



Parent Emotion Socialization in Children with Autism Spectrum Disorder and Co-Occurring Anxiety

Rebecca Jordan¹ · Carla B. Kalvin¹ · Karim Ibrahim¹ · Denis G. Sukhodolsky¹

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Abstract

Although parents' socialization of children's emotional experiences and expression has been widely studied in typically developing (TD) populations, these processes have been largely unexplored in families of children with autism spectrum disorder (ASD). The present study examined parent emotion socialization in a well-characterized sample of verbally fluent children with ASD and comorbid anxiety disorders. Participants included 64 children, aged 8–15 years, who had ASD and co-occurring anxiety and 24 matched TD children without psychiatric disorders. Parents completed ratings of their responses to their children's emotional experiences using the Coping with Children's Negative Emotions Scale (CCNES), and both parents and children completed ratings of child anxiety using the Multidimensional Anxiety Rating Scale (MASC). Parents of children with ASD and anxiety did not differ from parents of TD children without psychiatric disorders in their endorsement of different emotion socialization practices. However, among children with ASD and anxiety, greater anxiety was associated with more emotion-focused responses from parents, and for children with less ASD symptom severity, lower levels of anxiety were associated with more punitive responses from parents. Results suggest that certain types of more directive emotion socialization approaches may be associated with lower anxiety in children with ASD, whereas emotion socialization approaches focused on altering the child's emotional experiences may be associated with greater anxiety in this population. While it is likely that parent emotion socialization practices impact children's emotional experiences of anxiety, it is also likely that children with distinct profiles of anxiety and ASD symptomology elicit specific styles of emotion socialization from parents.

During childhood, parents play a critical role in shaping their children's understanding, experience, and expression of emotions (Eisenberg et al. 1998). For children with autism spectrum disorder (ASD) who commonly experience difficulty with emotional understanding and demonstrate marked difficulties with emotion regulation (Mazefsky et al. 2014), parent coaching of their children's emotional experiences is a particularly relevant process. However, shockingly little is understood about parent socialization of emotions in this population. In contrast, the effects of parent emotion socialization in typically developing (TD) children have been well studied (Malatesta and Haviland 1982; Gottman et al. 1997; Eisenberg et al. 1998). Given the high prevalence of

emotional difficulties, such as anxiety, in children with ASD (South et al. 2017; Lai et al. 2019), better understanding parents' emotional socialization of children on the autism spectrum is a priority.

Research conducted with typically developing children suggests that the ways in which parents react to their children's emotional experiences, as well as how they express and regulate their own emotions, influence the development of children's understanding, experience, expression, and regulation of their emotions in a process known as emotion socialization (Eisenberg et al. 1998; Sanders et al. 2015). These parenting responses can both confer risk for maladaptive behaviors and support socioemotional competence. For example, non-supportive responses, such as inconsistent or harsh disciplining and excessive parental control, are associated with children's emotional avoidance, disruptive behavior, and internalizing problems (Kawabata et al. 2011; Weiss et al. 1992; Caron et al. 2006; Wood et al. 2003; Leerkes et al. 2009). Supportive reactions, on the other hand, such as positive affect and parental sensitivity, are associated

✉ Rebecca Jordan
rebecca.jordan@yale.edu

Denis G. Sukhodolsky
denis.sukhodolsky@yale.edu

¹ Child Study Center, Yale University School of Medicine,
230 S. Frontage Road, New Haven, CT 06520, US

with children's successful emotion decoding and appropriate, non-aggressive displays of anger (Barber et al. 2005; Finkenauer et al. 2005; Fabes et al. 2002; Eisenberg et al. 1996).

Little research has investigated parents' emotion socialization of children with ASD. Of the work that has been conducted to date, much of it has focused on very early processes of parent–child communication, including joint attention (Dawson et al. 2004), gaze-sharing (Leekam et al. 1998), and joint engagement (Gulsrud et al. 2010) in preschool-aged children. Observations of parent–child dyads have suggested that mothers of children with ASD may use more simple tactics, physical interaction, and less complex verbal approaches to communicate with their children than parents of TD children (Doussard-Roosevelt et al. 2003; Hirschler-Guttenberg et al. 2015).

Several studies have examined parenting style, and particularly punitive parenting, in children with ASD, however findings in this area are mixed. While some studies report that parents of children with ASD are more directive and controlling than parents of TD children (Kasari et al. 1988; Little 2002), other studies have shown that parents of children with ASD engage in less punishment and set fewer rules (Lambrechts et al. 2011), and yet others show no difference in rates of punitive parenting at all (Maljaars et al. 2014; Ventola et al. 2017).

Core deficits in ASD may also affect the way in which parents engage in certain other parenting practices and emotion socialization strategies with their children. For example, limitations in emotional awareness and deficits in social communication may hinder the ability of children on the spectrum to engage in conversations about their emotions (Wood and Gadow 2010). As such, parents of children with ASD may be less inclined to initiate conversations with their children about their emotions in hopes of helping them process and manage challenging emotional experiences. However, the way in which such emotion socialization practices might differ in families of children with ASD remains largely unknown.

