**Symposium Title:** Comorbid Anxiety among Individuals with Autism Spectrum Disorder: Symptom Presentation, Risk Correlates, and Treatment Outcomes

**Chair:** Cameron L. Neece

**Discussant:** Jane Roberts

**Overview:** Affecting an estimated 1 in 59 children in the United States, autism spectrum disorder (ASD) is a common neurodevelopmental disorder characterized by persistent deficits in social communication and interaction, as well as restrictive, repetitive behaviors (Baio et al. 2018). Comorbid anxiety within the ASD youth population is well-documented (White et al. 2009), and was in fact reported as early as the first accounts of autism (Kanner 1943). A recent meta-analysis revealed that 39.6% of ASD youth had at least one comorbid anxiety disorder, a number much higher than that seen in typically-developing children (van Steensel et al. 2011). This anxiety is manifested in a few ways, including specific phobias, separation anxiety disorder, generalized anxiety disorder, and panic disorder. The literature has also highlighted the functional impairments associated with comorbid anxiety and ASD, which includes increased stereotyped behavior (Suhrdolsky et al. 2008), poorer social skills (Bellini 2004), and higher rates of self-injury and depression (Kerns et al. 2015). Despite these findings, there is limited research investigating the nature of comorbid anxiety in youth with ASD, in particular its relationship with autism in regards to risk and protective factors, symptom expression, and treatment response. The three presentations in this symposium will evaluate various elements of comorbid anxiety in ASD, such as its prevalence, potential risk factors, impact on treatment outcomes, and its heterogeneous nature within the ASD youth population. The first presentation (Chan) will examine the rates, symptom presentation, and risk correlates of anxiety in preschool-aged children with and without ASD. The second presentation (Rosen) will compare baseline levels of social anxiety in adolescents and young adults prior to social skills treatment in order to examine its potential influence on treatment outcome. Finally, the third presentation (Cho) will utilize a latent profile analysis approach towards personality data to identify homogeneous subgroups within the ASD and comorbid anxiety sub-population. These three papers provide a rigorous and comprehensive examination of anxiety in people with ASD across development. In her role as Discussant, Dr. Jane Roberts will synthesize paper findings and highlight the implications of the presented research with regard to future research and practice.

**Paper 1 of 3**

**Paper Title:** Anxiety in Preschool Aged Children with and without Autism Spectrum Disorder: Rates and Risk Correlates

**Authors:** Neilson Chan, Hadley McGregor, Amanda Preston, Cameron L. Neece

**Introduction:** Children with developmental delays (DD) and autism spectrum disorder (ASD) may be at greater risk for developing comorbid anxiety and internalizing problems compared to their typically developing peers. Studies have shown that rates of anxiety disorders among children with DD and ASD range from 20-65% (Leyfer et al., 2006; Salazar et al., 2015; Simonoff et al., 2008). The elevated rates of anxiety in this population are concerning, given a host of negative outcomes that may exacerbate the risks already associated with ASD, including later psychopathology, poorer adaptive functioning, and academic difficulties (Levy & Perry, 2011). Furthermore, considering the importance of early parenting in predicting child outcomes, researchers have found that specific parenting behaviors (e.g., overcontrolling parenting) may be predictive of anxiety in children with ASD (McLeod et al., 2007). However, few studies have examined the rates and presentation of anxiety among preschool-aged children with ASD, as well as its risk correlates. Additionally, most studies have relied solely on parent-report data, which may be subject to reporting biases. The aims of the current study are: (1) using multiple informants to examine the rates of clinically significantly levels of anxiety in a population of developmentally delayed, preschool-aged children with and without ASD; (2)

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examine the manifestation of anxiety symptoms in this population; and (3) examine whether ASD status moderates the relationship between parenting and child anxiety.

**Methods:** In the current study, we used data from the Mindful Awareness for Parenting Stress (MAPS) Project, which included 99 parents of children with DD, ages 2.5 to 5 years old. These parents participated in a randomized control trial examining the efficacy of Mindfulness-Based Stress Reduction in reducing parenting stress and subsequent child behavior problems. Fifty-six (56.6%) children were reported to have ASD. We utilized multi-method, multi-informant, and multi-setting measures of child and parenting variables. Parents and teachers completed the Child Behavior Checklist for Ages 1½-5 (Achenbach & Rescorla, 2000) and the Teacher Response Form (Achenbach & Rescorla, 2000); we used the DSM-Anxiety scale as a measure of anxiety. Parents also completed the Alabama Parenting Questionnaire Preschool Revision (APQ-PR; Clerkin et al., 2007) as a measure of parenting behaviors. The APQ-PR has the following subscales: Positive Parenting, Inconsistent Parenting, and Punitive Parenting. Families participated in filmed parent-child interactions, which were used as observational measures of parenting (Parent-Child Interaction Rating Scale and Clean-Up Coding System; Belsky et al., 1995; Guisti et al., 1997).

