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Identifying Moderators of the Link between Parent and Child Anxiety Sensitivity: The Roles of Gender, Positive Parenting, and Corporal Punishment

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Abstract

A substantial body of literature suggests that anxiety sensitivity is a risk factor for the development of anxiety problems and research has now begun to examine the links between parenting, parent anxiety sensitivity and their child's anxiety sensitivity. However, the extant literature has provided mixed findings as to whether parent anxiety sensitivity is associated with child anxiety sensitivity, with some evidence suggesting that others factors may influence the association. Theoretically, specific parenting behaviors may be important to the development of child anxiety sensitivity and also in understanding the association between parent and child anxiety sensitivity. In this study, 191 families (n = 255 children and adolescents aged 6–17 and their parents) completed measures of child anxiety sensitivity (CASI) and parenting (APQ-C), and parents completed measures of their own anxiety sensitivity (ASI) and their parenting (APQ-P). Corporal punishment was associated with child anxiety sensitivity and the child's report of their parent's positive parenting behaviors moderated the association between parent and child anxiety sensitivity. The child's gender was also found to moderate the association between parent and child anxiety sensitivity, such that there was a positive association between girls and parent anxiety sensitivity and a negative association in boys. The findings advance the understanding of child anxiety sensitivity by establishing a link with corporal punishment and by showing that the association between parent and child anxiety sensitivity may depend upon the parenting context and child's gender.

Anxiety sensitivity is defined as the fear of anxiety-related bodily sensations arising from beliefs that these sensations have harmful somatic, psychological, or social consequences (Reiss, 1991; Zinbarg, Barlow, & Brown, 1997). Individuals with elevated levels of anxiety sensitivity perceive their benign bodily sensations of arousal as particularly aversive, which in turn increases the frequency and intensity of their physiological sensations and amplifies their anxiety (Pollock et al., 2002; Reiss, 1991). Thus, this fear of fear perpetuates the cycle of anxiety (Pollock et al., 2002). A substantial body of literature suggests that anxiety sensitivity is a risk factor for the development of anxiety problems (Epkins, Gardner, & Scanlon, 2013; Hayward, Killen, Kraemer, & Taylor, 2000; Joiner et al., 2002; Schmidt et al., 2010; Schmidt, Lerew, & Jackson, 1997, 1999; Weems, Hayward, Killen, & Taylor, 2002; see Reiss, Silverman, & Weems, 2001 for a review).

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Given the role of anxiety sensitivity as a risk factor for future anxiety-related problems, researchers have now turned to understanding its developmental antecedents. For example, evidence of a genetic basis for anxiety sensitivity has been shown (Stein, Jang, & Livesley, 1999) and environmental factors such as childhood learning experiences and interpersonal relationships have been linked to childhood anxiety sensitivity (Weems, 2010). As the caregiver and family environment are primary environmental factors during childhood, previous research has focused largely on potential parental contributions to child anxiety sensitivity. Theoretically, parents with high levels of anxiety sensitivity may be more likely to display hyper-vigilance for their own symptoms as well as communicate catastrophic outcomes related to anxiety symptomology with their children (Drake & Kearney, 2008; Watt, Stewart, & Cox, 1998).

To date six studies have reported on the association between parent anxiety sensitivity and child anxiety sensitivity. Of these studies, three have *not* reported a significant relationship in clinical (Noël, Francis, Brinston, White, & St. John, 2008; Silverman & Weems, 1999 and community samples (van Beek, Perna, Schruers, Muris, & Griez, 2005), and three found that the relationship was conditional in clinical (East, Berman, & Stoppelbein, 2007) and community samples (Drake & Kearney, 2008; Tsao et al., 2005; see Francis & Noël, 2010 for review). For example, Tsao et al. (2005) examined the relationship between parent and child anxiety sensitivity in a sample of 244 youth (aged 8–18 years) and their parents. Results indicated a small correlation (r = .15) between parent (ASI score) and child anxiety sensitivity (CASI scores); but authors reported that the effect varied by age and gender, with the association only significant for girls over 12 years of age (r = .41, p < .01) when the association was analyzed by age and gender groupings (all other rs < .13, ns). Drake and Kearney (2008) found a non-significant association between a latent measure of parent anxiety sensitivity (factors of the ASI as the observed measures) and child anxiety sensitivity (also latent with CASI subscales as observed) in a community sample of 147 youth (aged 7–18 years) but did report significant associations between CASI and ASI subscales[1].

