

Fall 12-20-2013

## Anxiety Sensitivity and its Association with Parenting Behaviors

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Anxiety Sensitivity and its Association with Parenting Behaviors

A Thesis

Submitted to the Graduate Faculty of the  
University of New Orleans  
in partial fulfillment of the  
requirements for the degree of

Master of Science  
in  
Psychology

By

Rebecca Ann Graham

B.S. Louisiana State University, 2011

December, 2013

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## **Abstract**

The aim of this study was to examine the association between parent and child anxiety sensitivity in the context of parenting behaviors, specifically by testing parenting behaviors as moderators or mediators of the association between parent and child anxiety sensitivity. Past research implies that parent anxiety sensitivity may be more related to child anxiety sensitivity (moderation) in girls and in the context of certain parenting. Alternatively, parenting behaviors may better account for the association (mediate) between parent and child anxiety sensitivity. To test the hypotheses 191 families ( $n = 255$  youth aged 6-17 and their parents) completed measures of child anxiety sensitivity (CASI) and parenting (APQ-C), and parents completed measures of their anxiety sensitivity (ASI) and parenting (APQ-P). Hypotheses were tested with hierarchical linear modeling. Results indicated that the child's gender and the child's report of their parent's positive parenting behaviors moderated the association between parent and child anxiety sensitivity.

anxiety, anxiety sensitivity, parenting

# **Anxiety Sensitivity and its Association with Parenting Behaviors**

## **1. Introduction**

Anxiety disorders are among the most common forms of psychopathology in youth with prevalence estimates ranging from 12 to 17 percent (Vasey & Ollendick, 2000). Identifying developmental antecedents of child anxiety disorders has potential implications for prevention as well as improving the treatment of childhood anxiety disorders and thus is an important focus of research. As reviewed by Weems and Silverman (2008), the etiology of childhood anxiety problems is best understood from a developmental psychopathology perspective, which emphasizes the dynamic and complex interactions among multiple processes across development. The specific processes implicated in the etiology of problematic anxiety include but are not limited to biological processes (genetics, psychophysiology), behavioral learning processes (observational and respondent learning), social and interpersonal processes (attachment and sociability), and cognitive processes (information processing; see Weems & Silverman, 2008). Anxiety sensitivity has emerged as an important cognitive predictor of anxiety problems.

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 (Reiss, 1991; Pollock et al., 2002). 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 (Joiner et al., 2002; Schmidt et al., 2010;

Hayward, Killen, Kraemer, & Taylor, 2000; Schmidt, Lerew, & Jackson, 1997, 1999; Weems, Hayward, Killen, & Taylor, 2002b; see Reiss, Silverman, & Weems, 2001 for a review). In fact, several studies have demonstrated the incremental validity of anxiety sensitivity beyond trait anxiety (an established predictor) in both child and adolescent samples (Weems, Hammond-Laurence, Silverman, & Ferguson, 1997; Weems, Hammond-Laurence, Silverman, & Ginsburg, 1998; Rabian, Embry, & MacIntyre, 1999; Pollock et al., 2002). Furthermore, even after controlling for baseline levels of anxiety symptoms, research shows that anxiety sensitivity significantly predicts future development of anxiety symptoms in youth (Hayward et al., 2000; Schmidt et al., 2010) and adults (Schmidt et al., 1997, 1999). Anxiety sensitivity is typically measured with the Anxiety Sensitivity Index (ASI; Reiss, Peterson, Gursky, & McNally, 1986) in adult samples and with the Childhood Anxiety Sensitivity Index (CASI; Silverman, Fleisig, Rabian, & Peterson, 1991) in youth samples (specifically youth aged 6-17 years).

Given the role of anxiety sensitivity as a risk factor for future anxiety-related problems, researchers have now turned to understanding its developmental antecedents. Evidence for a genetic basis for anxiety sensitivity has been shown in research with an adult sample. Stein, Jang, and Livesley (1999) found that genetic influences account for roughly 45% of the variance in individuals' levels of anxiety sensitivity. Therefore, anxiety sensitivity may be a temperamental predisposition that is genetically transmitted from parent to child. However, genetic influences are not simple one to one relations. Temperamental predispositions may affect the mother-infant attachment and so the parent-child relationship may affect genetic expression and therefore play a role in the development of anxiety sensitivity. Research indicates that insecurely attached children may be at risk for future anxiety problems (Manassis & Bradley, 1994; Dallaire & Weinraub, 2007). As proposed by Bowlby (1973), insecurely attached children

lack confidence in their caregiver's accessibility, which may increase their susceptibility to developing fears and anxiety. Over time, insecurely attached children internalize their experiences with their caregiver, generating prototypes through which they view future relationships and experiences. Weems and colleagues (Weems, Berman, Silverman, & Rodriguez, 2002a) hypothesized that the heightened sensitivity to rejection characteristic of insecurely attached children may lead to the increased likelihood of attending to anxiety-related stimuli (versus other environmental stimuli) and distorted thinking (e.g., interpreting ambiguous stimuli as threatening). Thus, insecurely attached children may be hyper-vigilant to the consequences of experiencing anxiety symptoms (i.e., higher anxiety sensitivity). Alternatively, secure parent-infant attachment may serve as a protective factor against future risk of developing anxiety sensitivity and anxiety symptomology.

In addition, environmental factors such as childhood learning experiences and interpersonal relationships (e.g., parenting) have been hypothesized to contribute to childhood anxiety sensitivity (Weems, 2010). As initially theorized by Reiss and McNally (1985) and repeated by Weems (2010), "Beliefs acquired in childhood (e.g., learning) about the consequences of anxiety may strengthen or weaken individual differences in anxiety sensitivity" (p. 15). Thus, an individual's predisposition to develop anxiety sensitivity (i.e., family history of panic, high autonomic reactivity) may be altered by the interaction between their genetic predisposition and cognitive or operant learning conditioning processes (Watt, Stewart, & Cox, 1998; Weems et al., 2002b; Schmidt, Lerew, & Joiner, 2000; Stewart et al., 2001). As the caregiver and family environment are the primary environmental factors during childhood, previous research has focused largely on potential parental contributions to child anxiety sensitivity. This literature is based upon the notion that beliefs about the harmful nature of

anxiety can be transmitted from parent to child. For example, 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 (Watt et al., 1998; Drake & Kearney, 2008). Children exposed to parents' poor coping strategies such as catastrophizing and avoidance are less adept at effectively regulating their fear and anxiety and thus may develop elevated levels of anxiety sensitivity as well (Wood, McLeod, Sigman, Hwang, & Chu, 2003). Parents may also maintain or exacerbate their children's elevated levels of anxiety sensitivity through reinforcement (operant conditioning; Stewart et al., 2001). For example, parents may reinforce their child's sick role behaviors through positive (i.e., extra attention) or negative reinforcement (i.e., permission to stay home from school), increasing the likelihood that these behaviors occur in the future. Conversely, if a child's exaggerated anxiety complaints/displays are discouraged by the parents, these behaviors may be less likely to reoccur in the future, thus contributing to lower levels of anxiety sensitivity (Watt et al., 1998). By teaching children that bodily responses to anxiety provoking situations are normative and controllable, parents may decrease the likelihood that children will experience elevated levels of anxiety sensitivity during subsequent exposure to fearful situations. Thus, both genetic and environmental theories suggest a link between parent and child anxiety sensitivity.