**Results:** Children with ASD in our sample were at a higher risk of having clinically significant levels of anxiety than those without ASD, as evidenced by parent-report (41.1% vs. 18.6%, respectively; \( \chi^2(1) = 5.71, OR = 3.05, p < .05 \)) and teacher-report data (26.9% vs. 9.0%, respectively; \( \chi^2(1) = 2.75, OR = 3.67, p < .10 \)). We also examined the symptom presentation of anxiety in children with and without ASD. Spearman’s rank correlation coefficients on the endorsement frequency of anxiety symptoms for both children with and without ASD were high for both parent and teacher data (\( p = .76 \) and \( p = .80, ps < .05 \), respectively), indicating that symptoms were endorsed at similar relative frequencies within the two groups. Most commonly endorsed symptoms (over 30% of sample) included “doesn’t want to sleep alone,” “clings to adults or too dependent,” and “fears certain animals, situations, or places.” Finally, we conducted a hierarchical regression to examine whether ASD status moderated the influence of parenting behaviors on child anxiety. Results indicated that the Inconsistent Parenting X ASD interaction significantly predicted parent-report anxiety symptoms (\( \beta = 0.42, p < .05 \)). Specifically, for children with ASD, higher levels of inconsistent parenting were predictive of higher levels of anxiety; however, the relationship between inconsistent parenting and anxiety was not significant for children without ASD.

**Discussion:** Results of this study suggest that children with ASD have higher levels of anxiety symptomatology and are at greater risk for developing clinically significant levels of anxiety than children with other developmental delays. The most commonly endorsed symptoms of anxiety were behaviorally based. Due to the population’s young age and ASD diagnosis, it may be more difficult to measure symptoms that reflect the child’s internal mental state. Both parent and teacher data indicate concerning levels of clinical anxiety in this population despite this difficulty, with up to 30% of our sample (with and without ASD) reported to exhibit clinical levels of anxiety. It may be beneficial for future studies to consider how interventions targeting inconsistent parenting may be used in decreasing symptoms of anxiety in children with ASD.

**References/Citations:**


**Paper Title:** Examining the Impact of Anxiety on Treatment Outcome for Teens and Young Adults with Autism Spectrum Disorder and Other Social Impairments

**Authors:** Nicole Rosen³, Morgan Jolliffe³, & Elizabeth Laugeson, PsyD³

**Introduction:** Social neglect and peer rejection strongly predict negative mental health outcomes including anxiety and depression (Buhrmeister 1990; Matson et al. 1998). Extensive research shows that the relationship between autism spectrum disorder (ASD) and anxiety in children and adolescents may be due to increased social isolation resulting from social deficits (Shtayermman 2007; Chalfant et al. 2007; Mitchell et al. 2010; White et al. 2010). Research also suggests that anxiety increases in severity as adolescents with ASD get older, in contrast to the decreasing pattern of anxiety often seen in typically developing adolescents (Sebastian et al. 2009). There is some evidence suggesting that social skills treatment may decrease social anxiety in youth with ASD (Schohl et al. 2013); however, little is known about how social anxiety predicts treatment outcome in social skills training. Moreover, even less is known about how comorbid anxiety may affect adolescents and young adults receiving social skills treatment differently. The purpose of this study is to examine the impact of baseline social anxiety on treatment outcome among adolescents and young adults presenting for social skills treatment.

**Methods:** Participants included 345 adolescents (75.2% male; M=13.79, SD=1.91) and 167 young adults (75.4% male; M=22.28, SD=3.82) with ASD and other social impairments presenting for social skills treatment through the UCLA PEERS Clinic, a 16-week empirically-supported caregiver-assisted group social skills intervention for adolescents and young adults with social challenges (Laugeson & Frankel 2010; Laugeson 2017). To assess baseline adolescent and young adult social anxiety, caregivers completed the Social Anxiety Scale (SAS; La Greca 1999) prior to intervention. Treatment outcome was assessed pre- and post-intervention using caregiver-reported change in social responsiveness on the Social Responsiveness Scale-Second Edition (SRS-2; Constantino 2012). While the SRS-2 is primarily used as an autism diagnostic screening tool, it has been shown to be sensitive to changes in social functioning among youth with ASD following treatment (Wood et al. 2009; Laugeson et al. 2012; Laugeson et al. 2015), and was therefore used as a treatment outcome measure in the current study.