Drawing from developmental psychopathology models (Sroufe & Rutter, 1984; Vasey & Dadds, 2001), the dynamic and complex interactions between children and their environment may influence individual pathways in the development of anxiety sensitivity (Weems, 2010). Parenting behaviors may provide unique prediction of child anxiety sensitivity but also influence the relationship between parent and child anxiety sensitivity. That is, parental anxiety sensitivity be more or less strongly associated with the child's anxiety sensitivity depending on the parenting context in which the child experiences their parent's anxiety sensitivity. The concept of multifinality suggests that a single risk factor (parent anxiety sensitivity) can lead to multiple outcomes (high child anxiety sensitivity or not) depending on the parenting context in which it occurs (Cicchetti & Rogosch, 1996).

[1]Drake and Kearney (2008) reported that the CASI unsteady concerns scale correlated with ASI somatic concerns (r = .22, p < .05), ASI losing control (r = .20, p < .05), and ASI phrenophobia (r = .25, p < .05); CASI social concerns correlated with ASI somatic concerns (r = .26, p < .05), ASI losing control (r = .19, p < .05), and ASI phrenophobia (r = .24, p < .05).

A few studies to date have examined specific parenting behaviors in relation to anxiety sensitivity. For example, Scher and Stein (2003) examined the relationship between threatening, hostile, and rejecting parenting behaviors and child anxiety sensitivity (measured with the ASI) in a sample of 249 undergraduate university students (aged 17–54 years, M_{age} = 19.55). This study found that the parenting variables collectively accounted for 6.7% ($p < .005$) of the variance in overall anxiety sensitivity (see also Gardner & Epkins, 2012 and Nebbitt & Lambert, 2009). Similarly, Gray, Carter, and Silverman (2011) examined perceived parenting acceptance and parental control behaviors in relation to child anxiety sensitivity (measured by the CASI) in a community sample of 266 school-aged African American youth (aged 8–13 years, M_{age} = 9.88). Results showed that high parental control was related to high levels of child anxiety sensitivity ($B = .28$, 95% CI = [.04, .51], $p < .05$) but that parental acceptance was not significantly related.

Theoretically, parenting behaviors may also moderate the relationship between parent and child anxiety sensitivity. In particular, positive parenting may buffer the association between parent anxiety sensitivity and child anxiety sensitivity. Parents who nurture their children through complimenting the child and providing positive reinforcement of the child's behavior may help their children regulate their emotions and cope with their fears instead of avoiding them, thereby reducing the risk conferred through high parent anxiety sensitivity. Parents who use positive parenting strategies may also be less likely to display high anxiety sensitivity in front of their children (thereby decreasing opportunities for the child to model their parents' anxiety sensitivity). While Gardner and Epkins (2012), Gray et al. (2011), Nebbitt and Lambert (2009), and Scher and Stein (2003) examined the association between youths' anxiety sensitivity and parenting behaviors, these studies did not test if parenting behaviors moderate the relationship between parent and child anxiety sensitivity. Thus, the examination of positive parenting may help identify conditions in which parent and child anxiety sensitivity are related and help clarify the apparent inconsistency in the extant literature on the relationship between parent and child anxiety sensitivity.

In contrast, negative parenting behaviors may theoretically exacerbate the link between parent and child anxiety sensitivity. Some evidence suggests that ineffective and harsh discipline may be risk factors for vulnerable children (Laskey & Cartwright-Hatton, 2009). Additionally, McLeod, Weisz, and Wood (2007) found parental rejection to be associated with children's anxiety. Research shows that children exposed to corporal punishment are more likely to have problems with emotional and behavioral adjustment (Aucoin, Frick, & Bodin, 2006) and show more anxiety symptoms (Rodriguez, 2003), but the association between child anxiety sensitivity and corporal punishment has yet to be tested. Corporal punishment may be associated with higher child anxiety sensitivity or it might serve to strengthen (moderate) the link between parent anxiety sensitivity and child anxiety sensitivity. Harsh parental discipline such as corporal punishment may lead to a threatening environment, which may be fertile grounds for the development of anxiety sensitivity in a vulnerable child (i.e., a child whose parent has high anxiety sensitivity).

In summary, this study sought to test the theoretical proposition that parenting behaviors may serve as moderators of the association between parent and child anxiety sensitivity. In addition, gender and age may serve as moderators of the relationship between parent and

child anxiety (Tsao et al., 2005) but few studies have tested this proposition. We predicted that parent anxiety sensitivity and parenting behaviors (positive parenting negatively and corporal punishment positively) would be associated with child anxiety sensitivity. We further predicted that parenting behaviors would moderate the association between parent anxiety sensitivity and child anxiety sensitivity. Specifically, that among children with high positive parenting (e.g., praise, compliments), parent anxiety sensitivity would be less strongly associated with child anxiety sensitivity because these positive parenting behaviors would provide a buffering effect while in those youth exposed to high corporal punishment, the association would be stronger. Based on findings in Tsao et al. (2005) gender and age were also expected to moderate the association between parent and child anxiety sensitivity. The specificity of the associations to child anxiety sensitivity was also tested by examining if similar associations exist between parent anxiety sensitivity and child anxiety in general.

Method

Participants

The sample for this study was composed of 255 youth (51.4% male) aged 6 to 17 years (M_{age} = 12.28 years) from 191 families (92.6% maternal parent). The ethnicity of the sample was: 43.3% Caucasian, 37.8% African-American, 6.7% Hispanic, .8% Asian, and 11.4% of other ethnic backgrounds. The range of the family income for this sample was as follows: Less than $20,000 (36.9%), $20,000 – $49,999 (35.7%), over $50,000 (26.3%), and did not report (1.1%).

Measures

Parent Anxiety Sensitivity—Parent anxiety sensitivity was assessed using the Anxiety Sensitivity Index (ASI; Reiss, Peterson, Gursky, & McNally, 1986). The ASI is a 16-item questionnaire designed to measure the extent to which individuals believe that symptoms of anxiety cause illness, embarrassment, or additional anxiety. Responses are scored 0 (*very little*), 1 (*a little*), 2 (*some*), 3 (*much*), and 4 (*very much*). Validity estimates of the ASI have been established in numerous studies (e.g., Peterson & Plehn, 1999, Taylor, 1999). Further, the ASI has been demonstrated to have good internal consistency (Cronbach's α = .82; Telch, Shermis, & Lucas, 1989) and good test-retest reliability (r = .71 for a 3 year interim; Maller & Reiss, 1992). Consistent with previous findings, the current sample showed good internal consistency (Cronbach's α = .88).

Child Anxiety Sensitivity—Child anxiety sensitivity was assessed using the Children's Anxiety Sensitivity Index (CASI; Silverman, Fleisig, Rabian, & Peterson, 1991). The CASI is an 18-item self-report questionnaire designed to assess the extent to which children believe their anxiety symptoms will have negative consequences. Responses are scored 1 (*none*), 2 (*some*), and 3 (*a lot*). Weems, Berman, Silverman, and Rodriguez (2002) reported strong convergent validity estimates between ASI and CASI scores (r = .73) in a sample of high-school youth. Weems, Hammond-Laurence, Silverman, and Ginsburg (1998) reported that the CASI exhibited incremental validity in predicting fear beyond that accounted for by trait anxiety in children and adolescents. Silverman et al. (1991) showed that CASI scores were relatively stable over a 2-week interval with a test–retest correlation of .76 in a clinic-

referred sample (aged 8–15 years) and .79 in a non-clinic referred sample (aged 11–16 years). Internal consistency estimates for the CASI have repeatedly been found to be above .80 (e.g., Silverman et al., 1991; Weems, Costa, Watts, Taylor, & Cannon, 2007). The internal consistency estimate in the current sample was good (Cronbach's α = .87).

Parenting Behaviors—Parenting behaviors were assessed using the parent and child versions of the Alabama Parenting Questionnaire (APQ-P and APQ-C; Frick, 1991; Shelton, Frick, & Wootton, 1996). The APQ (both parent and child measure) is a 42-item self-report measure that assesses parenting practices across multiple domains. Of the behaviors assessed, the positive parenting (measured by six items; e.g., "Your parents praise you for behaving well") and corporal punishment (measured by three items; e.g., "Your parent hits you with a belt, switch, or other object when you have done something wrong") subscales were the focus in the present study. Directions tell the parent/child to circle the number that best describes how often each item typically occurs in their home on a 5-point scale where 1 = *never* and 5 = *always*. A number of previous studies have found the APQ-P and APQ-C to demonstrate good reliability and validity estimates. For example, Shelton et al. (1996) reported that scales from the APQ were generally uncorrelated with measures of a socially desirable response set for both the child report and parent report forms (child report: r = .17 [positive parenting], .13 [corporal punishment]; parent report: .15 [positive parenting], −.14 [corporal punishment]). The current sample showed good internal consistency on both the child and parent report (i.e., child report: Cronbach's α = .79 [positive parenting], .77 [corporal punishment]; parent report: Cronbach's α =.82 [positive parenting], .85 [corporal punishment]).

Anxiety Symptoms—Anxiety symptoms were assessed using the Revised Child Anxiety and Depression scales (RCADS; Chorpita, Yim, Moffitt, Umemoto, & Francis, 2000). The RCADS is a 47-item instrument that assesses symptoms of anxiety disorders and depression. Thirty-seven items comprise the anxiety scale. The scale is scored 1 (*never*), 2 (*sometimes*), 3 (*often*), and 4 (*always*). Chorpita et al. (2000) reported 1-week test-retest reliabilities in the high .70s and demonstrated that the RCADS has good convergent validity with other measures of childhood anxiety symptoms and anxiety disorders. Parents completed a parent version of the RCADS (RCADS-P) designed identically to the RCADS child version with word modification for parent completion (i.e., wording was changed from "I" to "My child"). The RCADS total anxiety score was used in this study. Internal consistency was high in this sample for the parent (Cronbach's α = .92) and child (Cronbach's α = .93) total anxiety score.

Procedure

Data from this study were collected by the Youth and Family Anxiety, Stress, and Phobia Lab of the University of New Orleans (UNO). The UNO IRB reviewed and approved the study. Participants were self-referrals from the New Orleans community and UNO classes. Fliers were distributed at various community agencies in New Orleans and surrounding areas (i.e., schools, grocery stores, libraries, physicians' offices, etc.) and to students enrolled in UNO classes. Parents (primary caregivers) with a child (or multiple children) aged 6 to 17 years were recruited for participation in the study. Both the youth and the

parent were greeted upon arrival and given a general overview of the assessment procedures. Informed consent was obtained from the parent and informed assent was obtained from the child. Parent and child completed a battery of questionnaires in separate, quiet rooms. Participants were assisted as necessary by trained research assistants or graduate students. At the conclusion of the study, participants were debriefed and given a small monetary reward.

Data Analytic Strategy

Due to the recruitment inclusion criteria, 64 families in the sample participated with more than one child (n = 1 family with 4 children, n = 9 families with three children, n = 54 families with two children). In cases when multiple children participated from a family, parents completed parenting measures (APQ) about each child (n = 255, there were no missing APQ positive parenting scores, 2 missing CASI scores, and 16 missing corporal punishment scores). Parents completed the ASI only in regard to their own anxiety sensitivity (ASI; n = 191; there was no missing ASI scores). Thus, children were nested within families and this dependency in the data was handled by testing hypotheses with hierarchical linear modeling (HLM 7; Raudenbush et al., 2011)[3]. Missing data was handled by list wise deletion of missing cases in analyses. In predicting CASI scores, child's age, child's gender, and report of parenting behaviors specific to that child were Level 1 predictors and parent anxiety sensitivity (as measured by the ASI) was tested on Level 2. The model thus includes interaction terms of age, gender and parenting behaviors with parent ASI. Moderation was identified by the significance of these interaction terms. Significant effects were then plotted to determine the nature of the conditional association.

Results

Preliminary Data Analyses

The mean scores and standard deviations for each measure are presented in Table 1. The APQ corporal punishment score (child and parent report), ASI total score, CASI total score, and the RCADS anxiety scores (i.e., RCADS-P and RCADS-C) were positively skewed. The positive parenting score (parent report) was negatively skewed. Because of the skewedness, several steps were taken to ensure that the uneven distributions did not affect conclusions reported here. This included comparing conclusions from the parametric analyses with non-parametric alternatives (Spearman correlations supplemented Pearson's correlations) and comparing the findings using data transformations (i.e., when testing hypotheses in HLM, transformed versions of the variables were also tested) to reduce skew versus untransformed variables. The APQ positive parenting score (parent report) and ASI total score, were moderately skewed and corrected using square root transformations. CASI total scores, corporal punishment scores (child and parent report), RCADS-P scores, and RCADS-C scores were transformed using a log transformation which improved each distribution. In general, the pattern of findings across parametric analyses and non-parametric alternatives using data transformations versus untransformed variables was highly similar and importantly conclusions were identical, and so the analyses reported next focus on the non-transformed versions with any differences noted.

[3]HLM findings indicated no family level effects, and therefore, all siblings were retained in the sample.

The correlations between the ASI and the other measures (Table 1) were conducted with the sample size of 191 using one random child per household given the nature of the data. However, the main effect of ASI score on CASI scores was tested via HLM - where the main effect was the same. Associations among other variables (in Table 1) were run with the full sample size (n = 255). The results of both parametric and non-parametric correlations consistently found that the correlation between parent anxiety sensitivity as measured by the ASI total score and child anxiety sensitivity as measured by the CASI total score was non-significant[2]. Parent anxiety sensitivity was significantly positively associated with their child's anxiety symptoms (RCADS-parent report). Child anxiety sensitivity was negatively significantly associated with age and positively associated with corporal punishment (parent and child report) and the child's anxiety symptoms (RCADS-child report). Age was also negatively associated with child's anxiety symptoms (child report), positive parenting (child and parent report), and corporal punishment (child and parent report).

HLM Hypothesis Testing

Parenting behaviors and the child's gender were next examined as potential moderators with multilevel modeling analyses using HLM 7 (Raudenbush et al., 2011) to account for the nesting of child variables within the parent report of the ASI. Specifically, HLM analyses nested children (Level 1) as a function of their anxiety sensitivity within their family (Level 2; i.e., their parent's anxiety sensitivity). All HLM analyses were conducted with age and gender (coded 1 = boy and 2 = girl) as Level 1 predictors, ASI total score (grand-mean centered) as the Level 2 variable, and CASI total score as the outcome variable. Each APQ subscale (positive parenting and corporal punishment from both the parent and child report) was tested in a separate model as a Level 1 predictor. Results on the analysis, summarized in Table 2, indicated that youths' younger age was associated with higher anxiety sensitivity [coefficient = −0.44, $t(247) = -3.09$, $p < .05$] but age did not significantly interact with their parent's level of anxiety sensitivity to predict child anxiety sensitivity levels. Results also indicated that gender [coefficient = 0.18, $t(247) = 2.33$, $p < .05$] significantly interacted with parent anxiety sensitivity levels to predict child anxiety sensitivity levels, such that there was a positive association in girls and a negative association in boys (see Figure 1). Perceived positive parenting (child report) also significantly interacted [coefficient = −0.02, $t(187) = -2.71$, $p < .05$] with parent anxiety sensitivity to predict child anxiety sensitivity levels (Table 2), such that in the context of high positive parenting (+1 SD above mean), there was a negative association between parent anxiety sensitivity and child anxiety sensitivity and in the context of low positive parenting (−1SD above the mean), there was a positive association (see Figure 2)[4] Thus, parent anxiety sensitivity was only positively associated with child anxiety sensitivity in the context of low positive parenting.

Identical HLM models were run with positive parenting by parent report and corporal punishment (both child and parent reported) as moderators and results did not show these to moderate the association between parent and child anxiety sensitivity. There was, however, a significant main effect of corporal punishment (child report) on child anxiety sensitivity

[2]The pattern was similar in correlations between the subscales of the ASI and CASI (mental concerns, social concerns, and physical concerns); results indicated no significant associations.
[4]Significant HLM findings remained when excluding fathers (n = 14) from the sample.

[coefficient = 0.72, $t(187) = 4.47$, $p < .001$]. There was also a significant main effect of parent reported corporal punishment behaviors on child anxiety sensitivity [coefficient = 0.49, $t(187) = 2.13$, $p < .05$] when the ASI, CASI, and corporal punishment scores analyzed were transformed.

In order to examine if the associations found are specific to anxiety sensitivity or are generalizable to anxiety, an additional HLM analysis was conducted with the child's anxiety symptoms as the outcome variable, the parent's anxiety sensitivity as the Level 2 variable, and the child's gender, age, and positive parenting (child report) as Level 1 predictors. Results indicated non-significant findings. Neither positive parenting nor gender moderated the association between parent anxiety sensitivity and child anxiety. A HLM analysis was also conducted testing an interaction between child anxiety sensitivity (CASI; Level 1) and parent anxiety sensitivity (ASI; Level 2) predicting child's anxiety (run separately with parent report and the child report of the RCADS; outcome variable), and results indicated a non-significant interaction. Moreover, controlling for RCADS anxiety in the main HLM analyses did not change the other significant findings (i.e., the main effect of corporal punishment).

Discussion

Findings were consistent with the hypothesis that positive parenting would moderate the association between parent and child anxiety sensitivity. Theoretically, the child's perception of their parent as using positive parenting techniques may reduce the child's risk of anxiety sensitivity conferred by having a parent with high anxiety sensitivity (e.g., parental modeling of hyper-vigilance to their bodily feelings of anxiety). There are several reasons why positive parenting might moderate the association between parent and child anxiety sensitivity. Parents who focus on the positive aspects of their children's behavior may be more likely to notice and reinforce their child's accomplishments and prosocial behavior (e.g., child enduring an anxiety-provoking situation versus avoiding it). Additionally, supportive, positive parents may also be more likely to teach their children emotional regulation and coping techniques to manage their sensitivity to their body's reaction to fearful stimuli. Alternatively, parents with high anxiety sensitivity who also fail to model healthy reactions to their own fear or fail to praise their children for facing and coping with their fears (i.e., low positive parenting techniques) may foster high levels of anxiety sensitivity in the children as well.