### **1.1 Parent Anxiety Sensitivity Predicting Child Anxiety Sensitivity**

A total of six studies have examined the association between parent anxiety sensitivity and child anxiety sensitivity. Of these studies, three have not reported a significant relationship (Silverman & Weems, 1999; van Beek, Perna, Schruers, Muris, & Griez, 2005; Noël, Francis, Brinston, White, & St. John, 2008) and three found that the relationship was conditional (Drake & Kearney, 2008; East, Berman, & Stoppelbein, 2007; 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 study of 147 youth (aged 7-18 years) but did report several significant associations between CASI and ASI subscales<sup>1</sup>. In a sample of 172 university students ( $M_{age} = 20.6$  years) and their parents, East et al. (2007) found an insignificant relationship between maternal anxiety sensitivity and their child's anxiety sensitivity ( $r = .11, p = .23$ ; child and parent report of anxiety sensitivity was measured with the ASI). Based on these overall findings of varying effect sizes and conditional relationships, it appears that the relationship between parent and child anxiety sensitivity may be moderated by other factors such as age, gender, or parenting.

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<sup>1</sup> 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 ( $r = .24, p < .05$ ).

## **2. Role of Parenting Behaviors in the Development of Anxiety Sensitivity**

Drawing from developmental psychopathology models, the dynamic and complex interactions between children and their environment influence individual pathways in the development of anxiety sensitivity. In particular, parenting behaviors may provide unique prediction of child anxiety sensitivity and or influence the relationship between parent and child anxiety sensitivity. Thus, parenting behaviors may have differential effects on children according to the context in which the behaviors occur (e.g., the child's stage of development, risk factors or protective factors present; Wood et al., 2003; Manassis & Bradley, 1994; Vasey & Dadds, 2001). The concept of multifinality suggests that a single risk factor can lead to multiple outcomes depending on the context in which it occurs (Cicchetti & Rogosch, 1996). For example, a child with an anxious genetic predisposition exposed to harsh and inconsistent discipline may be more likely to develop generalized anxiety disorder than would a child with an anxious genetic predisposition exposed to high levels of parental warmth and consistent discipline. The warm parent-child relationship and consistent discipline in this example would serve as moderators, buffering the child from their genetic vulnerability and decreasing their chances of developing an anxious disorder. Following the developmental psychopathological perspective, a given parenting behavior may be either protective or maladaptive for child development based on the context in which it occurs. Therefore, research examining both positive and negative parenting behaviors and their association with anxiety sensitivity in youth is warranted.

Previous research has attempted to identify the parental contribution to child anxiety sensitivity by looking at parenting styles, but very little research has examined the association between specific parenting behaviors and anxiety sensitivity. For example, a recent study by Erozkhan (2012) examined the relationship between anxiety sensitivity and parenting styles in 545

adolescents (aged 15-18 years) in different high schools in Mugla, Turkey. This study found that the three parenting styles examined (democratic, protective-demanding, and authoritarian) explained 29.1% of the total variance in anxiety sensitivity in the adolescents. The democratic, protective-demanding, and authoritarian parenting styles were all significantly correlated to anxiety sensitivity. Anxiety sensitivity was positively related to protective-demanding ( $t = 4.519, p < .001$ ) and authoritarian parenting styles ( $t = 4.841, p < .001$ ), and negatively related to democratic parenting style ( $t = -4.327, p < .001$ ).

## **2.1 Examination of Parenting Behaviors in Relation to Anxiety Sensitivity**

Three studies to date have examined specific parenting behaviors in relation to anxiety sensitivity. The first is a study by Scher and Stein (2003), which 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. Specifically, results found that parental threatening behavior (as measured by the Parent Threat Inventory; Scher, Stein, Ingram, Malcarne, & McQuaid, 2002) emerged as the sole predictor of overall anxiety sensitivity after controlling for hostile and rejecting behaviors, accounting for 6.6% ( $p < .001$ ) of variance in offspring anxiety sensitivity.

The second study to date that has specifically looked at parenting behaviors is a study by Nebbitt and Lambert (2009), which examined correlates of anxiety sensitivity among 238 African American adolescents (13-19 years of age) living in urban public housing. Results showed that parental monitoring served as a protective factor for the adolescents, attenuating

(partially mediating;  $F_{change} = 4.88, p < .001$ ) the relationship between neighborhood risk and youth anxiety sensitivity (as measured by the ASI).

The third study to date that has specifically looked at parenting behaviors is a study in which Gray and colleagues (Gray, Carter, & Silverman, 2011) examined perceived parenting acceptance and parental control behaviors in relation to child anxiety sensitivity (measured by the CASI) in a sample of 266 school-aged African American youth (aged 8-13 years,  $M_{age} = 9.88$ ). Parental acceptance was defined as parents' expression of warmth and responsiveness to children's emotions and behaviors and parental control was defined as low levels of parental encouragement of children's autonomy and independence. Results showed that high parental control was related to high levels of child anxiety sensitivity ( $B = .28, 95\% CI = .04, .51, p < .05$ ). Perceived parental acceptance was not significantly related to children's report of anxiety sensitivity.

Based upon the findings of previous research on the parental contributions of child anxiety sensitivity, it appears that simply looking at levels of parent anxiety sensitivity or parent psychopathology in relation to child anxiety sensitivity does not sufficiently account for the range of possible parental contributions to child anxiety sensitivity. Research has moved to the examination of parenting styles (Erozkan, 2012) with encouraging results. However, this study leaves questions as to the specific behaviors that may influence the development of child anxiety sensitivity. For example, "parenting style" is less precise than identifying the specific parenting behaviors that may foster anxiety sensitivity or buffer other risk factors for child anxiety sensitivity. Thus, Wood et al. (2003) have suggested it may be more productive to distinguish the specific parenting behaviors responsible.