**Results:** Prior to treatment, independent samples t-tests reveal that overall social anxiety on the SAS is significantly greater among young adults (M=61.31, SD=13.55) compared to adolescents (M=50.79, SD=14.20) (p<.05). Treatment outcome was assessed using paired samples t-tests, which revealed significant improvement in overall social responsiveness on the SRS-2 total scores (p<.05) in both adolescents and young adults. In order to assess the impact of baseline social anxiety as a predictor of treatment outcome on the SRS-2, Pearson correlation coefficients were calculated. Among young adults, improvement in overall social responsiveness on SRS-2 total scores was significantly correlated with baseline overall social anxiety on SAS total scores (p=.011), as well as all subscales of the SAS, including Fear of Negative Evaluation (p=.01), Social Avoidance and Distress – New (p=.045), and Social Avoidance and Distress – General (p=.022). However, adolescent baseline social anxiety on the SAS was not correlated with change in SRS-2 total scores following treatment.

**Discussion:** Results suggest that social anxiety among youth seeking social skills treatment may be greater among young adults than adolescents. This finding is consistent with prior research revealing that anxiety increases as socially isolated youth grow older. Additionally, results indicate that levels of social anxiety among young adults, unlike adolescents, predict treatment outcome in social skills training, such that young adults with less baseline social anxiety experience greater improvement in social

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responsive following treatment. This finding may be due to the fact that young adults presenting with greater social anxiety may struggle with completing in vivo homework assignments to practice newly learned skills in natural social settings, thereby decreasing treatment adherence. Given that high levels of social anxiety may limit potential treatment gains for young adults with ASD and other social impairments, future research might investigate the benefit of targeted treatments to decrease social anxiety prior to receiving social skills intervention.

References/Citations:

**Paper Title:** Personality Matters: Identifying Personality Subgroups of Children with Autism Spectrum Disorder and Comorbid Anxiety

**Authors:** An Chuen Cho, Amanda R. Johnson, Kashia Rosenau, Jeffrey J. Wood

**Introduction:** Within the ASD population, there is a great deal of variability in individuals’ symptom severity, verbal and intellectual ability, and comorbid symptoms. Given this heterogeneity, ASD is considered a broad clinical diagnosis that consists of multiple separable syndromes (Tordjman et al., 2017). Past research has yet to reveal valid ASD subtypes with distinct characteristics and underpinnings (Grzadzinski et al., 2013). Even within the sub-population of youth with ASD and comorbid anxiety, symptom expression and severity level can vary from individual to individual. In other fields of psychopathology, the personality five-factor model (FFM) has been used to identify etiologic and developmental pathways of clinical diagnoses (e.g., psychopathy; Patrick et al., 2009). Research has also shown that personality facets in the FFM accounted for 70% of variance in autism trait scores in adults (Schwartzman et al., 2016). By evaluating personality profiles within the ASD population, it may be possible to reveal homogeneous subgroups that each possess specific ASD symptoms and etiological causes. The current study proposes to identify distinct personality subgroups within youth with ASD and comorbid anxiety through the FFM and statistical application of latent profile analysis (LPA).

**Methods:** This study utilized secondary data of 202 children with ASD and comorbid anxiety that participated in a 3-site, randomized controlled trial (RCT) for a cognitive-behavioral therapy (CBT) intervention. Parents completed the Hierarchical Personality Inventory for Children (HiPIC), a FFM questionnaire which identified their children’s personality profiles along 18 facets. An LPA was conducted using the sample’s HiPIC scores. A combination of statistical and theoretical considerations drawn from the literature was used to determine the best fitting model. Predictive validity was assessed by comparing subgroups’ treatment response to CBT.

**Results:** Results indicate that a five-class solution best fit the data with significant reductions in the BIC and SBIC through five classes. The BLRT was significant (p < 0.001) up to the five-class solution, but the test was non-significant for the six-class solution (p = 0.208). A Bayes Factor comparison between the five- and six-class solutions provided strong evidence that the five-class solution presented superior fit (BF value > 150). Groups 2 and 3 each represented over a third of the sample, while Groups 4 and 5 both represented less than 10% of the sample individually. There were no instances in which all five personality subgroups shared the same ranking for a particular facet, and an overall inspection of the personality profiles highlighted the five subgroups’ uniqueness. Treatment response to CBT significantly differed between the five identified subgroups.

**Discussion:** To our knowledge, this is the first study to examine personality subgroups within children with ASD and comorbid anxiety. Despite the clinical anxiety characterized by the sample, the five identified personality subgroups varied in their neuroticism level. Remarkably, Group 5 demonstrated normative levels of neuroticism despite their clinical anxiety. It is probable that this subgroups’ anxiety is specific and limited (e.g., specific phobias) and could possess distinct underpinnings. Similar to the identification of multiple etiological pathways in the psychopathy literature, by applying a bottom-up approach in examining ASD phenotypes through the lens of personality, this research may be able to build towards a conceptual model of the autisms and identify valid subtypes of ASD in which all members of a subgroup are more likely to share etiological causes, ASD symptom expression, similar life trajectories, and perhaps even response to particular treatments. The next step in this line of inquiry is to replicate personality subgroup findings in other samples and to further validate the meaningfulness of these subgroups.

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References/Citations: