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The effect of parent anxiety and emotion regulation on parenting behaviors

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The effect of parent anxiety and emotion regulation on parenting behaviors

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The student author, whose presentation of the scholarship herein was approved by the program of study committee, is solely responsible for the content of this thesis. The Graduate College will ensure this thesis is globally accessible and will not permit alterations after a degree is conferred.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

NOMENCLATURE

ADHD	Attention Deficit Hyperactivity Disorder
ANS	Autonomic Nervous System
APQ	Alabama Parenting Questionnaire
BSI	Brief Symptom Inventory
DERS	Difficulty in Emotion Regulation Scale
EKG	Electrocardiogram
HF	High Frequency
HRV	Heart Rate Variance
LF	Low Frequency
STAI	State Trait Anxiety Inventory

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ABSTRACT

Parenting behaviors play an important role in healthy youth development and poor parenting behaviors place youth at risk of developing problem behaviors, mental health problems, and difficulties in emotional self-regulation. Parenting behaviors are influenced by parents' psychological well-being and their ability to regulate their own emotions. This study seeks to identify the role of anxiety, emotion regulation abilities via self-report and high frequency heart rate variance (HF-HRV), and the interaction between anxiety and emotion regulation in predicting parenting behaviors. The main goal of this study was to determine if emotion regulation strengthens and/or buffers the relationship between parent psychopathology and poor parenting behaviors. Eighty caregivers completed self-report measures of parenting behaviors, anxiety, and emotion regulation, while HF-HRV was additionally measured in 74 of the caregivers during a resting state and stress task.

Three significant moderating effects of HF-HRV stress reactivity emerged. Trait anxiety by low HF-HRV reactivity predicted both negative parenting practices and poor monitoring, and somatization by low HF-HRV reactivity predicted poor monitoring. No significant findings emerged for self-reported emotion regulation. Findings suggested that poor emotion regulation, as indexed by physiological reactivity to stress, may strengthen the relationship between parent psychopathology and poor parenting behaviors. This study did not find a buffering effect of optimal emotion regulation abilities on the relationship between anxiety and parenting.

CHAPTER 1. INTRODUCTION

Parenting behaviors play an important role in healthy youth development and are associated with children's socialization and psychological adjustment (Baumrind, 1967; Castro-Schilo et al., 2013; Eisenberg, Cumberland, & Spinrad, 1998). Parents and caregivers are the central source of care for the child during the early years of life and substantial literature finds positive parenting promotes the most optimal psychosocial outcomes in youth across the life span (Alonso-Stuyck, 2019; Lamborn, Mounts, Steinberg, & Dornbusch, 1991; Steinberg, 2001; Steinberg & Silk, 2001). In contrast, poor parenting behaviors place youth at risk of developing mental health problems, other problem behaviors, and contribute to youth's difficulties in emotional self-regulation. Development of emotional self-regulation is fostered by a parents' own ability regulate physiological arousal and emotions (Shonkoff & Phillips, 2000) and parents socialize children through responsive parenting behaviors (Morris, Silk, Steinberg, Myers, & Robinson, 2007; Denham et al., 2000). Poor parenting behaviors, such as unresponsiveness, poor monitoring and supervision, and excessive use of corporal punishment may foster adverse psychological and social outcomes (Bierman and Smoot, 1991). Research has also shown that parents with anxiety disorders (Hirshfeld, et al., 1997; Turner & Biedel, 2003; Whaley, Pinto, & Sigman, 1999), depression, (Lovejoy, Graczyk, O'Hare, & Neuman, 2000; Taraban et al., 2018; Wilson & Durbin, 2010), and/or substance abuse (Frick et al., 1992; Sher, Walitzer, Wood, & Brent, 1991) are at risk for using poor parenting strategies.

Given the link between parent emotional disorders such as anxiety on parenting, it is theoretically important to identify the conditions or moderators that strengthen or weaken the link between parent psychopathology and parenting. For example, there are a number of different facets of anxious emotion (trait anxiety, existential anxiety, etc.). Are they all equally associated with different parenting styles? For example, is generalized or trait anxiety equally linked to poor parenting as existential anxiety? Moreover, poor parental emotion regulation is a risk factor for poor parenting (Buckholdt, Parra, & Jobe-Shields, 2014; Deater-Deckard et al., 2010) and so may exacerbate the link between parent anxiety and poor parenting. In other words, the combination of poor emotion regulation and high levels of anxiety may lead to poor parenting. In combination with self-reported emotional states, emotion regulation as indexed by heart rate variability (HRV), a well-known measure of physiological emotion regulation, has previously been identified to have a moderating effect on parents' mental health symptoms and parents' behaviors. For example, Connell, Hughes-Scalise, Klostermann, & Azem (2011) found an association between parents' depression and parenting behaviors; however, no research has tested the moderating relationship of HRV on the link between multiple facets of parents' anxiety symptoms and their parenting behaviors. This study tests if there is a relationship between parent anxiety symptoms and various parenting behaviors and if these links are moderated by emotion regulation as indexed by HRV and self-reported behaviors. In the following sections, the empirical and theoretical basis for the study is developed.