Critically, previous research has not examined the effect of parenting behaviors on the relationship between parent and child anxiety sensitivity. The association between parent and child anxiety sensitivity is complex and likely moderated by contextual factors. In other words, parenting behaviors may be differentially related to child anxiety sensitivity depending on the parenting context. For example, positive parenting may buffer the association between parent anxiety sensitivity and child anxiety sensitivity by teaching children to regulate their emotions and cope with their fears instead of avoiding or fearing them thereby reducing the genetic risk conferred by high parent anxiety sensitivity. Positive parenting behaviors may also decrease opportunities for the child to model their parents' anxiety sensitivity or reduce the likelihood that parents display high anxiety sensitivity in front of their children. While Gray et al. (2011), Nebbitt and Lambert (2009), and Scher and Stein (2003) examined child anxiety sensitivity's association with specific parenting behaviors, none of these studies accounted for the relationship between parent anxiety sensitivity and parenting behaviors or how parenting behaviors may moderate the relationship between parent and child anxiety sensitivity.

The present study aimed to expand the literature by examining a broader spectrum of parenting behaviors than has been previously researched. In addition, incorporating the potential effects of context will enrich our understanding of the developmental pathways of anxiety sensitivity etiology. The Alabama Parenting Questionnaire was used to measure specific parenting behaviors.

### **3. Measurement of Parenting Behaviors**

As noted, six studies to date have examined parenting and child anxiety sensitivity, three of these examined the association of specific parenting behaviors with child anxiety sensitivity (Scher & Stein, 2003; Nebbitt & Lambert, 2009; Gray et al., 2011), but none of these studies have examined parenting behaviors as moderators of the link between parent anxiety sensitivity and child anxiety sensitivity. Additionally, none have measured parenting from both child and parent-report. Results thus far have been based on the child's memories of their perceived parenting or the parent's recollection of the family environment. To minimize the possibility of bias in reporting and gain a more robust understanding of the effects of parenting behaviors on the relationship between parent and child anxiety sensitivity, it would be clearly advantageous to collect data from both the parent and child perspective. The Alabama Parenting Questionnaire (APQ; Shelton, Frick, & Wootton, 1996) assesses specific parenting domains and can be administered to both the parent (parent reports about their use of parenting behaviors) and the child (child reports on the parent's use of parenting behaviors). Evidence shows the APQ reliably assesses five parenting constructs: parental involvement ( $\alpha = .64$ ), positive parenting ( $\alpha = .74$ ), poor monitoring ( $\alpha = .66$ ), inconsistent discipline ( $\alpha = .80$ ), and corporal punishment ( $\alpha = .53$ ; Hawes & Dadds, 2006). Although originally designed as a measure of risk factors for antisocial outcomes in children and adolescents, the APQ has since been used in other areas of literature to study risk factors in child psychosocial development, including research on anxiety symptoms, ADHD, internalizing problems, eating pathology, and substance use in youth (Piffner & McBurnett, 2006; Hinshaw et al., 2000; Rakow et al., 2009; Mikami, Hinshaw, Patterson, & Lee, 2008; Tildesley & Andrews, 2008).

#### **4. Potential Moderators of the Association between Child and Parent Anxiety Sensitivity**

The examination of specific parenting behaviors may help identify conditions in which parent and child anxiety sensitivity are related. Positive parenting behaviors including parental warmth, acceptance, and involvement are generally conceded to be important components of secure parent-child attachment (DeKlyen, Speltz, & Greenberg, 1998). Research shows that parental warmth is negatively associated with child anxious behavior (McCabe, Clark, & Barnett, 1999). Furthermore, parental monitoring and involvement have been shown to serve as important protective factors against psychological risk (Brookmeyer, Henrich, & Schwab-Stone, 2005). Through parental involvement and supervision, parents scaffold children's behavior and teach emotion regulation and coping strategies. Thus, children exposed to these positive parenting behaviors may be better equipped to cope with their emotional arousal, reducing their sensitivity to anxiety (Gottman, Katz, & Hooven, 1997). Bacchini, Miranda, and Affuso (2011) found that parental monitoring played a key role in moderating the relationship between youth witnessing violence and reporting feelings of anxiety and depression. Authors hypothesized that youth with high parental involvement were more likely to talk with their family about their experiences and fears and thus felt protected and less in danger as a result. Similarly, children of parents with high anxiety sensitivity may be less likely to develop high levels of anxiety sensitivity in the context of positive parenting behaviors.

Negative parenting behaviors such as threatening or controlling behaviors have been found to predict child anxiety sensitivity in previous literature, but much more research is needed to examine others aspects of negative parenting. This study adds to the current literature by examining the potential effects of three other negative parenting behaviors: poor supervision, inconsistent discipline, and corporal punishment. Low levels of parental monitoring have been

linked with increased vulnerability for the development of internalizing problems in youth (Barber, Olsen, & Shagle, 1994), specifically symptoms of anxiety (Bacchini et al., 2011). Parent-child relationships high in parental monitoring are characterized as supportive and communicative (Bacchini et al. 2011). For example, a parent who poorly supervises their child may be less likely to notice their child displaying a fearful response to their bodily arousal of fearful situations (i.e., anxiety sensitivity) and thus less likely to teach their child strategies for coping with these feelings of anxiety. Conversely, parents high in parental supervision may be more likely to notice these anxious displays of emotion in their children and communicate effective ways for handling feelings of distress, decreasing the likelihood that their child will go on to develop high levels of anxiety sensitivity over time.

Few studies have looked at parental discipline in association with children's internalizing symptoms, but preliminary evidence suggests that ineffective and harsh discipline may be a risk factor for vulnerable children. Laskey and Cartwright-Hatton (2009) found strong correlations between parental anxiety and child internalizing symptoms with harsh discipline. For example, parents who report high levels of personal anxiety are more likely to report using high levels of ineffective discipline, particularly harsh discipline techniques. Theoretically, harsh and inconsistent parental discipline may lead to a threatening and unpredictable home environment, which may be fertile grounds for the development of anxiety in a vulnerable child (i.e., a child whose parent has high anxiety sensitivity; Laskey & Cartwright-Hatton, 2009). No studies to date have examined the relationship between corporal punishment and child anxiety sensitivity. However, 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). Children who experience frequent corporal



punishment show elevated levels of the stress hormone cortisol in response to an anxiety-provoking interaction with their mothers (Bugental, Martorell, & Barraza, 2003). Therefore, in a child who views their body's response to fear as dangerous or threatening, inconsistent and harsh discipline (e.g., corporal punishment) may be especially problematic in that it amplifies their anxiety and decreases their sense of control, perpetuating the cycle of their fear.

In addition to exploring parenting behaviors as moderators of the association between child and parent anxiety sensitivity, gender was also tested as a moderating variable. Previous research by Tsao et al. (2005) found a significant association between parent and child anxiety sensitivity, but only for girls. Therefore, further study of the child's gender and its effect on the relationship between parent and child anxiety sensitivity is warranted and may explain inconsistencies in the literature.

## **5. An Alternative Model: Exploratory Analysis**

Although previous knowledge of developmental psychopathology and anxiety sensitivity suggests that parenting behaviors may moderate the association between parent and child anxiety sensitivity, an alternative explanation may be argued. In a study of 157 youths (aged 7-18 years) and their parents, Drake and Kearney (2008) found that family environment (conflict and control as measured by the Family Environment Scale; Moos & Moos, 1986) mediated the association between parent anxiety sensitivity and child anxiety. As a possible explanation for this finding, researchers suggested that family processes like conflict and control may be more salient in families of parents with psychopathology or severe anxiety sensitivity. Similarly, negative parenting factors may be more salient in parents with psychopathological anxiety or high anxiety sensitivity and thus may account for the association between parent and child anxiety sensitivity. Parents with high anxiety sensitivity are highly focused on their bodily responses to anxious symptoms, which may decrease the amount of attention they devote to their children. These parents may isolate their children from anxiety-producing social situations, provide less parental warmth, or be less likely to notice and reinforce their child's accomplishments or prosocial behavior (Drake & Kearney, 2008). These negative parenting behaviors may ultimately be contributing to high child anxiety sensitivity. Thus it is also possible that variation in the level of parent anxiety sensitivity significantly accounts for variations in parenting behaviors (presumed mediator; path a), variations in parenting behaviors (positive/negative parenting) significantly account for variations in the level of child anxiety sensitivity (path b), and when paths a and b are controlled for, the previously significant relationship between child anxiety sensitivity and parent anxiety sensitivity will be no longer significant or will be substantially reduced (see Baron & Kenny, 1986).

## **6. The Present Study**

In sum, research has yet to examine parenting behaviors as a moderator of the association between parent and child anxiety sensitivity, and additional research is needed to examine parenting's links to child anxiety sensitivity. Previous research has focused on investigating the parental contributions to child anxiety sensitivity, but little research has examined specific parenting behaviors. The present study intended to advance understanding of the development of anxiety sensitivity by investigating the effect of both positive and negative parenting behaviors (positive parenting, parental involvement, poor monitoring, inconsistent discipline, and corporal punishment) on the relationship between parent and child anxiety sensitivity. This study aimed to increment the previous literature by studying parenting behaviors as reported by multiple informants, decreasing the likelihood that the results would be influenced by inter-rater bias. Further, the present study assessed children's reports of their parent's parenting behaviors during childhood (versus assessing adult children's retrospective reports of their parents' parenting behaviors as has been done in previous studies), reducing the likelihood that memories of the parenting behaviors were distorted over time. This study also aimed to test if the relationship between parent and child anxiety sensitivity was contingent upon the child's gender as has been found in previous research (Tsao et al., 2005).

### **6.1 Hypotheses**

1. Parent anxiety sensitivity will be significantly associated with child anxiety sensitivity.
2. Parenting behaviors will moderate the association between parent anxiety sensitivity and child anxiety sensitivity.

- a. Among children with relative high negative parenting (i.e., poor monitoring, inconsistent discipline, and corporal punishment), parent anxiety sensitivity will be more strongly associated with elevated child anxiety sensitivity.
  - b. Among children exposed to positive parenting [i.e., positive parenting (e.g., praise) and high levels of parental involvement], parent anxiety sensitivity will be less strongly associated with child anxiety sensitivity because these positive parenting behaviors will provide a buffering effect, such that the potential of the child developing high anxiety sensitivity through genetic and environmental risk factors will be attenuated by the positive parenting behaviors.
3. Gender will moderate the association between parent anxiety sensitivity and child anxiety sensitivity.
4. The alternative that negative parenting behaviors will mediate the association between parent and child anxiety sensitivity will be explored. If this is the case then:
  - a. Parent anxiety sensitivity will be associated with poor monitoring, inconsistent discipline, and corporal punishment parenting behaviors.
  - b. Parent anxiety sensitivity will be associated with child anxiety sensitivity.
  - c. Poor monitoring, inconsistent discipline, and corporal punishment parenting behaviors will be associated with child anxiety sensitivity.
  - d. When parent anxiety sensitivity and parenting behaviors are both predictors of child anxiety sensitivity, the previously significant relationship between parent and child anxiety sensitivity will be no longer be significant or will be substantially reduced.

5. A final goal was to examine if the associations identified in 1-4 are specific to anxiety sensitivity or are general to anxiety.

## 7. Method

### 7.1 Participants

The sample for this study was composed of 255 youth (51.4% male) aged 6 to 17 years ( $M_{age} = 12.3$  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 1.1% did not report their family income.

### 7.2 Measures

**7.2.1 Parent Anxiety Sensitivity.** Parent anxiety sensitivity was assessed using the Anxiety Sensitivity Index (ASI; Reiss et al., 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., Taylor, 1999; Peterson & Plehn, 1999). Further, the ASI has been demonstrated to have good internal consistency (Cronbach's  $\alpha = .82$ ; 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  $\alpha = .88$ ).

**7.2.2 Child Anxiety Sensitivity.** Child anxiety sensitivity was assessed using the Children's Anxiety Sensitivity Index (CASI; Silverman et al., 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 et al. (2002a) reported strong convergent validity estimates between the ASI and the CASI ( $r = .73$ ).

in a sample of high-school youth. Weems et al. (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  $\alpha = .87$ ).

**7.2.3 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 et al., 1996). The APQ (both parent and child measures) is a 42-item self-report measure that assesses parenting practices across five domains: positive parenting, parental involvement, poor monitoring, inconsistent discipline, and corporal punishment. 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*. For 9 of the 10 items included on the parental involvement scale on the APQ-Child report, the questions are asked about the child’s mother and father separately (e.g., “your mom helps you with your homework”). As done previously in Shelton et al. (1996), analyses conducted in the present study with the parental involvement subscale tested mother parental involvement and father parental involvement separately. 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 ( $r$ ’s ranging from  $-0.01$  to  $0.23$  across APQ dimensions). Dadds,

Maujean, and Fraser (2003) found good levels of test-retest reliability in an Australian community sample of 4 to 9 year old children using the parent report form of the APQ across a 2-week period ( $n = 19$ , involvement:  $r = .87$ , monitoring/supervision:  $r = .84$ , positive techniques:  $r = .85$ , inconsistent discipline:  $r = .88$ , corporal punishment:  $r = .90$ ). In a large community sample of children aged 10 to 14 years, Essau, Sasagawa, and Frick (2006) found acceptable levels of internal consistency (above .70), with the exception of the inconsistent discipline scale (.54 and .62 for father and mother data, respectively). The current sample showed good internal consistency on both the child and parent report [i.e., child report: Cronbach's  $\alpha = .79$  (positive parenting), .79 (mother parental involvement), .85 (father parental involvement), .76 (poor monitoring), .61 (inconsistent discipline), .77 (corporal punishment); parent report: Cronbach's  $\alpha = .82$  (positive parenting), .80 (parental involvement), .79 (poor monitoring), .75 (inconsistent discipline), and .85 (corporal punishment)].

**7.2.4 Anxiety Symptoms.** Anxiety symptoms were assessed using the Revised Child Anxiety and Depression scales (RCADS; Chorpita, Yim, Moffitt, Umemoto, & Francis, 2000; Spence, 1997). The RCADS is an adaptation of the Spence Children's Anxiety Scale (SCAS; Spence, 1998). The RCADS is a 47-item instrument that assesses symptoms of each anxiety disorder (except posttraumatic stress disorder and specific phobias) and depression based on the *Diagnostic and Statistical Manual of Mental Disorders–IV (DSM-IV)* criteria (American Psychiatric Association, 1994). 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 total anxiety score (Cronbach’s  $\alpha = .92$ ) and child total anxiety score (Cronbach’s  $\alpha = .93$ ).

### **7.3 Procedure**

Data from this study were collected by the Youth and Family Anxiety, Stress, and Phobia Lab of the University of New Orleans (UNO). 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, physician’s offices, etc.) and to students enrolled in UNO classes. Only families who completed both the parent and child report of the Alabama Parenting Questionnaire were selected for inclusion in this study. Both the youth and the parent were greeted 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 completed the questionnaires and 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.

### **7.4 Data Analytic Strategy**

Sixty-four families in the sample participated with more than one child (up to four children per family). In cases when multiple children participated from a family, parents completed parenting measures (APQ) about each child ( $n = 255$ ). Parents completed the ASI only in regard to their own anxiety sensitivity (ASI;  $n = 191$ ). Thus, children were nested within families, introducing the possibility of effects due to shared family variance into the model. This

dependency in the data was handled by testing hypotheses with hierarchical linear modeling (HLM) which accommodates the nested nature of the dataset and does not assume that individual observations are independent or that error terms are uncorrelated (Bryk & Raudenbush, 1992). In the HLM models tested, the identifying variable across Level 1 and 2 was the family number (i.e., the parent and all children of that parent received a single unique family identification number). 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; moderation was tested by the significance of the effects of the ASI on Level 1 associations.

## 8. Results

### 8.1 Preliminary Examination of Study Variables

The mean score, standard deviation, range, and skew for each measure are presented in Table 1.

Table 1. *Means, Standard Deviations, Ranges, and Skew for Measures*

	<i>n</i>	<i>M</i>	<i>SD</i>	Range	Skew
CASI total	253	29.04	6.99	34	5.25
ASI total	191	35.23	11.25	54	3.43
APQ-C					
Positive parenting	255	22.48	4.83	24	-2.92
M Parental Involvement	255	34.26	7.40	40	-0.13
F Parental Involvement	238	27.21	10.07	60	1.84
Poor Monitoring	255	20.34	6.66	31	3.92
Inconsistent Discipline	255	14.01	4.23	21	2.01
Corporal Punishment	254	5.05	2.74	12	10.49
APQ-P					
Positive Parenting	239	25.52	3.66	15	-4.45
Parental Involvement	239	38.90	5.77	28	-1.85
Poor Monitoring	239	16.26	5.83	39	13.45
Inconsistent Discipline	239	14.55	4.16	22	2.69
Corporal Punishment	239	5.06	2.36	12	7.85
RCADS-C anxiety	250	62.71	15.96	81	4.87
RCADS-P anxiety	254	51.81	10.55	55	9.08

Note: APQ-C = Alabama Parenting Questionnaire- Child Report, subscales: M Parental Involvement = Mother

Parental Involvement, F Parental Involvement = Father Parental Involvement; APQ-P = Alabama Parenting

Questionnaire- Parent Report; RCADS-C anxiety = Revised Child Anxiety and Depression Scales- Child Report

(sum of anxiety subscales); RCADS-P anxiety = Revised Child Anxiety and Depression Scales- Parent Report (sum of anxiety subscales).

As shown above in Table 1, the APQ poor monitoring sum score (child and parent report), corporal punishment score (child and parent report), ASI total score, CASI total score, and the RCADS scales (i.e., RCADS-P and RCADS-C) were positively skewed, and the positive parenting score (parent report) was negatively skewed. Because of the skew, several steps were taken to ensure that the uneven distributions did not affect conclusions. This included supplementing parametric analyses with non-parametric alternatives (Spearman correlations supplemented Pearson's correlations) and testing the findings using data transformations. Where findings did not differ, results of the non-transformed variables are reported. The APQ poor monitoring sum score (child report), ASI total score, CASI total score, RCADS-C score, and positive parenting score (parent report) were moderately skewed and therefore corrected using square root transformations. The square root transformations corrected the skew of the poor monitoring sum score, ASI score, and positive parenting score. However, the CASI total score and RCADS-C score still remained slightly positively skewed and so, alternatively, a logarithm transformation was applied to these two variables which successfully reduced their skewness. The poor monitoring sum score (parent report), corporal punishment scores (child and parent report), and RCADS-P score were substantially positively skewed and therefore transformed using a log transformation as well. Although the log transformation improved the distribution of these variables, the variables were still slightly positively skewed.

## **8.2 Hypothesis 1: Parent Anxiety Sensitivity Would be Associated with Child Anxiety Sensitivity.**

The correlations between the ASI and the other measures (in Table 2 and 3) were run with the sample size of 191 given the nature of the data and then confirmed via HLM where the

pattern of zero order associations were the same. Associations among other variables (in Table 2 and 3) were run with the full sample size ( $n = 255$ ). Pearson's correlations are reported in Table 2 and the Spearman correlations are reported in Table 3.

Table 2. *Pearson's Correlations for Measures*

	1	2	3	4	5	6	7	8	9	10	11	12
1. ASI total												
2. CASI total	.01											
3. APQ-C Positive Parenting	-.05	.02										
4. APQ-C Parental Involvement (M)	-.01	.04	.71**									
5. APQ-C Parental Involvement (F)	-.15*	-.10	.41**	.51**								
6. APQ-C Poor Monitoring	.06	-.02	-.19**	-.12	-.15*							
7. APQ-C Inconsistent Discipline	.05	.09	.04	.12	<-.01	.49**						
8. APQ-C Corporal Punishment	.03	.30**	.02	-.02	-.03	.01	.04					
9. APQ-P Positive Parenting	-.10	.07	.40**	.28**	.02	-.14*	.01	.11				
10. APQ-P Parental Involvement	-.05	.04	.33**	.37**	.13	-.14*	.02	.04	.64**			
11. APQ-P Poor Monitoring	.12	-.04	-.09	-.12	-.07	.26**	.08	-.09	-.20**	-.18**		
12. APQ-P Inconsistent Discipline	.28**	-.03	.01	.06	.06	.13*	.25**	.02	-.09	-.02	.44**	
13. APQ-P Corporal Punishment	.04	.19**	.11	<-.01	.04	-.06	-.12	.50**	.08	.03	.15*	.16*
14. RCADS-C anxiety	-.01	.72**	-.06	-.05	-.12	.03	.09	.26**	.05	.01	<.01	.02
15. RCADS-P anxiety	.25**	.04	.08	.07	-.05	-.04	.11	-.02	<.01	.01	.04	.26**
16. Child's Age	.11	-.19**	-.18**	-.10	-.14*	.38**	.15*	-.39**	-.24**	-.10	.38**	.04
17. Child's Gender	.08	.16*	.10	.06	-.10	-.08	.10	-.09	<-.01	0	.04	.09

Table 2 (continued).

	13	14	15	16
14. RCADS-C anxiety	.19**			
15. RCADS-P anxiety	<.01	.18**		
16. Child's Age	-.33**	-.16*	-.05	
17. Child's Gender	-.02	.17**	.11	.05

Note: \*\*  $p < .01$  level, \*  $p < .05$  level. APQ-C = Alabama Parenting Questionnaire- Child Report; APQ-P = Alabama Parenting Questionnaire- Parent Report, subscales: PP = positive parenting; PI = parental involvement; (M) PI = mother parental involvement; (F) PI = father parental involvement; PM = poor monitoring; ID = inconsistent discipline; CP = corporal punishment; RCADS-C anxiety, Revised Child Anxiety and Depression Scales- Child Report (sum of anxiety subscales); RCADS-P anxiety, Revised Child Anxiety and Depression Scales- Parent Report (sum of anxiety subscales).

Table 3. *Spearman Correlations for Measures*

	1	2	3	4	5	6	7	8	9	10	11	12
1. ASI total												
2. CASI total	.02											
3. APQ-C Positive Parenting	-.06	<-.01										
4. APQ-C Parental Involvement (M)	-.02	.03	.70**									
5. APQ-C Parental Involvement (F)	-.14	-.09	.40**	.51**								
6. APQ-C Poor Monitoring	.04	<.01	-.19**	-.10	-.12							
7. APQ-C Inconsistent Discipline	.10	.12	.03	.13*	-.01	.48**						
8. APQ-C Corporal Punishment	.02	.26**	<.01	-.06	-.04	.02	.01					
9. APQ-P Positive Parenting	-.12	.09	.39**	.26**	<-.01	-.17**	-.02	.09				
10. APQ-P Parental Involvement	-.06	.03	.34**	.37**	.12	-.16*	.02	.03	.63**			
11. APQ-P Poor Monitoring	.13	-.02	-.12	-.10	-.12	.36**	.10	-.15*	-.34**	-.29**		
12. APQ-P Inconsistent Discipline	.30**	-.01	<-.01	.07	.04	.15*	.23**	.01	-.15*	-.04	.33**	
13. APQ-P Corporal Punishment	.10	.19**	.08	-.02	.04	-.06	-.09	.55**	.06	<.01	-.05	.09
14. RCADS-C anxiety	.03	.72**	-.03	-.02	-.11	.06	.14*	.25**	.04	-.01	.04	.05
15. RCADS-P anxiety	.27**	.05	.05	.07	-.03	<.01	.10	-.01	-.06	-.05	.06	.30**
16. Child's Age	.11	-.14*	-.19**	-.09	-.15*	.41**	.17**	-.39**	-.26**	-.12	.45**	.05
17. Child's Gender	.08	.16*	.12*	.07	-.08	-.07	.08	-.15*	<.01	.01	.03	.10



Table 3 (continued).

	13	14	15	16
14. RCADS-C anxiety	.20**			
15. RCADS-P anxiety	.07	.22**		
16. Child's Age	-.36**	-.13*	-.06	
17. Child's Gender	-.05	.16*	.13*	.06

Note: \*\*  $p < .01$  level, \*  $p < .05$  level. APQ-C = Alabama Parenting Questionnaire- Child Report; APQ-P = Alabama Parenting Questionnaire- Parent Report, subscales: PP = positive parenting; PI = parental involvement; (M) PI = mother parental involvement; (F) PI = father parental involvement; PM = poor monitoring; ID = inconsistent discipline; CP = corporal punishment; RCADS-C anxiety, Revised Child Anxiety and Depression Scales- Child Report (sum of anxiety subscales); RCADS-P anxiety, Revised Child Anxiety and Depression Scales- Parent Report (sum of anxiety subscale).

As shown in Tables 2 and 3, 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<sup>2</sup>. Parent anxiety sensitivity was significantly positively associated with inconsistent discipline parenting behavior (parent report) and the child's anxiety symptoms (RCADS-parent report of anxiety scales). 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 of anxiety scales). Age was also negatively associated with child's anxiety symptoms (child report), positive parenting (child and parent report), parental involvement (child report of father involvement), corporal punishment (child and parent report), and positively associated with poor monitoring (child and parent report) and inconsistent discipline (child report).

In terms of informant, significant positive associations were found between parent and child reports of positive parenting, parental involvement, poor monitoring, inconsistent discipline, corporal punishment, and child anxiety symptoms (RCADS) as can be seen in Tables 2 and 3. Both informants also reported significant associations between positive parenting and parental involvement (positive association), between poor monitoring and inconsistent discipline (positive association), and between positive parenting and poor monitoring (negative association).

As can be seen in Tables 2 and 3, there were a few differences between the Spearman and Pearson's correlations. However, these differences were primarily in the associations between two parenting behaviors [i.e., Spearman correlations found a significant negative association

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<sup>2</sup> 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.

between positive parenting (parent report) and inconsistent discipline (parent report) but Pearson's correlation was not significant], and do not affect conclusions regarding study hypotheses. One relevant difference was a significant positive association between inconsistent discipline (child report) and child's anxiety symptoms (child report) reported by the Spearman correlation that was not significant in Pearson's correlation between the two measures. Thus, when testing hypotheses in HLM, transformed versions of the variables were also tested. In general, the pattern of findings was similar and conclusions identical and so the analyses reported focus on the non-transformed versions.