The lack of a significant moderating effect of the parent's report of his or her own use of positive parenting on the relationship between parent and child anxiety is interesting as the parent and child's report of positive parenting behaviors was significantly correlated. However, parents on average, reported higher levels of positive parenting use than did children. Although the reason for this finding can only be speculated based on the data in this study, it may be that the child's perception of positive parenting is more important to moderating the negative effect of elevated parental anxiety sensitivity.

Consistent with Tsao et al. (2005) gender was also found to moderate the association between parent and child anxiety sensitivity, such that there was a positive association

between girls and parent anxiety sensitivity. However, unexpectedly, there was a negative association for boys. This leads to speculation as to why girls may be more susceptible to the transmission of high anxiety sensitivity from their parents than are boys. In a study by Gerull and Rapee (2002), toddlers showed more behavioral avoidance to a fear relevant toy (i.e., a spider or snake) in which they witnessed their mother showing a negative face, and girls in the study generally responded with more fear than the boys. It may be that girls focus more on their mother's reactivity to fearful situations or interpret it and encode it to long-term memory differently than boys. It may also be that girls are more sensitive to the social consequences they believe are associated with the external expression of their anxiety (i.e., social ridicule) than are boys.

Conversely, the negative association in boys may be attributable to factors such as gender role theories and differences in socialization practices for boys versus girls. For example, parents may coddle their daughter after she falls down but encourage their son in the same situation to "brush it off" and keep playing thus decreasing the likelihood that the boy will be as emotionally reactive in future similar situations. It may also be that children are more attentive and responsive to behavior modeling of their same sex parent, and thus the negative association found in boys was due to the underrepresentation of fathers in the sample. However, these ideas are speculative in nature and would have to be tested in further research.

This is the first study to show that corporal punishment is associated with child anxiety sensitivity. Theoretically, corporal punishment may decrease a child's sense of control of their environment and, more specifically, their sense of control of their body's reaction to fear thus amplifying their anxiety sensitivity. Additionally, while low internal consistency for the corporal punishment subscale of the APQ has been an issue raised in previous research (α = .53, Hawes & Dadds, 2006), the current study found strong internal consistency for both the child (.77) and parent report (.85) of the corporal punishment subscale, providing confidence in the link found between corporal punishment and child anxiety sensitivity in this study. Corporal punishment was not found to moderate the association between parent and child anxiety sensitivity as hypothesized. This may be due to the fact that parents are less likely to use corporal punishment as a disciplinary technique with older children, but additional longitudinal research is required to test this idea.

This is the only study to date that has analyzed the relationship between parent and child anxiety sensitivity in the context of parenting behaviors. The study also examined a behavior that has not been previously looked at in relation to anxiety sensitivity (i.e., corporal punishment) and examined an ethnically diverse sample of youth spanning a wide age range (ages 6 to 17 years). Furthermore, by collecting both the child and parent's report of the parenting behaviors, this study provided a view of parenting behaviors from both the parent and child perspective. For example, while positive parenting was only a moderator from the child perspective both parent and child report of corporal punishment was associated with child anxiety sensitivity. In addition, because the study was not retrospective in nature as have been many previous studies on the origins of anxiety sensitivity, it is less likely that the informants' memories of the behaviors have been changed or distorted over time. Lastly, the use of HLM accommodated the nested study design by accounting for variance shared

between multiple children from one family whereas the use of traditional linear regression would have only allowed for one child per family to be analyzed, thus decreasing the sample size and power of the analyses.

Although this study adds to the existing literature, several limitations must be considered. First and most importantly, the cross-sectional design of this study prohibits causal inferences. Second, additional factors not examined in the present study may have influenced the variables of interest (e.g., marital conflict might exacerbate the association between parent and child anxiety sensitivity). Third, the sample was composed of community recruited youth and thus findings may not be generalizable to clinical populations. Fourth, all data were collected through child and parent self-report (versus a direct observation of the behavior), thus introducing the possibility of participant biases. Lastly, because the sample consisted mainly of mothers, there were insufficient numbers of fathers to conduct separate HLM analyses by parent gender. Whether this association exists with fathers and identification of factors that may moderate this possible relationship await further study.