CHAPTER 2. PARENTING

In his bioecological model, Bronfenbrenner (1979) proposes that proximal processes drive human development and influence human behavior. He defined these proximal processes as the “progressively more complex reciprocal interaction between an active, evolving biopsychological human organism and the persons, objects, and symbols in its immediate external environment” (Bronfenbrenner & Morris, 1998, p. 996). A dominant theme in developmental research is the influence of environmental factors, and in the context of child development, parents and their parenting behaviors act as proximal processes that have effects on children’s development, including physical, cognitive, and affective outcomes (Garbarino and Crouter, 1978; Grusec, Rudy, and Martini, 1997; Gryczkowski, Jordan, and Mercer, 2009). Baumrind’s (1966, 1991) classification of four major types of parenting styles have provided a foundation for observing associations between parenting and child outcomes for decades. Her typological classification of authoritative, authoritarian, permissive, and neglectful parenting styles have been linked to a variety of behavioral and psychosocial functioning. However, recent research has looked to refining methods of assessing parenting (Darling & Steinberg, 1993). This can be achieved by using a broader range of scales that capture more specific parenting practices.

An area of uncertainty in parenting research comes from determining which typological parenting practices lead to certain child outcomes, as parenting practices are widely variable and, globally, parents differ in the way they care for their children. Furthermore, a combination of positive parenting and negative parenting behaviors can lead to a myriad of developmental outcomes in children (Frick, Christian, & Wootton, 1999) and these combinations may not be fully captured from a typological approach. One measure developed to address the broad assessment of parenting behaviors and evaluate specific domains of parenting is the Alabama

Parenting Questionnaire (APQ) (Frick, 1991). The APQ measures styles of good and poor parenting by assessing parenting practices with five subscales: involvement, positive parenting, poor monitoring/supervision, inconsistent discipline, and corporal punishment. Parent involvement is measured by if and how often the parent engages with his or her child; some examples include asking the child about his or her day, sharing activities through games, sports, or other fun play, and talking to the child about his or her friends. Positive parenting measures types of positive reinforcement given to the child, such as through verbal ("good job") or physical (hugs) praise. Poor monitoring and supervision are assessed by if and how often the child is away from home, such as staying out after dark without an adult or being at home without adult supervision. Inconsistent discipline occurs when a child is able to talk his or her parent out of a punishment or when the child receives punishment dependent on the parent's mood. Corporal punishment is measured by how often the parent physically or verbally reprimands their child through spanking, slapping, and/or yelling and screaming if the child has done something wrong.

Previous literature on parenting techniques and child outcomes finds poor monitoring and supervision, inconsistent discipline, and corporal punishment are associated with higher rates of problem behaviors in children (Griffin, Botvin, Scheier, Diaz, & Miller, 2000; Loeber et al., 1998). The most optimal parenting techniques include high levels of parental involvement and positive parenting (i.e. positive reinforcement) and low levels of poor monitoring and supervision, inconsistent discipline, and corporal punishment (Capaldi & Patterson, 1992; see review by Rothbaum & Weisz, 1994). Parenting techniques that have been found to be most optimal are associated with child executive functioning (Sosic-Vasic et al., 2017), prosocial behavior (Gryczkowski, Jordan, & Mercer, 2017; Houltberg, Morris, Cui, Henry, & Criss, 2014), and can act as a buffer between the child and stress outside of the family (Romero, Hall, Cluver, & Meinck, 2018).

The APQ has been widely used to test associations between parent behaviors and problem behaviors in children. Poor parenting practices of low support and involvement, inconsistent discipline, poor monitoring, and severe corporal punishment have been linked to negative developmental outcomes for children, such as general externalizing problems (Gryczkowski, Jordan, & Mercer, 2009), internalizing behaviors (Burlaka, Kim, Crutchfield, Lefmann, & Kay, 2017), adjustment problems (Cheung, Boise, Cummings, & Davies, 2018) and conduct disorders (Dadds, Maujean, & Fraser, 2003). In the context of corporal punishment and in accordance with social learning theory, exposure to parental aggression can promote aggressive behaviors in youth, create scripts that rely on aggression for problem-solving, and may be generalizable to youth's other interpersonal situations (Bandura, 1977).