Compounding the lack of research in this area, very few studies have focused on the link between parent emotion socialization and/or parenting practices and common emotional difficulties, such as anxiety, in children with ASD. This is a critical area of research, however, as anxiety affects a disproportionate number of children with ASD and is one of the most common reasons parents seek mental health referrals for their children on the spectrum (Skokauskas and Gallagher 2012). 40% of children with ASD meet criteria for at least one anxiety disorder (van Steensel et al. 2011), and as many as 84% experience subclinical anxiety symptoms (White et al. 2009). In addition to exacerbating core symptoms of ASD, such as deficits in social communication and restricted and repetitive behaviors, anxiety can

trigger irritability and disruptive behavior, and contribute to impairment in adaptive functioning (Canitano 2006; Duvetkot et al. 2018; Hallet et al. 2013). While the association between parenting practices and anxiety has been addressed in TD children with anxiety disorders (e.g., McLeod et al. 2007), only two studies addressed the question of parenting anxious children with ASD. Ting and Weiss (2017) did not find an association between parenting strategies and child internalizing problems. Ventola et al. (2017) compared the parenting practices of parents of anxious children, parents of TD children, and parents of children with ASD and reported that parents of anxious children used more firm control and parental acceptance than the other parents, who did not differ from each other in these practices. However, no studies have examined parent emotion socialization in parents of children with ASD and comorbid anxiety.

Although parent emotion socialization and its link to childhood emotion difficulties, such as anxiety, has been studied in TD populations (Williams and Woodruff-Borden 2015), the topic of emotion socialization has been largely neglected in studies of children with ASD. Further, studies examining patterns of related parenting practices, such as punitive parenting, have been inconsistent, and these studies have neglected to examine potential contributions of age, level of functioning, and ASD symptom severity. For example, while Feldman and colleagues (2019) reported an association between parent accommodation and increased restricted repetitive behaviors, few other studies on parenting practices have assessed ASD symptom severity. It is possible that there are significant associations between these clinical characteristics and of co-occurring disorders, such as anxiety, on parenting that have not been considered.

Present Study

The present study addresses these gaps in the literature by examining parent emotion socialization in a well-characterized sample of verbally fluent children with ASD and comorbid anxiety disorders (ASD + Anxiety). We also included a control group of TD children without any psychiatric disorders. Our first aim was to compare parent emotion socialization practices in the two groups utilizing the Coping with Children's Negative Emotions Scale (CCNES) (Fabes et al. 1990), which categorizes parent responses to children's emotions as supportive (emotion-focused, problem-focused, expressive encouragement) and non-supportive (minimization, punitive). We predicted that, compared to parents of TD children, parents of children with ASD + Anxiety would report less expressive encouragement aimed at validating and discussing their children's emotional experiences, as existing research suggests that parents of children with ASD engage in less verbally sophisticated interactions with

their children (Doussard-Roosevelt et al. 2003; Hirschler-Guttenberg et al. 2015). In addition, expressive encouragement may be limited in this group as deficits in emotional awareness and social communication in children with ASD may limit parents' willingness to engage with them in conversations about their emotions. We also predicted more problem-focused responses from parents of children with ASD + Anxiety, as these parents might have to provide their children with more guidance and scaffolding to help them respond adaptively in emotionally challenging situations (Howlin 1998). However, given the sparse and inconsistent research on parent emotion socialization practices in ASD, we had no a priori hypotheses regarding differences between the two groups in the other types of parent responses.

Our second aim was to explore associations of the different parent emotion socialization practices with child anxiety, as well as with age, gender, and IQ, in the ASD + Anxiety group. As the literature on different parenting responses in ASD is mixed, particularly the literature on punitive responses, and has rarely looked at associations with anxiety, we did not have a priori hypotheses regarding the associations between different parent responses and anxiety in the ASD + Anxiety group.

Given the potential association of punitive responses with child emotional reactions, the third aim was focused on the punitive subscale of the CCNES. Specifically, we conducted an exploratory analysis to examine the contributions of anxiety and ASD symptom severity to parents' punitive emotion socialization responses in a group of children with ASD + Anxiety. In addition, we investigated potential interactive effects of anxiety and ASD symptom severity on punitive responses.

Methods

Participants

Participants included 88 children (aged 8–15 years) (63 males, *Mean* age = 12.00, *SD* = 1.74) comprised of two groups: 64 carefully characterized children with ASD and co-occurring anxiety disorders (48 male, *M* age = 11.93, *SD* = 1.72) and 24 TD healthy controls (15 male, *M* age = 12.14, *SD* = 1.80). Children with ASD were recruited from the Yale Child Study Center Autism Program as part of the clinical trial of behavioral therapy for anxiety in autism. This paper reports the baseline data (i.e., data collected before children received study interventions). TD children were recruited from the local community and included if they had never received a diagnosis of a psychiatric or developmental disorder and had never received special education services. All children were required to have a full-scale IQ

score ≥ 65 . Participant demographics and clinical characteristics are shown in Table 1.

Procedures

Diagnosis of ASD was based on the Autism Diagnostic Interview-Revised (ADI-R) (Le Couteur et al. 2003) and the Autism Diagnostic Observation Schedule, 2nd edition (ADOS-2) (Lord et al. 2012), which were administered by a research-reliable clinician. In addition to a confirmed diagnosis of ASD, children in the ASD + Anxiety group were required to meet DSM-5 criteria for at least one anxiety disorder. Co-occurring psychiatric disorders were assessed using the Anxiety Disorders Interview Schedule for Children and Parents (ADIS-C/P) (Silverman and Albano 1996), also by an expert clinician. For children in both groups, the Differential Ability Scales-II (DAS-II) (Elliott 2007) was used to measure Full Scale IQ. Children in the study had Full Scale IQ scores ranging from 66 to 155 (mean = 103.45, *SD* = 20.08). Parents of all children provided demographic and medical history information and completed questionnaires regarding autism severity, children's symptoms of anxiety, and parent responses to children's emotional and behavioral challenges. Parents provided written informed consent and children provided written assent. All study procedures were approved by the Yale University School of Medicine Institutional Review Board and complied with ethical standards of the American Psychological Association.

Measures

ADOS-2. The ADOS-2 (Lord et al. 2012) was used to support ASD diagnosis. The ADOS-2 is a clinician-administered observational assessment that evaluates ASD symptomatology and diagnoses ASD using a combination of unstructured conversations, structured activities, and interview questions. All ADOS-2 administrations in this study were conducted with Module 3, appropriate for verbally fluent children. The ADOS-2 Module 3 algorithm yields subscale scores in the domains of Social Affect (SA) and Restricted and Repetitive Behavior (RRB), in addition to a Total Score, which can be used to establish classification as autism, autism spectrum, or non-spectrum. While the ADOS-2 can also be used to assess ASD symptom severity, with higher scores indicating greater severity, it is primarily a diagnostic instrument, and it is less sensitive to detecting correlations with other measures. In the current paper, the SRS-2 was used to measure ASD symptom severity because it is a dimensional measure that better captures a wide range of behavioral difficulties.

ADI-R. The ADI-R (Le Couteur et al. 2003) is a clinician-administered semi-structured interview conducted with

Table 1 Participant Demographics and Clinical Characteristics

	ASD + Anxiety (<i>n</i> = 42)	TD (<i>n</i> = 18)	<i>p</i> value
Age, Mean (SD)	11.93 (1.72)	12.14 (1.80)	.63
Sex, Number (%)			.25
Male	48 (75)	15 (62.5)	
Race, Number (%)			.14
Asian	4 (6.3)	1 (4.2)	
Black or African American	2 (3.1)	4 (16.7)	
White	52 (81.3)	16 (66.7)	
More than one race	6 (9.4)	3 (12.5)	
Ethnicity, Number (%)			.26
Hispanic or Latino	15 (23.4)	3 (12.5)	
Not Hispanic or Latino	49 (76.6)	21 (87.5)	
Full Scale IQ, Mean (SD)	100.05 (21.15)	111.96 (14.19)	<.01 ^{ab}
CCNES, Mean (SD)			
Emotion-Focused	5.30 (1.02)	5.22 (.82)	.70
Problem-Focused	5.62 (.93)	5.83 (.81)	.33
Expressive Encouragement	4.84 (1.18)	4.93 (1.45)	.78
Minimization	2.20 (.89)	2.50 (.73)	.14
Punitive	1.96 (.61)	2.13 (.73)	.26
MASC-2 Parent-Reported Anxiety, Mean (SD)	68.66 (15.28)	43.21 (4.49)	<.001 ^{ac}
MASC-2 Child-Reported Anxiety, Mean (SD)	62.14 (11.97)	48.63 (7.29)	<.001 ^{ac}
SRS-2, Mean (SD)	75.36 (8.76)		
ADOS-2, Mean (SD)			
SA	10.36 (3.33)		
RRB	2.27 (1.66)		
Total	12.63 (4.00)		
ADI-R, Mean (SD)			
A	21.92 (5.32)		
B	16.37 (4.60)		
C	7.10 (2.53)		
DSM-5 diagnoses, Number (%)			
Anxiety disorder	64 (100.0)		
Generalized anxiety disorder	39 (60.9)		
Social anxiety disorder	38 (59.4)		
Specific phobia	21 (32.8)		
Separation anxiety	9 (14.1)		
Obsessive compulsive disorder	6 (9.4)		
Oppositional defiant disorder	12 (18.8)		
Conduct Disorder	1 (1.6)		
Attention-deficit/hyperactivity disorder	35 (54.7)		
Depressive disorder	6 (9.4)		
Taking psychiatric medication, Number (%)			
Stimulants	14 (21.9)		
Alpha Agonists	13 (20.3)		
Antidepressants	6 (9.4)		
Neuroleptics	5 (7.8)		
Mood Stabilizers	1 (1.6)		
Benzodiazepines	2 (3.1)		

ASD + Anxiety = ASD and comorbid anxiety, TD = Typically developing healthy controls, CCNES = Coping with Children's Negative Emotions Scale, MASC-2 = Multidimensional Anxiety Scale for Children, 2nd edition, SRS-2 = Social Responsiveness Scale, 2nd edition, ADOS-2 = Autism Diagnostic Observation Schedule-2nd edition, ADOS-2: SA- Social affect, RRB- Restricted and repetitive behavior, ADI-R = Autism Diagnostic Interview-Revised, ADI-R: A- Qualitative abnormalities in reciprocal social interaction, B- Qualitative abnormalities in communication, C- Restricted, repetitive, and stereotyped patterns of behavior, Full-scale IQ measured by the Differential Ability Scales-II

Table 1 (continued)^aSignificant group differences at $p < .05$ ^bTD > ASD + Anxiety^cASD + Anxiety > TD

the child's caregiver and used to assist with the diagnosis of ASD. The items on the ADI-R are scored based on the caregiver's responses to questions about the child's current and lifetime functioning. The ADI-R algorithm yields total scores in the following areas: Qualitative Abnormalities in Reciprocal Social Interaction, Qualitative Abnormalities in Communication, and Restricted, Repetitive, and Stereotyped Patterns of Behavior (RRB).

ADIS-C/P. The ADIS-C/P (Silverman and Albano 1996) is a structured diagnostic interview conducted by a clinician with both child and parent and is considered to be the gold-standard tool for identifying the presence of specific anxiety disorders in children. The independent child and parent interviews are organized diagnostically to allow for differential diagnoses among all of the DSM-IV anxiety disorders. The ADIS-C/P assesses generalized anxiety, separation anxiety, social phobia, specific phobia, panic disorder, and agoraphobia, in addition to a number of co-occurring disorders (e.g. ADHD, OCD, PTSD) and problem behaviors (e.g. school refusal). When there are differences between parent and child reports, clinicians use their clinical judgment to elicit information necessary to confirm diagnosis.

DAS-II. Full Scale IQ was measured using the DAS-II (Elliott 2007). Children completed six subtests in the School-Age battery for children ages 7 to 18: Verbal Similarities, Word Definitions, Matrices, Sequential and Quantitative Reasoning, Recall of Designs, and Pattern Construction. Their performance on these subtests was used to calculate Verbal, Nonverbal Reasoning, and Spatial cluster scores, as well as a Global Cognitive Ability composite score. In this study, each child's Global Cognitive Ability composite score was used as an estimate of his/her Full Scale IQ.

CCNES. Parent emotion socialization was measured using the CCNES (Fabes et al. 1990). The CCNES is a parent-rated instrument that presents parents with 12 scenarios in which their children may experience negative emotions including anger, anxiety, embarrassment, and disappointment. These hypothetical situations represent common emotionally evocative events that children are exposed to (e.g., "my child loses a prized possession and reacts with tears," "my child is about to appear in a recital or sports activity and becomes visibly nervous about people watching him/her"). For each of these scenarios, six possible parent reactions are provided, each of which correspond to one of the following types of parent responses: Emotion-Focused Reactions, Problem-Focused Reactions, Expressive Encouragement, Minimization Reactions, Punitive Reactions, and Distress Reactions. Parents rate their likelihood of responding

in each of the six ways on a 7-point Likert-scale from 1 (very unlikely) to 7 (very likely), and ratings are used to calculate six subscales that represent each of the different response types. Higher scores on each of the subscales indicate greater levels of that type of parent response. For this paper, we focused on the first five types of parent responses, which represent different types of parent emotion socialization practices. We did not include Distress Reactions in our analysis because this subscale measures parents' own emotional experiences rather than their attempts to coach or modulate their children's experiences and thus does not represent a direct emotion socialization strategy.

The Problem-Focused Reactions subscale reflects the degree to which parents help the child solve the problem at hand (e.g., "help my child think of constructive things to do when other children tease him/her"). The Emotion-Focused Reactions subscale reflects the degree to which parents attempt to refocus the child away from his/her negative feelings and feel better (e.g., "comfort my child and get him/her to think about something happy"). The Expressive Encouragement subscale captures the degree to which parents validate the child's emotional experience or encourage his/her expression of negative affect (e.g., "encourage my child to talk about his/her nervous feelings"). These three responses comprise the "supportive" parent responses. Punitive and Minimization Reactions, on the other hand, are categorized as "non-supportive" parent responses. The Punitive Reactions subscale represents the degree to which parents use punishment to control the expression of negative emotion (e.g., "tell my child to go to bed or he/she won't be allowed to watch any more TV"). The Minimization Reactions subscale reflects the degree to which parents diminish the seriousness of the situation or problem or devalue the child's emotional response (e.g., "tell my child that he/she is over-reacting").

The CCNES has been used widely in parenting research in TD samples (Eisenberg and Fabes 1994; Coutu et al. 2002; Nelson et al. 2012; Lins et al. 2017). The CCNES has been used less frequently in ASD samples, however, and has been extended and modified in various ways when used, with scenarios added or subscales combined (Bougher-Mucklan et al. 2016, 2019). Although they can be categorized as supportive and non-supportive, psychometrics reveal that the six subscales do not represent a linear continuum from positive to negative parental reactions (Fabes et al. 2002). Instead, they represent distinct parenting behaviors. The current study uses the original version of the CCNES in order to maintain this specificity. The CCNES has good

internal reliability, ranging from $\alpha = 0.69$ for the Punitive Reactions subscale to $\alpha = 0.85$ for the Expressive Encouragement subscale. In the current study, the CCNES also showed good internal consistency ($\alpha = 0.69$ for Punitive Reactions; $\alpha = 0.81$ for Minimization Reactions, $\alpha = 0.85$ for Emotion-Focused Reactions, $\alpha = 0.87$ for Problem-Focused Reactions, $\alpha = 0.92$ for Expressive Encouragement Reactions).

MASC-2. The Multidimensional Anxiety Scale for Children, 2nd edition (MASC-2) (March 2012) is a 50-item scale that assesses anxiety symptoms in children and adolescents. In the current study, both parent report and child self-report versions were used. Items on the MASC-2 are rated on a 4-point scale ranging from 0 (never) to 3 (often), with higher scores reflecting greater anxiety symptomatology. Parents and children are asked to rate, for example, how often the child “worries about getting called on in class,” “avoids going places without the family,” and “keeps the light on at night.” The MASC-2 consists of 10 subscales and a Total Anxiety scale and yields *T*-scores based on child age and gender, with *T*-scores ≥ 65 indicating elevated levels of anxiety. The MASC-2 shows excellent internal consistency for children with ASD in both parent report ($\alpha = 0.92$) and child self-report ($\alpha = 0.90$) (Kaat and Lecavalier 2015). Both parent report and child self-report had excellent internal consistency in the current total sample ($\alpha = 0.95$ and $\alpha = 0.93$, respectively), as well as within the ASD + Anxiety ($\alpha = 0.93$ and $\alpha = 0.91$) and TD groups ($\alpha = 0.84$ and $\alpha = 0.88$).

SRS-2. The Social Responsiveness Scale (SRS-2) (Constantino and Gruber 2012) is a 65-item scale that assesses the severity of social impairment associated with ASD, as outlined by the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association 2000). Items on the SRS-2 are rated by parents on a 4-point scale ranging from 1 (not true) to 4 (almost always true), with higher scores reflecting greater social deficits. Parents are asked to rate, for example, whether their child “plays appropriately with children his/her age” and “thinks and talks about the same thing over and over.” Results are reported as *T*-scores ($M = 50$, $SD = 10$) based on child gender for the treatment subscales (Social Awareness, Social Cognition, Social Communication, Social Motivation, and Restricted Interests and Repetitive Behavior) and the overall total score. *T*-scores ≥ 60 indicate mild to moderate social deficits, and *T*-scores ≥ 76 suggest severe social deficits. The SRS-2 has demonstrated strong internal consistency in school-age children with ASD ($\alpha = 0.95$) and showed excellent internal consistency in the current sample ($\alpha = 0.91$ in ASD + Anxiety group).

Data Analyses

To examine group differences in demographic and clinical characteristics, *t*-tests and chi square tests were conducted

with Bonferroni adjustments to correct for multiple comparisons. *T*-tests were also conducted to examine group differences in CCNES subscale scores. Next, to explore the association of children’s anxiety severity with parent emotion socialization, as well as with demographic and clinical characteristics, we conducted zero-order correlations between the six CCNES subscale scores, MASC-2 total scores from both parent and child self-report, age, gender, IQ, and ASD symptom severity (measured by the SRS-2). These correlations were conducted in the ASD + Anxiety group only. We conducted this correlational analysis in an exploratory fashion, without controlling for the probability of Type 1 error. The purpose of this analysis was to explore possible associations among these variables for researchers who may be planning to use this measure in future studies. Lastly, to explore the contributions of ASD symptom severity and anxiety to parents’ punitive responses, a hierarchical linear regression predicting CCNES Punitive Reactions score in the ASD + Anxiety cohort was conducted. Controlling for age, gender, IQ, the unique, combined, and interactive effects of ASD severity and child self-reported anxiety were examined. We used the child-self report version of the MASC-2 (rather than the parent-rated MASC-2) to examine associations between parent emotion socialization and anxiety in order to minimize the risk of inflating associations due to shared methods variance. All analyses were conducted using SPSS v24 (IBM corp. 2016).

Results

Demographic and clinical characteristics of the sample are reported in Table 1. There were no significant differences in age, gender, race, or ethnicity between the TD and ASD + Anxiety groups. There were significant differences in Full Scale IQ, with higher scores in the TD group ($M = 111.96$, $SD = 14.19$) versus ASD + Anxiety group ($M = 100.05$, $SD = 21.15$), $p < 0.01$. As expected, both parent reported and child self-reported MASC-2 total *T*-scores were significantly higher in the ASD + Anxiety group (parent $M = 68.66$, $SD = 15.28$; child $M = 62.14$, $SD = 11.97$) than in the TD group (parent $M = 43.21$, $SD = 4.49$; child $M = 48.63$, $SD = 7.29$), $p_s < 0.001$.

Mean and SD values of CCNES subscales for both groups are reported in Table 1. There were no significant differences in TD and ASD + Anxiety parents’ endorsement of any of the five types of parent responses, $p_s > 0.14$. With regard to the associations between parent emotion socialization practices and children’s anxiety, demographic, and clinical characteristics in the ASD + Anxiety group, the strongest association and one that would have remained significant with a Bonferroni correction was a moderate positive association between emotion-focused responses and parent-rated

child anxiety ($r=0.44, p<0.001$). The other uncorrected correlations included a small negative association between minimization responses and child self-reported anxiety ($r=-0.27, p<0.05$) and a positive association between problem-focused responses and parent-rated child anxiety ($r=0.32, p=0.01$). Age and IQ were not associated with parenting responses, but there was a small correlation between gender and expressive encouragement in ($r=0.30, p<0.05$), with parents of boys reporting more expressive encouragement than parents of girls. These correlations are reported in Table 2. With regard to associations among the subscales of the CCNES, the three types of supportive parent responses (expressive encouragement, problem-focused, and emotion-focused) were positively associated with one another, and the two non-supportive parent responses (punitive and minimization) were positively associated.

The hierarchical linear regression predicting punitive reactions in the ASD + Anxiety group was conducted in three steps. To control for heterogeneity conferred by age, gender, and IQ, these variables were entered in the first step. To examine the unique and combined contributions of anxiety and ASD symptom severity to parents’ punitive reactions, child self-reported anxiety and ASD symptom severity (measured by the SRS-2) were entered into the second step. Lastly, to examine potential interactive effects, the interaction between anxiety and ASD symptom severity was entered into the third step. The results of these analyses are presented in Table 3. In step one, controlling for age and IQ, gender was significant, with parents of boys responding more punitively than parents of girls ($\beta=0.28, p<0.05$). After accounting for age, gender, and IQ, anxiety and ASD symptom severity entered as a block did not account for additional variance in punitive reactions. However, when included together in this step, there was a unique contribution of anxiety ($\beta=-0.28, p<0.05$), with anxiety negatively predicting punitive reactions, but there was no unique contribution of ASD symptom severity ($\beta=-0.02, p=0.87$). When tested in the third step, the interaction between anxiety and ASD symptom severity was significant ($\beta=1.59, p<0.05$), accounting for an additional 8% of the variance in parent punitive responses. This interaction is graphically depicted