### **8.3 Hypothesis 2 and 3: Parenting Behaviors and Gender Would Moderate the Association Between Parent and Child Anxiety Sensitivity.**

Parenting behaviors and the child's gender were next examined as potential moderators with multilevel modeling analyses using HLM 7 (Raudenbush et al., 2011; see also Bryk & Raudenbush, 1987, 1992), to account for the nesting of child variables within the parent report of ASI. Specifically, the 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 0 = boy and 1 = girl) as Level 1 predictors, ASI total score (grand-mean centered to reduce multicollinearity; Tabachnick & Fidell, 2007) as the Level 2 variable, and CASI total score as the outcome variable. Each APQ subscale (positive parenting, parental involvement, poor monitoring, inconsistent discipline, and corporal punishment from both the parent and child report) was tested in a separate model as a Level 1 predictor. As depicted in Table 4, results of the analysis with robust standard errors indicated that the child's age was a significant predictor of child anxiety sensitivity scores [coefficient = -0.44,  $t(247) = -3.09$ ,  $p < .05$ ]. Results also indicated that gender [coefficient = 0.18,  $t(247) =$

2.33,  $p < .05$ ] significantly interacted with parent anxiety sensitivity to predict child anxiety sensitivity, such that there was a positive association in girls and a negative association in boys (see Figure 1). 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 (Table 4) 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 (see Figure 2)<sup>3</sup>.

Table 4. Hierarchical Linear Modeling of Moderation

Fixed Effect	Coefficient	SE	t-ratio	df	p-value
Intercept, $\beta_0$					
Intercept, $\gamma_{00}$	31.94	3.00	10.65	187	<0.001
ASITOT, $\gamma_{01}$	-0.05	0.28	-0.18	187	0.861
Gender slope, $\beta_1$					
Intercept, $\gamma_{10}$	2.75	0.89	3.11	247	0.002
ASITOT, $\gamma_{11}$	0.18	0.08	2.33	247	0.021
Age slope, $\beta_2$					
Intercept, $\gamma_{20}$	-0.44	0.14	-3.09	247	0.002
ASITOT, $\gamma_{21}$	0.02	0.01	1.21	247	0.226
Positive parenting child report slope, $\beta_3$					
Intercept, $\gamma_{30}$	-0.08	0.09	-0.89	187	0.374
ASITOT, $\gamma_{31}$	-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<sub>ij</sub>* =  $\gamma_{00}$  +  $\gamma_{01}$ \**Parent anxiety sensitivity index score<sub>j</sub>* +

<sup>3</sup> Significant HLM findings remained when excluding fathers ( $n = 14$ ) from the sample.

$\gamma_{10} * Gender_{ij} + \gamma_{11} * Parent\ anxiety\ sensitivity\ index\ score_j * Gender_{ij} + \gamma_{20} * Age_{ij} + \gamma_{21} * Parent$   
 $anxiety\ sensitivity\ index\ score_j * Age_{ij} + \gamma_{30} * Positive\ parenting\ child\ report_j + \gamma_{31} * Parent\ anxiety$   
 $sensitivity\ index\ score_j * Positive\ parenting\ child\ report_{ij} + u_{0j} + u_{3j} * Positive\ parenting\ child$   
 $report_{ij} + r_{ij}.$

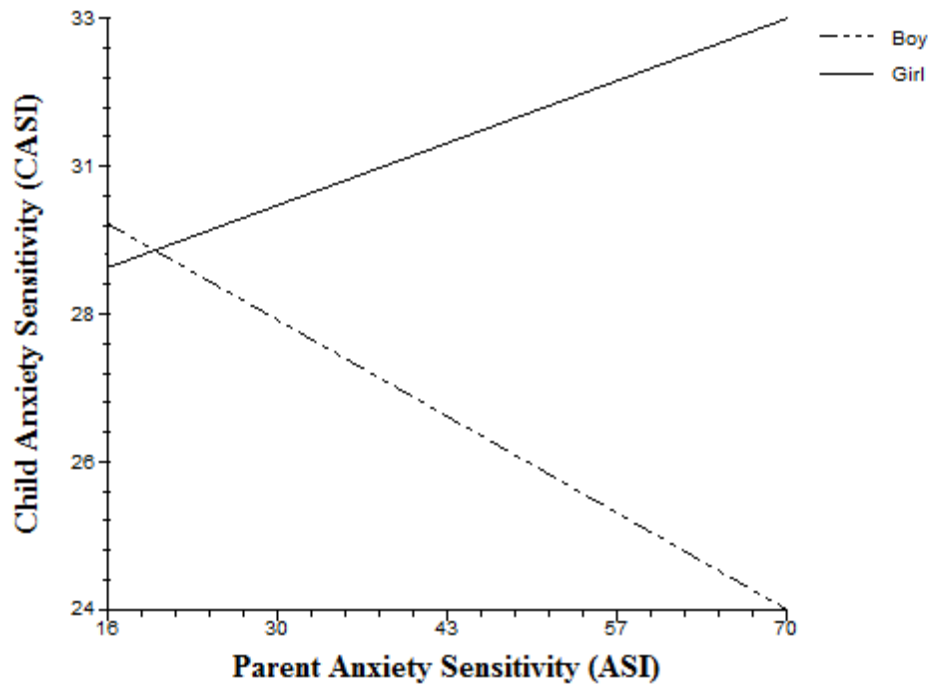


Figure 1. Gender Moderating the Relationship between Parent Anxiety Sensitivity (ASI) and Child Anxiety Sensitivity (CASI) Positively Predicting for Girls and Negatively Predicting for Boys.