Determining what predicts optimal versus poor parenting can help aid in the development or improvement of parenting interventions. In line with Bronfenbrenner's (1986) bioecological model, parent cognitions and behaviors are speculated to be shaped from external systems, as families are influenced by larger social contexts via dynamic interaction with their environment. Communities, culture, neighborhoods, and socioeconomic status effect the parents' behavior through constant shifting and evolving (Garbarino, Bradshaw, & Kostelny, 2005; LeVine, 1988). What may be an acceptable parenting behavior in one culture may not translate to other cultures, and effects on child development may be different between these groups. Alongside external influences, internal processes such as parents' own parental beliefs, personality, attitudes, perceptions, and expectations play a part in determining how patterns of parenting behaviors are formed (Okagaki & Bingham, 2005; Vondra, Sysko, and Belsky, 2005). Parent characteristics and cognitions are also often shaped from their developmental experiences in their own families of origin (Main, Kaplan, and Cassidy, 1985) and by their present social networks (Sheldon, 2002).

In conclusion, there are many facets of parenting linked to both positive and negative outcomes. Independent of contextual influences, parent's anxiety symptoms have been an area of focus as predictors of parenting behaviors. Previously, parental anxiety has been linked to maternal negative control, inconsistent parenting practices, and maternal overprotection (Spieker et al., 1999; Barry, Dunlap, Lochman, & Wells, 2009; Root, Hastings, & Rubin, 2016). However, anxiety is multifaceted and different types of anxiety may uniquely predict a wide range of parenting behaviors. Additionally, a parent's ability to regulate their anxious emotions may affect any association between parent's anxiety and their parenting behaviors. In the next section, a summary of the literature establishing the relationship between parents' anxiety symptoms and parenting is presented, followed by a review of the different facets of anxiety and the role of emotion regulation between anxiety and parenting behavior.

Parent Anxiety and Link to Parenting

Parents who experience high levels of negative affect, such as anxiety and stress, may exhibit behaviors towards their children that are hostile, critical, intrusive, and/or coercive (Lovejoy, Graczyk, O'Hare, and Neuman, 2000). Research suggests that parents who meet criteria for an anxiety disorder tend to differ in their parenting style from parents who do not meet criteria (Whaley, Pinto, & Sigman, 1999). In clinical samples of anxious parents (measured as an aggregate of symptoms), findings have indicated that anxious parents may be more intrusive (Ginsburg et al., 2004; van der Bruggen et al., 2010), be less granting of autonomy (Whaley, Pinto, & Sigman, 1999) and display less warmth and support (Drake and Ginsburg, 2011; Ginsburg et al., 2004; Murray et al., 2012) and show more passive, withdrawn behaviors with low encouragement and autonomy promotion (Murray et al,, 2012) compared to their non-anxious control counterparts. In addition, some studies suggest that anxious parents may engage in more behavioral control, be less nurturing, and be overprotective of their children (Ginsburg et al., 2004; Lindhout et al., 2006).

With regards to specific facets of anxiety, socially anxious parents have been found to display unique parenting behaviors; given the difficulties in self-expression in relationships and negative judgment of ambiguous social situations, socially anxious parents tend to be less warm and display more negativity when interacting with their children compared to non-socially anxious mothers (Budinger et al., 2013). Socially anxious mothers have also been found to be less encouraging of their infant's exploration (compared to control mothers) (Murray et al., 2007) and express more anxiety while interacting with their children compared to mothers with generalized anxiety disorder in context-specific tasks (Murray et al., 2012). In a study by Cui et al. (2019), parents' anxiety was related to helicopter, or overprotective, parenting. Additionally, studies that link traits related to anxiety (via through neuroticism) have found that parents who are high neuroticism show more power assertion, less responsiveness, more insensitive behaviors, and have more overprotective parenting beliefs (Belsky et al, 1995; Clark & Ladd, 2000; Coplan et al., 2009). However, there are inconsistencies in findings, as other studies have not found a link between parental anxiety or neuroticism and parental control (Bornstein et al., 2011; Costa & Weems, 2005). One reason for inconsistencies may be the specific types of anxiety assessed and how they are linked to different types of parenting behaviors (Murray et al., 2012).

In addition to examining specific relationships between different types of parent anxiety and specific parenting behaviors, as noted above, it is theoretically important to identify the conditions or moderators that *strengthen* or *buffer* the relationship between parent anxiety and parenting behaviors. Emotion dysregulation in the parent may be a precursor to certain negative parenting practices, as parental emotion dysregulation is a risk factor for poor parenting (Buckholdt, Parra, Jobe-Shields, 2014; Giuliano, Skowron, & Berkman, 2015). In support of the idea for emotion regulation as a moderator of emotions and behavior, one study by Root, Hastings, and Rubin (2016) administered the *Revised Cheek and Buss Shyness Scale* (Cheek and Buss, 1981), the *Leary Interaction Anxiousness Scale* (Leary and Kowalski, 1993), and measures derived from the *Child-Rearing Practices Report Q-Sort* (Block, Block, & Morrison, 1981) to a sample of 66 mothers (*M age* = 33.51 years, *SD* = 4.32) while measuring mothers' resting baseline HRV via respiratory sinus arrhythmia. Results indicated that the association between *Leary Interaction Anxiousness Scale* scores and overprotective parenting was moderated by HRV, where only under conditions of low HRV was there an association between maternal shyness-anxiety and overprotective parenting.

In summary, some parenting behaviors have established links with generalized anxiety disorder symptoms, social anxiety, interaction anxiousness, and neuroticism while other parenting behaviors have not. Identifying the specific types of parenting behaviors that are linked to various types of parent anxiety will aid in understanding associations between anxiety and parenting. Poor emotion regulation may exacerbate the link between different facets of anxiety and poor parenting. These ideas are expanded upon in the following section.

CHAPTER 3. ANXIETY AND EMOTION REGULATION

Anxiety - Overview and Definition

In many theories of personality, anxiety is a concept that is central to explaining problematic psychological and psychosomatic symptoms (Spielberger, 1966). Freud attempted to elucidate anxiety in a clinical setting by defining it as an affective condition characterized by mental states such as nervousness, apprehension or dread, and/or an unpleasantness coupled with physiological markers of heart palpitations, disrupted breathing, excessive sweating, vertigo, and tremors (Freud, 1924).

The current understanding of anxiety is that it is multifaceted and takes on many forms (Barlow, 2002). This understanding has been developed by measurements based upon observation, surveys, interviews, controlled laboratory experiments, and physiological measures. For example, the anxiety disorders listed in the DSM-V are general anxiety disorder, social anxiety disorder, panic disorder, agoraphobia, specific phobias, and health anxiety (hypochondria). Additionally, obsessive-compulsive disorder and post-traumatic stress disorder are characterized by their anxiety symptoms. For instance, generalized anxiety disorder symptoms are characterized by excessive worry, difficulty controlling feelings of worry, restlessness, fatigue, difficulty concentrating, and significant distress or impairment in social and/or occupational domains or other significant areas of functioning (5^{th} ed.; DSM-5; American Psychiatric Association, 2013). Physiologic symptoms of anxiety include dizziness, nausea, sweating, heart palpitations, chest pain, and breathlessness (McTeague & Lang, 2012). Trait anxiety, current anxiety, and current somatization are the focus of this research study.

First, trait-anxiety refers to individual differences in the tendency to experience anxiety symptoms as a personality trait; it captures how an individual generally experiences emotions such as fears and worries (Spielberger, 1970). Trait anxiety is often assessed with the State-Trait Anxiety Inventory (STAI) – trait version (Spielberger, Gorush, & Lushene, 1970). Individuals who are high in trait-anxiety (e.g. neurotic) are more at risk to experiencing anxiety states than are non-anxious (i.e. low trait-anxiety) individuals. These anxiety states are characterized by repeated expressed concerns about body symptoms and stable perceptions of environmental stimuli as being threatening. Body symptoms from this measure include physiological hyperarousal, such as a racing heart and sweating. Trait anxiety is associated with over-attention to threatening stimuli at a perceptual level and a negative interpretation of information that fosters anxious responses on the cognitive level. Additionally, at the cognitive level, there is over-recall of threatening information (Gidron, 2013).

Second is current anxiety symptoms or an individual's recent feeling of anxiety. To assess this, the Brief Symptom Inventory 18 (BSI 18; Derogatis, 2001) measures symptoms of anxiety experienced in the past two weeks. Anxiety on the BSI 18 is conceptualized through currently experiencing symptoms of restlessness (such as inability to sit still due to restlessness), nervousness (nervousness or shakiness inside), and tension (feeling tense or keyed up) with items is comprised of questions such as "suddenly scared for no reason," "spells of terror or panic," and "feeling fearful."

Finally, somatization is defined as psychological distress common in anxiety that arises when an individual perceives bodily dysfunction (examples include a racing heart or heart palpitations, gastrointestinal issues, and changes in respiration) that are otherwise unexplained by known medical findings. Symptoms of somatization can be helpful in identifying psychological conditions of affective disorders, notably anxiety. Psychological distress is central to somatization as it arises from experiencing symptoms of bodily dysfunction which cannot be effectively communicated or understood. This is often seen in children who do not yet have the cognitive or verbal skills to communicate their symptoms (Dufton, Dunn, & Compas, 2009; Garralda, 2000). Somatization has also been linked to both parenting behaviors and emotion regulation. In parenting, Newland et al. (2013) found somatization (as measured by the BSI 18) was related to decreased sensitive and supportive parenting behaviors. As a function of emotion regulation, individuals who experienced somatic symptoms displayed lower variability in HRV to a painful stress task (Pollatos et al., 2011).

The present study asks how these forms of anxiety relate to parenting assessed by various positive and negative parenting behaviors on the APQ. Theoretically, anxiety symptoms, as they are measured by these different scales, will capture a broader spectrum of symptoms that manifest as anxiety. Including measures of trait-anxiety will give insight to how an individual generally experiences anxiety as a fundamental personality characteristic, while measures of current symptoms of anxiety via the BSI 18 can assess if and how an individual experiences recent anxiety symptoms. In theory, trait anxiety may have a stronger link to parenting behaviors as it is more pervasive, whereas current anxiety may be situational and less impact parenting; however, both forms of anxiety may have effects on parenting behaviors.

Emotion Regulation

Self-reported emotion regulation.

At the core of human behavior, emotion drives motivation, aids social interaction, and helps consolidate meaningful moments into memories. Emotions play a key role in the basis of complex behavioral choices by facilitating decision making between the individual and important challenges or opportunities (Levenson, 1999; Tooby & Cosmides, 1990). Working definitions identify emotion as the inner determinant of behavior, evoked by mental events and provoking changes in the domains of subjective experience, neurological systems, and physiological systems in response to environmental demands (Frijda, 1986). The ability to upregulate or downregulate emotions in appropriate contexts is referred to as emotion regulation. Eisenberg defines emotion regulation as “the process of initiating, avoiding, inhibiting, maintaining, or modulating the occurrence, form, intensity, or duration of internal feeling states, emotion-related physiological, attentional processes, motivational states, and/or the behavioral concomitants of emotion in the service of accomplishing affect-related biological or social adaptation or achieving individual goals” (Eisenberg, 2006). Emotion regulation meets challenges when an individual is unable to adapt their emotions to the environmental need. Typically, this emotion dysregulation can be observed in individuals who experience anxiety disorders, depressive disorders, and obsessive compulsive and related disorders.

Emotion regulation has been assessed by self-report through assessments of an individual’s ability to understand, accept, and control emotions (Gratz & Roemer, 2004; Gross & Levenson, 1993). Self-report measures, such as assessed with the *Difficulty in Emotion Regulation Scale* (DERS) (Gratz & Roemer, 2004), measures aspects of subjective emotion ability and emotion regulation strategies. The DERS, a 41-item questionnaire, evaluates an individual’s awareness and understanding of their emotions, acceptance of their emotions, ability to either engage in goal-directed behavior or refrain from impulsive behaviors, and access to perceived effective emotion regulation strategies. Example items from the DERS are: “When I’m upset, I lose control over my behaviors” and “When I’m upset, it takes me a long time to feel better.” Previously, the DERS has been used with measures of heart rate variability to find an association between self-reported difficulties in emotion regulation and decreased heart rate variability (Berna, Ott, & Nandrino, 2014).

Heart rate variability

When the affective system successfully regulates emotions- that is, there is necessary accentuation or dampening of emotionally salient situations, the individual is able to adapt quickly to challenges and experiences the ability to respond flexibly in order to meet those situational demands. This ability to respond flexibly is thought to be a function of changes in sympathetic and parasympathetic nervous system activity, marked by increases in heart rate through inhalation and decreases in heart rate through exhalation. Mechanistically, fluctuations in heart rate support mobilization or inhibition of behaviors by regulating the amount of oxygenated blood to muscles and internal organs. This process aids an individual in their ability to respond appropriately (e.g. via fight-or-flight) when faced with a stressful or emotionally salient situation (Porges, 2007). Alongside self-report instruments for emotion regulation abilities, laboratory assessments exist to capture an individual's ability to regulate emotions through physiologic measures. Namely, this is done through capturing tonic (baseline) and phasic (changes in) heart rate variability.

Previous research has identified resting heart rate variability and vagal regulation as biomarkers of emotion regulation (Appelhans & Luecken, 2006; Beauchaine, 2001; Porges, 2007; Thayer & Lane, 2000). As described in Porges' Polyvagal Theory (2007), heart rate variability (HRV) is an index of emotion regulation that is calculated through variability of inter-beat intervals of the heart and provides insight to an individual's tonic and phasic levels of heart rate variability within their environment.

Tonic levels of heart rate variability are a marker for "flexible dynamic regulation of autonomic activity... higher [tonic] HRV signals the availability of context- and goal-based control of emotions" (Thayer et al., 2012). More heart rate variability has been associated with better emotional and health regulation, social functioning, and is seen as an adaptive function (Grossman and Taylor, 2007; Porges, 2007; Thayer et al., 2009; Williams et al., 2015). A series of studies by Thayer and colleagues (2012) have found that individuals with higher tonic HRV, compared to those with lower tonic HRV, were able to produce context appropriate emotional responses. Additionally, Fabes and Eisenberg (1997) found higher tonic HRV (measured as respiratory sinus arrhythmia) in adults predicted greater self-regulatory control as well as decreased negative affective arousal in the presence of moderate-to-high level stressors.

Conversely, lower tonic HRV has been documented in adults with anxiety disorders (Friedman & Thayer, 1998; Thayer, Friedman, & Borkovec, 1996) and is associated with anxiety in youth (Scott & Weems, 2014). Individuals who show difficulty in regulating emotions (e.g. demonstrated through a failure to inhibit a fear or anger response in the appropriate social contexts) exhibit differences in baseline autonomic nervous system (ANS) activity and ANS reactivity (see review by Balzarotti, Biassoni, Colombo, and Ciceri, 2017). A review by Chalmers, Quintana, Abbott, and Kemp (2014) compiled studies that found an association between lower resting HRV in individuals with panic disorder, post-traumatic stress disorder, generalized anxiety disorder, and social anxiety disorder compared to healthy controls. In this review, effect sizes were generally small-to-moderate. Individuals with lower tonic HRV have displayed delayed recovery from psychological stressors compared to those with higher tonic HRV (Weber et al, 2010). A study by Williams et al. (2015) found that difficulties in self-reported emotion regulation (specifically, lack of emotional clarity and impulse control measured by DERS) were associated with low tonic HRV. Low tonic HRV may indeed be a risk factor for psychopathology (Thayer and Lane, 2009) and specifically, in the interest of this study, anxiety.

Phasic HRV, or HRV reactivity, captures the change in HRV as an individual regulates their emotions during emotion regulation tasks. Increases in phasic HRV have been shown to reflect effective emotion regulation responses (Thayer et al., 2012), where decreases in phasic HRV have been suggested to occur as an individual redirects resources from performance in goal-directed tasks to processing potential threats or stressors within the environment (Park et al., 2014). Decreases in phasic HRV are known to occur as an autonomic response to stress, which characterizes activation of the defensive system and withdrawal of cardiac HRV (Thayer, Friedman, & Borkovec, 1996).

What implications does the relationship between anxiety and HRV have on parenting? It is possible that parenting behaviors are influenced by levels of anxiety, which may in turn be indexed by lower levels of tonic HRV and greater vagal withdrawal through decreases in phasic HRV. Previous studies have found a relationship between HRV and parenting behaviors and are reviewed in the following section. Understanding the link between tonic HRV, phasic HRV, and emotion regulation in parents may guide our understanding in the occurrence of certain parenting behaviors.

Emotion Regulation and Parenting

Emotions reflect feelings of parents' own parenting competencies and guide parent behaviors and parenting styles (Okagaki and Luster, 1993). Emotions, emotional feedback, and emotion regulation are central to relationships within the family and between parent-child dyads. For example, when faced with an emotionally challenging situation, some parents are more able to organize and orient their behaviors to appropriately respond. Alongside parents' psychological well-being, emotion regulation may be important to parenting behaviors. Previous research has shown that parental behaviors may be influenced by different physiological resting states and reactivity. Perlman, Camras, and Pelphrey (2008) found that parents' heart rate variability was related to socialization behaviors, which in turn influenced the emotional development of their children. In abusive mothers, lower HRV was been associated with strict, hostile control behaviors while in non-abusive mothers, higher HRV predicted more positive, consistent parenting behaviors (Skowron et al., 2013). Notably, a study by Crouch et al. (2018) found that parents who had difficulty regulating autonomic reactivity during an anagram-solving task were at higher risk for child physical abuse. Self-reported emotion regulation difficulties have also been linked to parenting. A study by Mazursky-Horowitz et al. (2014) found that difficulties in emotion regulation (as measured by the DERS) mediated the relationship between maternal ADHD and harsh parenting and was also negatively associated with positive parenting. A similar study by Carreras et al. (2019) found that difficulties in emotion regulations (DERS) mediated the relationship between parents' psychological distress and decreased sensitive parenting behaviors.

Given the link between anxiety disorders and emotion regulation, it is important to consider the role of emotion regulation as it relates to anxious parents' behaviors. In the context of parents' involvement, positive parenting, supervision and monitoring, consistency of discipline, and corporal punishment, few studies have observed the role of emotion regulation as indexed by self-reported emotion regulation difficulties. While prior studies have looked to emotion regulation as a mediator of parents' well-being and parenting behaviors (Morelen, Schaffer, & Suveg, 2016; Zhang et al., 2020) there is a lack of studies observing *moderating* effects of self-reported emotion dysregulation on parenting behaviors. Furthermore, few studies have theorized a model of parenting with moderating effects of heart rate variability. Parents with anxiety may differ in their tonic and phasic vagal regulation to stress compared to parents without anxiety symptoms, and these differences may strengthen or buffer the relationship between anxious affect and parenting behaviors.

Overall, emotion regulation is important for appropriately responding to stressful situations. As such, emotion regulation might be important in the context of parenting and may serve a function in the expression of parenting behaviors.

CHAPTER 4. THE CURRENT STUDY

The purpose of this study is to test a theoretical model (presented in Figure 1) linking parent's anxiety and parenting behaviors and to determine if the relationship is moderated by parent's ability to regulate emotions. This study examines a) the relationship between facets of anxiety in parents of youth and parenting behaviors and b) the moderating effects of self-reported and physiologic emotion regulation on associations between parents' general anxiety symptoms and parenting behaviors. The model predicts that certain parenting behaviors may be dependent on the parent's ability to upregulate or downregulate their anxious emotions. Based on previously discussed literature, the hypothesis is that parents with anxiety symptoms and inadequate emotion regulation skills will exhibit suboptimal parenting strategies, while in comparison, parents with anxiety symptoms but greater ability to regulate emotions will exhibit more optimal parenting strategies. Polyvagal Theory (Porges, 2007, 2011) postulates that resting heart rate variability and vagal response to stress are associated with emotional and behavioral response. Additionally, the Neurovisceral Integration Model by Thayer and Lane (2000) proposes faulty vagal inhibition on sympathetic activation in anxiety disorders- in other words, an inability to inhibit inappropriate responses. Drawing on Porges' Polyvagal Theory and Thayer and Lane's Neurovisceral Integration Model, this model suggests poor emotion regulation as indexed by low tonic HRV and decreases in phasic HRV will moderate the relationship between parents' anxiety and parenting behaviors. While links between certain parent anxiety and parent behaviors exist, emotion regulation may serve as a buffer between anxiety and behavior. Hypothetically, we may expect parents who report greater anxiety symptoms to exhibit poor parenting practices (i.e. poor supervision and use of corporal punishment) and that these behaviors occur in the presence of lower tonic HF-HRV and greater decreases in phasic HF-

HRV. Given that not all individuals with anxiety disorders or symptoms display reductions in resting or reactive HRV, it is possible that emotion regulation may be a system that differentially influences behaviors in the presence of anxiety disorders. As theorized by Cisler et al. (2010), anxiety and emotion regulation are separate, non-redundant constructs where 1) both can be differentiated behaviorally, conceptually, and neurologically; 2) emotion regulation may diminish fear; and 3) emotion regulation may explain variability in anxiety symptoms above and beyond variability captured by other measures of emotional reactivity.

