those in the ASD only group on the RBS-R subscales for self-injurious ( $t(181) = -3.15, p < 0.05$ ) and compulsive behavior ( $t(181) = -2.30, p < 0.05$ )**. There were no significant differences between groups on the other RBS-R subscales including the stereotyped, ritualistic, sameness, and restricted behavior scales.

Results (cont.)

**Question 3: Is there an interaction between sex and anxiety group?**

*In order to assess if there was an interaction between sex and the presence or absence of a comorbid anxiety disorder on the association between RBS-R scores in children with ASD, a series of univariate analysis of variance tests were conducted (for the RBS-R total and subscale scores).*



There were no significant interactions found between sex and anxiety group on RBS-R total scores. **Only one of the RBS-R subscales (ritualistic behavior) showed a significant interaction between sex and anxiety group ( $F(1) = 5.19, p < 0.05$ )**. Indicating that on this subscale, the effect of anxiety group on RBS-R score is dependent on sex, and the effect is in the opposite direction for ASD only vs ASD + anxiety groups. Additionally, **only one RBS-R subscale (restricted behavior) showed a main effect of sex, with boys scoring significantly higher than girls ( $F(1)= 8.57, p < 0.05$ )**.

Discussion

Summary

- There were significant differences seen in RBS-R total scores between children in ASD only and ASD + anxiety groups, with ASD + anxiety having more repetitive and restrictive behaviors.
- Only two of the RBS-R subscales, however, we found significant differences between the ASD only and ASD + anxiety groups. The subscales for self-injurious and compulsive behavior both had significantly higher scores for the group of children with ASD and anxiety.
- There were no interactions found between sex and anxiety group for the RBS-R total scores, indicating that this relationship was not moderated by sex.
- Of all the RBS-R subscales, only ritualistic behavior showed a significant interaction, suggesting that for this type of behavior, sex does have a moderating effect.

Limitations

- The ACE medical history questionnaire used to assess the presence or absence of a comorbid anxiety disorder was a self-report questionnaire and it is possible parents may have misreported their child's diagnosis. Additionally, there was no information provided about the type or severity of anxiety disorder.
- The relatively small sample size, particularly for the ASD + anxiety group compared to the ASD only group, limited the power of this study to detect smaller differences between groups.

Future Directions

- It would be interesting to see a study explore how severity of a comorbid anxiety disorder in children with ASD influences repetitive behaviors.
- Additionally, it would be interesting to see a larger study with more power to assess potential sex differences across these groups.
- It would be interesting to see how the relationship between anxiety group and repetitive behaviors changes over time.