Future research is still needed to clarify the association between parent and child anxiety sensitivity and to further investigate the role of parenting behaviors on this relationship. Ideally, longitudinal studies including multiple informants (parent and child report) with equal representation of mothers and fathers in the sample are needed as mothers and fathers may play different roles in their child's development of anxiety sensitivity. Additionally, adding a measure of behavioral observation of parenting behaviors as a comparison against the self-report measures would distinguish between perceptions of behaviors versus observable behaviors as well as control for biases associated with self-report measures.

In summary, insight into the etiology of child anxiety sensitivity can aid in prevention and intervention efforts to prevent psychopathology in youth. Specifically, future research building on this idea may identify positive parenting behavioral techniques that can be taught to parents with high anxiety sensitivity to protect their children from the risk of developing anxiety sensitivity and thus future anxiety disorders in general. For example, providing society with more information on the construct of anxiety sensitivity as well as the detrimental effects it has on the development of psychopathology would foster greater awareness in parents who may inadvertently model their own anxiety sensitivity or fail to implement positive parenting techniques which may help protect their children from the development of anxiety sensitivity. Additionally, corporal punishment in relation to anxiety sensitivity should continue to be investigated to better inform parents of specific discipline techniques that may foster anxiety sensitivity in their children.

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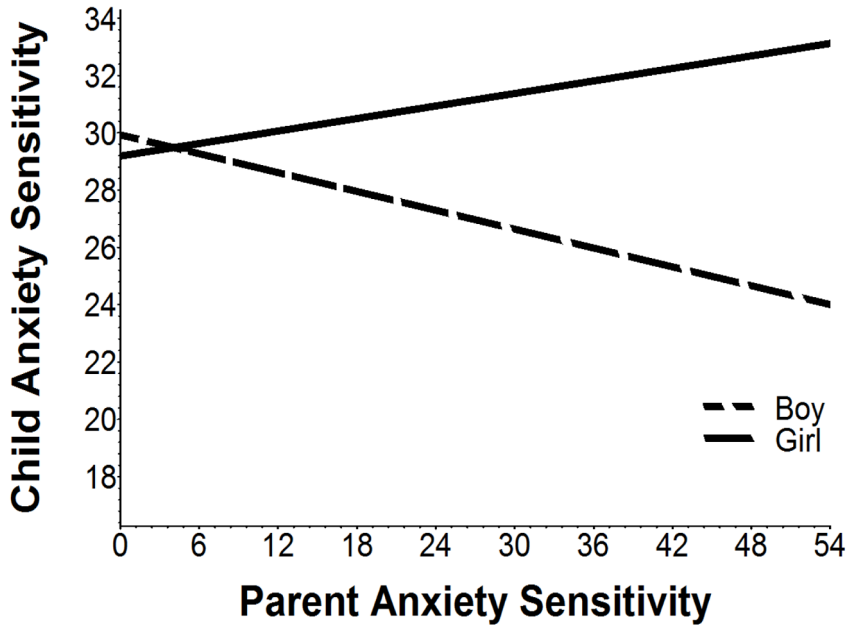

Figure 1.

Gender moderates the relationship between parent anxiety sensitivity (ASI) and child anxiety sensitivity (CASI). Positively associated for girls and negatively associated for boys