Table 3 Hierarchical Regression Analysis of Parent Punitive Responses as a Function of Child Self-Reported Anxiety and ASD Symptom Severity in ASD + Anxiety Group ($n=64$)

Variable	R^2	β	ΔF
Step 1	.09		1.74
Age		-.04	
Gender		.28*	
IQ		.16	
Step 2	.16		2.40
Anxiety		-.28*	
ASD Severity		-.02	
Step 3	.24		5.53*
Anxiety x ASD Severity		1.59*	

* $p<.05$. *** $p<.001$

in Fig. 1. For children with low levels of ASD symptom severity, higher levels of anxiety contributed to less punitive parenting. In contrast, for children with high levels of ASD symptom severity, anxiety was not associated with levels of parents’ punitive reactions. Overall, the highest levels of punitive parenting were found for children with low ASD symptom severity and low anxiety. Together, these results signify that while higher levels of child anxiety are associated with less punitive parent responses for children with lower ASD symptom severity, for children with higher ASD symptom severity, parents engage in less punitive responses and these responses are generally unaffected by children’s level of anxiety.

Discussion

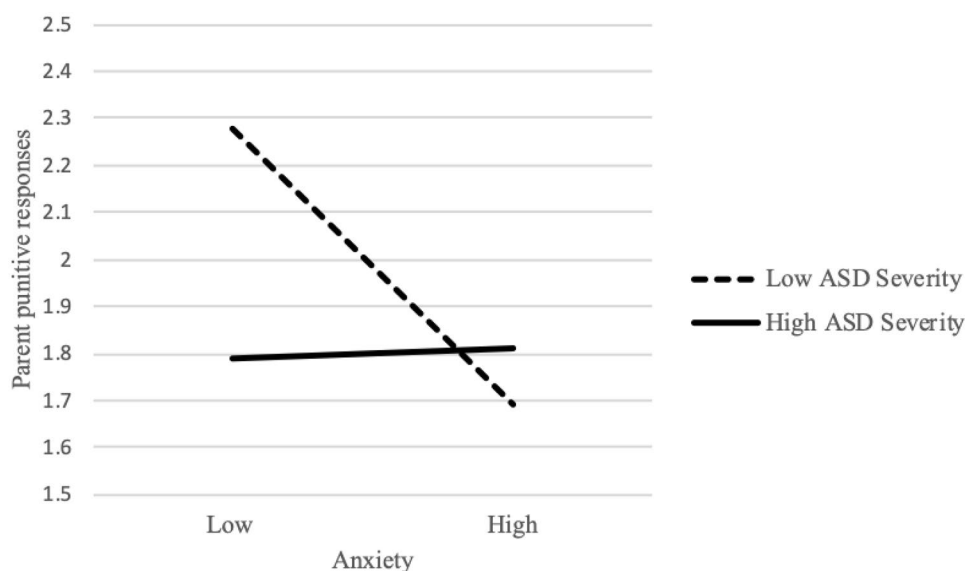
The present study examined parent emotion socialization in a well-characterized sample of verbally fluent children with ASD and comorbid anxiety disorders. Our first aim was to compare parent emotion socialization practices in parents of ASD + Anxiety children to those of TD children utilizing the CCNES. Contrary to our expectations, we found no differences in parent responses between the two groups.

Table 2 Correlations Among Age, Gender, IQ, Anxiety and Parent Emotion Socialization Responses in the ASD + Anxiety group ($n=64$)

	Expressive Encouragement	Emotion-Focused	Problem-Focused	Punitive	Minimization
Age	-.03	-.06	.01	-.12	-.23
Gender	.30*	.20	.09	.20	.14
Full Scale IQ	-.11	-.24	-.11	.10	.15
Parent-rated anxiety	.20	.44***	.32*	-.19	-.14
Child self-reported anxiety	-.03	.06	.03	-.23	-.27*

* $p<.05$; ** $p<.01$; *** $p<.001$

Fig. 1 Parent punitive responses as a function of the interaction between child self-reported anxiety and ASD symptom severity in the ASD + Anxiety group ($n = 64$). Anxiety and ASD symptom severity dichotomized using a median split



Previous studies of younger, preschool-aged children suggest that parents of children with ASD engage in less complex verbal interactions with their children than parents of TD children (Doussard-Roosevelt et al. 2003; Hirschler-Guttenberg et al. 2015). Yet, in our sample, parental expressive encouragement, which typically involves parents' use of more complex, emotion-focused language, was comparable for parents of children with ASD and parents of TD children. This difference in findings may be attributable to the lower language abilities of preschoolers with ASD relative to the older, verbally fluent children in our study. Specifically, whereas the language limitations of young children with ASD may cause parents to engage in less complex verbal interactions, this is less likely to be true for children with ASD who have more sophisticated language skills. Parents of these children may be more likely to engage with them in verbally complex conversations, such as conversations involving expressive encouragement, and they may do so at rates comparable to parents of TD children. However, for school-aged children with ASD who are *not* verbally fluent, we might expect to see reduced rates of parent engagement in expressive encouragement and less complex verbal interactions in ways more similar to parents of preschool-aged children with ASD.

In addition, despite generally higher levels of emotion dysregulation in children with ASD (Mazefsky 2015), the present findings suggest that parents of children with ASD do not engage in emotion socialization patterns in manner qualitatively or quantitatively different than parents of TD children. It may be that, despite more frequent or intense manifestations of emotional distress in children with ASD, parents of both ASD and TD children respond similarly, perhaps more influenced by their child's level of emotional distress relative to him or herself, rather than

absolute levels of emotion dysregulation or distress. With regard to punitive forms of emotion socialization, these findings of no differences between the ASD and TD groups are consistent with prior studies documenting no differences in rates of punitive parenting styles in ASD versus TD children (Maljaars et al. 2014; Ventola et al. 2017).