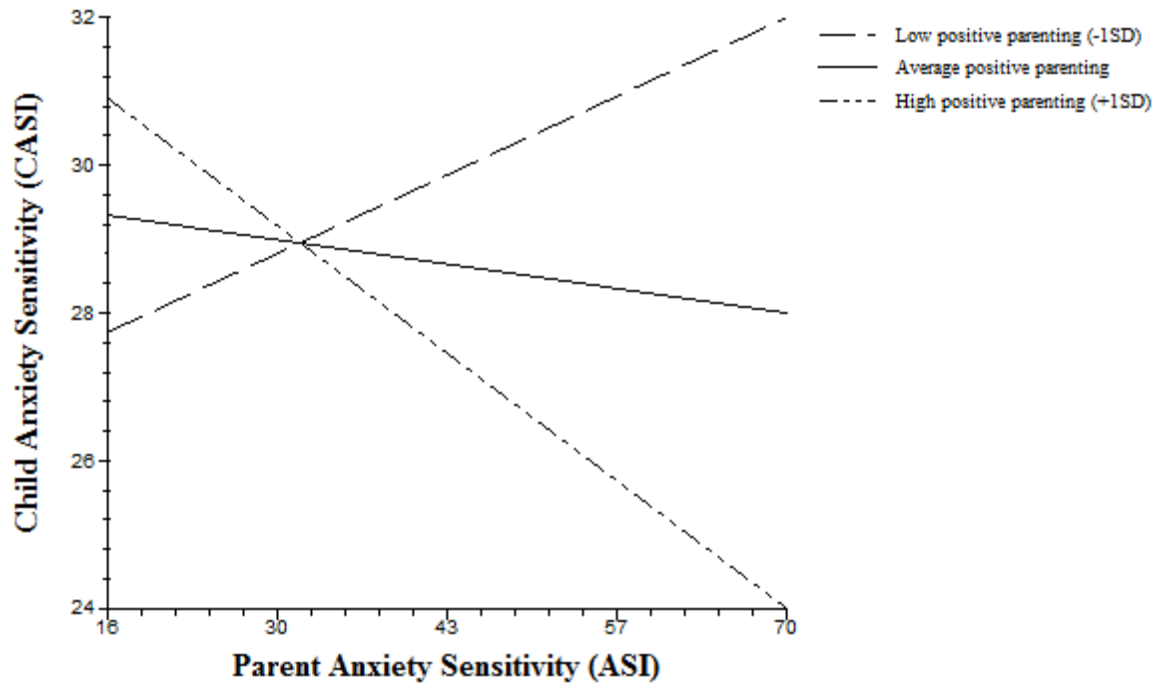


Figure 2. Positive Parenting Moderating the Relationship between Parent Anxiety Sensitivity (ASI) and Child Anxiety Sensitivity (CASI) for Low Positive Parenting (-1 SD below the Mean), Average Positive Parenting (Mean), and High Positive Parenting (+1 SD above the Mean) Based on APQ-C Positive Parenting subscale

Identical HLM models were run with each of the various parenting variables as moderators and results did not show any of the other parenting behaviors (as reported by the child or parent) to moderate the association between parent and child anxiety sensitivity. There was, however, a significant main effect of corporal punishment (child report) as a predictor of child anxiety sensitivity [coefficient = 0.72,  $t(187) = 4.49$ ,  $p < .001$ ]. Parent report of corporal punishment also became a predictor of child anxiety sensitivity [i.e., significant main effect; coefficient = 0.49,  $t(187) = 2.13$ ,  $p < .05$ ] when the ASI, CASI, and corporal punishment scores were transformed.

#### **8.4 Hypothesis 4 (Exploratory Analysis): Parenting Behaviors Would Mediate the Association Between Parent and Child Anxiety Sensitivity.**

The critical first condition of mediation was not met (i.e., there was a lack of a significant main effect association between parent anxiety sensitivity and child anxiety sensitivity).

Moreover, parent ASI scores were not consistently associated with parenting behaviors and only corporal punishment was associated with child CASI scores, suggesting little or no evidence for a mediation model.

#### **8.5 Hypothesis 5: Associations Unique to Anxiety Sensitivity.**

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<sup>4</sup>.

### **9. Discussion**

The present study advances the understanding of the development of anxiety sensitivity and adds to the existing research on the relationship between anxiety sensitivity and parenting behaviors in several ways. Consistent with the hypothesis that positive parenting would moderate the association between parent and child anxiety sensitivity, findings indicated that positive parenting behaviors provided a buffer for children at-risk for developing high anxiety sensitivity.

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<sup>4</sup> 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 (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.

In other words, the child's perception of their parent as using positive parenting techniques reduced the risk conferred by having a parent with high anxiety sensitivity (i.e., genetic predisposition, parental modeling of hyper-vigilance to their bodily feelings of anxiety). Theoretically, there are several reasons why positive parenting moderates 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.

As hypothesized, gender was 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 is consistent with Tsao et al. (2005) who also found a relationship between parent and child anxiety sensitivity but only in girls. 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 toy in which they witnessed their mother showing a negative face to a fear relevant toy (i.e., a spider or snake), 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 respond more to their parent of the same sex, 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 also the first study to show that corporal punishment was found to be a predictor of 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 ( $\alpha = .53$ , 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 (i.e., the level of corporal punishment did not affect individuals’ change in anxiety sensitivity over time). However, this may be due to the fact that parents are less likely to use corporal punishment as a disciplinary technique with older children.

The present study also advances the literature by assessing parenting behaviors through multiple informants (i.e., parent and child), which is a limitation of previous research. Since the APQ is available in a parent and child version, the agreement between the parent and child

reports of the parenting behaviors were able to be compared with correlations. Significant positive associations were found between parent and child reports of all five of the APQ subscales (positive parenting, parental involvement, poor monitoring, inconsistent discipline, corporal punishment) as well as child anxiety symptoms (RCADS). Both informants also reported significant associations between positive parenting and parental involvement and between poor monitoring and inconsistent discipline. A negative association between positive parenting and poor monitoring was found in child report only. Therefore, although there were differences between the parent and child's perspective of their (or their parent's, respectively) parenting behaviors (e.g., a negative association between positive parenting and poor monitoring was found in child report only), the two reporters showed the same overall general trends in their reporting.

In contrast with the first hypothesis, study results indicated that parent anxiety sensitivity and child anxiety sensitivity were not significantly associated. However, previous research has often found the association between parent and child anxiety sensitivity to be contingent upon other factors, which was the case in the present study.

No other parenting behaviors examined were found to moderate the association between parent and child anxiety sensitivity. Although previous literature has found that negative parenting behaviors such as controlling and threatening parenting lead to higher child anxiety sensitivity (main effect), this study suggests that the negative behaviors analyzed in this study (poor monitoring, inconsistent discipline) do not interact with parental anxiety sensitivity to predict child anxiety sensitivity.

Another goal of this study was to examine the alternative hypothesis that parenting behaviors would mediate the relationship between parent anxiety sensitivity and child anxiety

sensitivity. However, because no association was found between parent anxiety sensitivity and child anxiety sensitivity in addition to the fact that parent anxiety sensitivity scores were not consistently associated with parenting behaviors (only inconsistent discipline- parent report) and that child anxiety sensitivity scores were not consistently associated with parenting behaviors (only corporal punishment), a mediation conclusion was unviable from the set of findings in this study.

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. 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 what factors may moderate this possible relationship await further study.

Along with the considerations of these limitations, this study does provide important information about the effect of parenting behaviors on the association between parent and child anxiety sensitivity. 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 behaviors that have not been previously looked at in relation to anxiety sensitivity (i.e., corporal punishment, inconsistent discipline) 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 allowed for a more robust and reliable

view of parenting behaviors from both the parent and child perspective. In addition, because the study was not retrospective in nature as were most previous studies in this literature, 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 (i.e., dependency in the dataset; non-independent observations) 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.

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. 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 can be used to distinguish 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 future anxiety disorders in general.

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