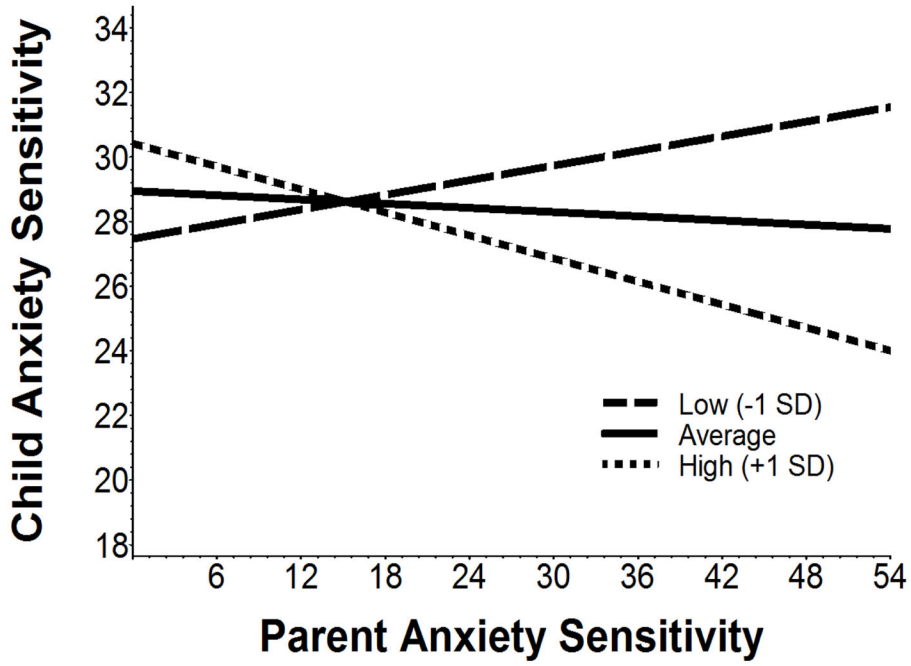

Figure 2.

Positive parenting moderates the relationship between parent anxiety sensitivity (ASI) and child anxiety sensitivity (CASI) for low positive parenting (−1 SD below the mean), average positive parenting (mean), and high positive parenting (+1 SD above the mean) based on APQ-C positive parenting subscale

Table 1

Means, Standard Deviations and Correlations among Study Measures

	1	2	3	4	5	6	7	8	9	*M*	*SD*
1. ASI total										19.13	11.28
2. CASI total	.01									29.04	6.99
3. APQ-C Parenting	−.06	.02								22.48	4.83
4. APQ-C Punishment	.05	.30**	.02							5.05	2.74
5. APQ-P Parenting	−.09	.07	.40**	.11						25.52	3.66
6. APQ-P Punishment	.04	.19**	.11	.50**	.08					5.06	2.36
7. RCADS-C anxiety	.04	.72**	−.06	.26**	.05	.19**				62.71	15.96
8. RCADS-P anxiety	.31**	.04	.08	−.02	<.01	<.01	.18**			51.81	10.55
9. Child's Age	.11	−.19**	−.18**	−.39**	−.24**	−.33**	−.16*	−.05		12.28	3.23
10. Child's Gender	.14	.16*	.10	−.09	<−.01	−.02	.17**	.11	.05	n/a	n/a

Note:

** $p < .01$ level,

* $p < .05$ level;

ASI = Parent Anxiety Sensitivity Index; CASI = Child Anxiety Sensitivity Index; APQ-C = Alabama Parenting Questionnaire- Child Report; APQ-P = Alabama Parenting Questionnaire- Parent Report; Parenting = Positive; Punishment = Corporal Punishment; Parenting RCADS-C anxiety, Revised Child Anxiety and Depression Scales- Child Report; RCADS-P anxiety, Revised Child Anxiety and Depression Scales- Parent Report.

Table 2

Hierarchical Linear Modeling Predicting Child Anxiety Sensitivity

Fixed Effect	Coefficient	*SE*	*t*-ratio	*df*	*p*-value
Intercept, β_0					
Intercept, γ_{00}	30.16	2.14	14.10	187	<0.001
ASITOT, γ_{01}	−0.50	0.19	−2.68	187	0.008
Gender slope, β_1					
Intercept, γ_{10}	2.75	0.89	3.11	247	0.002
ASITOT, γ_{11}	0.18	0.08	2.33	247	0.021
Age slope, β_2					
Intercept, γ_{20}	−0.44	0.14	−3.09	247	0.002
ASITOT, γ_{21}	0.02	0.01	1.22	247	0.226
Positive parenting child report slope, β_3					
Intercept, γ_{30}	−0.08	0.09	−0.89	187	0.374
ASITOT, γ_{31}	−0.02	0.01	−2.71	187	0.007

Note: ASITOT = Anxiety Sensitivity Index (ASI) total sum score. The mixed model equation was $Child\ anxiety\ sensitivity\ index\ score_{ij} = \gamma 00 + \gamma 01{*}Parent\ anxiety\ sensitivity\ index\ score_j + \gamma 10{*}Gender_{ij} + \gamma 11{*}Parent\ anxiety\ sensitivity\ index\ score_j{*}Gender_{ij} + \gamma 20{*}Age_{ij} + \gamma 21{*}Parent\ anxiety\ sensitivity\ index\ score_j{*}Age_{ij} + \gamma 30{*}Positive\ parenting\ child\ report_j + \gamma 31{*}Parent\ anxiety\ sensitivity\ index\ score_j{*}Positive\ parenting\ child\ report_{ij} + u0j + u3j{*}Positive\ parenting\ child\ report_{ij} + r_{ij}$.