Our second aim was to examine associations of the different parent emotion socialization practices with child anxiety, as well as with age, gender, and IQ, in the ASD + Anxiety group. For this set of analyses, we conducted uncorrected correlations for exploratory purposes. The strongest association and one that would have remained significant with a Bonferroni correction was a positive association between emotion-focused parent socialization practices and child anxiety, indicating that higher levels of emotion-focused practices were associated with heightened anxiety. While emotion-focused socialization practices are generally regarded as supportive and helpful, it may be that for children with anxiety and ASD, extended attempts to make the child feel better and refocus him or her away from negative feelings may exacerbate anxiety more than alleviate it. First, for a child with heightened anxiety, continued parental attempts to comfort the child, often in the form of reassurance, are likely to reinforce and ultimately increase anxiety and anxious behavior (Kagan and Kendall 2017). In addition, for a child with ASD who perseverates on thoughts and ideas, trying to refocus negative thoughts in the moment may prove particularly challenging and thus exacerbate feelings of anxiety and agitation. However, in light of the likely reciprocal relationship between child behaviors and parenting behaviors (Burke et al. 2008; Bell 1979), it is also plausible that children with higher levels of anxiety elicit higher rates of emotion-focused responding from parents

who use these strategies as a way to try to comfort their children and help them manage their difficult emotional experiences.

In the ASD + Anxiety group, two other correlations emerged as significant when unadjusted for Type I error. Given the paucity of research on parental emotion socialization in autism we decided to report these associations in this paper to stimulate hypotheses testing in future studies. First, there was a positive association between problem-focused socialization practices and anxiety. While problem-focused practices are typically viewed as supportive, it may be that for children on the spectrum with impaired social communication abilities, extended conversations aimed at problem-solving result in frustration and serve to heighten anxiety more than reduce it. Second, there was a negative association between minimization socialization practices and anxiety. While minimization is often regarded unfavorably, it is plausible that for a child with ASD, receiving a direct statement aimed at facilitating the child's reduction of emotional arousal (e.g., "You'll feel better soon," "Don't make a big deal out of it") is more useful than approaches that are less literal and may be more confusing.

Our final aim of the study was to further explore the potential effect of child anxiety and ASD symptom severity on parent punitive emotion socialization practices, and particularly examine whether the association between punitive emotion socialization practices and child anxiety was moderated by ASD symptom severity. Results indicated that for children with high levels of ASD symptom severity, levels of anxiety were not associated with punitive parenting. In contrast, for children with low levels of ASD symptom severity, higher levels of anxiety were associated with less punitive parenting. This set of findings indicates that the way in which anxiety may impact punitive parenting may be specific to children with less severe ASD symptomatology. That is, for children with less pronounced ASD symptoms but higher anxiety, parents may be more inclined to respond to their children's negative emotions carefully and thus respond in less punitive ways. However, for children low in anxiety and low in ASD symptom severity, parents may not worry as much about using these non-supportive strategies, due to less concern regarding the intensity and potential consequences of their children's experience of negative emotions. As such, they may be more likely to respond in a punitive manner. Parents may also respond more punitively to children with low ASD severity and low anxiety because they have higher expectations for these children's behavior or are simply not used to seeing them emotionally distressed. Parents may misinterpret this distress as "naughty behavior."

In contrast, parents of children with high ASD symptom severity may be especially cognizant of their emotional and social challenges and thus respond less punitively to their children's everyday emotional reactions, regardless of

the child's overall levels of anxiety. This finding of lower levels of punitive parent emotion socialization in children with higher levels of ASD symptom severity is consistent with previous research documenting an association between ASD symptomatology and more supportive parent emotion socialization styles (Bougher-Mucklan et al. 2016).

Further, regarding the negative association between punitive parenting and anxiety in children with low ASD symptom severity, it is also possible that high parental control and strategies that may be associated with more punitive styles of parent responding, such as limit setting and consistent consequences, create structure and predictability, and thus help lower anxiety. Indeed, parent-reported child problems are negatively correlated with parental limit setting in children with ASD (Osborne et al. 2008). In contrast, for children with high ASD symptom severity, these strategies may be more challenging for parents to utilize and thus have less of an effect on emotional difficulties such as anxiety.

Clinical Implications

Most interventions for anxiety in children on the autism spectrum include substantial parenting components, (e.g., Wood et al. 2009, 2020). Our study shows that while parenting responses may not differ in parents of TD children and children with ASD and comorbid anxiety, some parenting reactions may be related to both the severity of autism symptoms and co-occurring anxiety. Better and more nuanced understanding of parenting responses to children's emotions will be important for promoting emotion socialization of children with autism complicated by co-occurring emotional problems. This study reaffirms the need for careful consideration of parenting practices and child clinical characteristics in combination. For clinicians completing intakes or designing new interventions, a nuanced understanding of parents' patterns of emotion socialization in light of their children's autism severity is key. This will enable professionals to tailor treatments more precisely to each child's needs, as well as significantly build up parent-focused components of treatment, thereby promoting the well-being of the entire family.

Strengths and Limitations

This present study has many strengths including the utilization of a well-characterized sample of children with ASD and co-occurring anxiety, as well as the inclusion of both parent and child self-report of child anxiety. Prior research suggests that, despite some differences in rates of parent-reported and child self-reported anxiety in children with ASD, assessment of child anxiety in this population is optimized through the use of both informants (Blakeley-Smith et al. 2012; Kalvin et al. 2020; Ozsivadjian et al. 2012). Our finding that some parent socialization practices were

associated with parent-reported anxiety while other parent socialization practices were associated with child-reported anxiety suggests that there may be aspects of each type of report that are not captured by the other and validates the importance of including both reporters. This study also adds to the literature on parent emotion socialization of children with ASD by including a sample of older, school-aged children for whom the development of emotional difficulties, such as anxiety, may be more prevalent.

However, a few limitations of the present study deserve mention. Although the inclusion of subjects who were taking part in a treatment study allowed for a well-characterized sample, the use of this sample means that findings from the current study may not generalize to non-treatment-seeking populations.

The demographic homogeneity of our sample further limits the generalizability of our findings. For instance, the present study did not consider differential parenting styles of mothers and fathers. It would be worthwhile to explore gender-specific differences underlying parents' responses to their children on the spectrum (Roelofs et al. 2006; Hirschler-Guttenberg et al. 2015). Additionally, future work should follow the example of the current research on parenting of TD children and further examine cultural differences in parent emotion socialization. Studies could examine how individual interpretations and experiences of punitive discipline, which have been found to vary across cultures (Gershoff 2002; Deater-Deckard and Dodge 1997; Lansford et al. 2004), operate in families of children with ASD and anxiety.

The study's cross-sectional design precludes any conclusions regarding the direction of the associations between parent emotion socialization practices and child anxiety. While it is likely that parent responses to children's emotional states influence children's processing and experience of emotions, contributing to the presence or lack of emotional difficulties, such as anxiety, it is also likely that children's different emotional styles elicit differential styles of parent responding (Collins et al. 2000; Silverman et al. 2009). Future work should employ longitudinal designs in order to better elucidate these potential bidirectional associations.

In addition, while the CCNES has been widely used in research on parent emotion socialization, there are some limitations inherent to this measure. First, reporter bias and desirability to report one's parenting practices in a favorable light might have influenced parent responses on this measure. Including observational measures of parent emotion socialization practices in future studies is likely to enhance the assessment of emotion socialization.

Second, due to the hypothetical nature of the scenarios presented in the CCNES, the measure may not accurately capture a parent's experience of his/her child's distress. The items of the CCNES explicitly describe both the emotionally evocative scenario as well as the child's emotional experience (e.g., child is nervous due to anticipated separation from parent), but in real life parents may not always have such a clear understanding of their children's emotional state. This may be especially true of parents of children with ASD, who often have unusual patterns of emotional expression. Lastly, the CCNES does not capture consistency of parents' responses, which may be particularly important for children with ASD and anxiety who commonly experience distress related to intolerance of uncertainty (Vasa et al. 2018) and prefer predictability in social interactions. It is possible that the consistency and predictability of parent responses are as important as the quality of the response; however, future studies are needed to examine this possibility.

Future Directions

As the existing literature on parent emotion socialization in ASD is sparse, there is much room for continued research. Research on emotion socialization in the parents of TD children, on the other hand, is becoming increasingly nuanced, as researchers consider the individual, contextual, and temporal factors that influence the extent to which certain socialization practices are helpful to children (Castro and Nelson 2018). This study was a small step in the right direction, as it investigated the potential associations between parent emotion socialization practices and specific child factors (i.e., anxiety, ASD symptom severity) in children with ASD and comorbid anxiety. Further research examining parent factors, such as parent experiences, appraisals, and their own symptomatology, is warranted. While the current study assessed parent behaviors, it did not examine parent cognitions, such as the attributions they make about their children or their own anxiety and stress, all of which have been found to influence how they interact with their children. For example, anxious parents tend to catastrophize (Moore et al. 2004), believe that their children's anxiety is harmful (Francis and Choprita 2011), and convey to their children a heightened awareness of threat (Creswell and O'Connor 2006), which may foster or exacerbate child anxiety. Higher levels of parenting stress may decrease parents' ability to respond adequately to their children's behavior (Osborne and Reed 2010) and have been shown to predict externalizing and internalizing symptoms in both ASD and TD children (Bauminger et al. 2010). This "emotional transmission" from parents to children warrants further research (Zhou and Yi 2014).

Conclusion

The present study is the first to compare parent emotion socialization practices between children with ASD and comorbid anxiety to TD children and examine the associations between anxiety and emotion socialization practices in children with ASD and anxiety. Results revealed no differences in rates of different emotion socialization practices between parents of children with ASD and anxiety and parents of TD children. For children with ASD and anxiety, higher levels of anxiety were associated with more emotion-focused socialization practices. In addition, for children low in ASD symptom severity, lower levels of anxiety were associated with more punitive socialization practices. Results suggest that certain types of more directive emotion socialization approaches may be associated with lower anxiety in children with ASD, whereas socialization approaches aimed at changing the child's emotional experience may be associated with higher anxiety in this population. These associations likely reflect bidirectional processes, whereby parent emotion socialization practices impact children's anxiety symptomology and children's distinct profiles of anxiety and ASD symptoms elicit specific styles of emotion socialization from parents.

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Compliance with Ethical Standard

Conflict of Interest Dr. Sukhodolsky receives royalties from Guilford Press for a treatment manual on CBT for anger and aggression in children. Other authors (R.P.J., C.B.K., K.I.) have no biomedical financial interests or potential conflicts of interest to declare related to this present study.

Ethical Approval This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Yale University School of Medicine Institutional Review Board.

Informed Consent Informed consent was obtained from all participants included in the study.

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