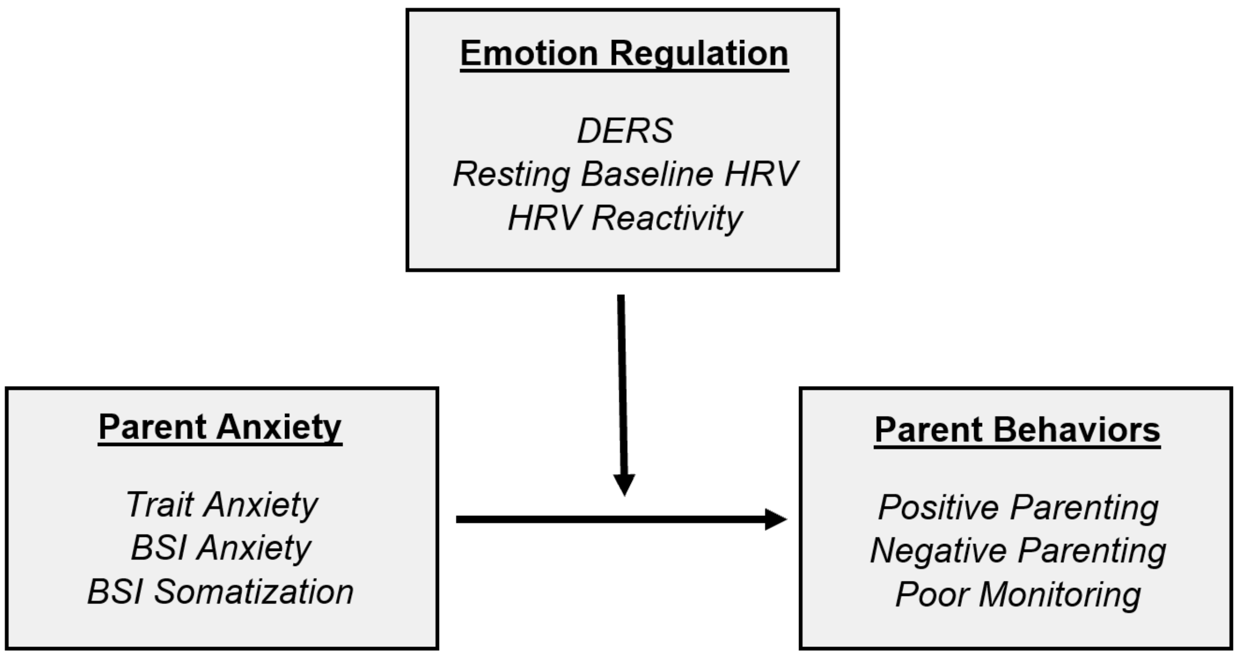

Figure 1. Moderation Model of Emotion Regulation on Link between Parent Anxiety and Parenting Behavior

CHAPTER 5. METHODS

Participants

Data analyses were collected by the Youth and Family Anxiety, Stress, and Phobia Lab of the University of New Orleans (UNO) from August, 2011 to March, 2013. The present study focused on the responses of the caregivers, therefore responses from children were excluded.

In this data set, eighty caregivers were recruited. Six caregivers in the sample were missing physiological data. Behavioral analyses were conducted on responses from all caregivers, while physiologic analyses were conducted on 74 of the caregivers with available data. Caregivers were asked to provide personal information, including age, gender, ethnicity, and family income. Mean age of the sample was 40.68 with ages ranging from 29 to 58. Caregivers reported ethnicities as 36.2% African American (n = 29), 47.5% Euro-American (n = 38), 7.5% other/mixed ethnic background (n = 6) and 7.5% Hispanic (n = 7). The median family income (n_{family} = 80) was between $20,000 and $49,999 a year. Mothers comprised 92.5% (n = 74) of the sample with the remaining 7.5% (n = 6) fathers. Thirty-nine percent of caregivers reported currently being married. When asked if caregivers had ever been divorced, 70% reported “no”, 25% reported “yes”, and 5% of respondents had missing data.

Measures

Anxiety.

The State-Trait Anxiety Inventory (STAI), a commonly used measure of anxiety developed by Spielberger, Gorush, and Lushene (1970) was administered to assess self-report levels of trait anxiety (anxiety as a personality characteristic) with questions assessing “how you generally feel?” Assessments are measured on a 4-point Likert scale and responses for trait anxiety questions range from “almost never” to “almost always.” Example questions include “I feel nervous and restless" and questions coded reversely, such as "I make decisions easily." Upon initial development of the scale, test-retest reliability coefficients ranged from .31 to .86. For the current study, the Cronbach's alpha for the STAI trait subscale indicated excellent reliability with a value of .91. Assessment of state anxiety was not included in this study.

As noted, the Brief Symptom Inventory 18 (BSI 18) was administered to evaluate current anxiety and somatization. The BSI 18 is derived of items from the Symptom Checklist 90-Revised, a scale designed to assess aspects of current psychological health that is often used in psychological and psychiatric research studies. Scoring is based upon a 5-point scale of distress, ranging from "not at all" (0) to "extremely" (4). Respondents are instructed to answer each item by reflecting on the "past week including today." For this study, two subscales of the BSI 18 were used: anxiety (BSI anxiety) and somatization (BSI somatization). Example items of these subscales include ranking "feeling fearful" and "nervousness or shakiness inside." Reliability analyses indicated a Cronbach's alpha of .73 for BSI anxiety and .61 for BSI somatization.

Parenting behaviors.

The Alabama Parenting Questionnaire (APQ), developed by Frick (1991) is a 42-item self-report scale designed to measure how parents interact with their children. The APQ consists of items that are divided into 5 subscales: involvement ("You play games or do other fun things with your child"), positive parenting ("You let your child know when he/she is doing a good job with something"), poor monitoring/supervision ("Your child is at home without adult supervision"), inconsistent discipline ("The punishment you give your child depends on your mood"), and corporal punishment ("You hit your child with a belt, switch, or other object when he/she has done something wrong"). Directions instruct the parent 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*. In line with previous research using the APQ (Woods et al., 2019) and to accommodate a relatively small sample size, parent behaviors were standardized and entered into a series of principal components analyses (PCA), creating subscales of Positive Parenting (α = .85), Negative Parenting (α = .72), and Poor Monitoring (α = .72) (Hinshaw et al., 2000). For the current study, Cronbach's alpha for each subscale of the PCA for the APQ were $\alpha > .75$.

Indices of emotion regulation.

Self-reported emotion regulation.

The *Difficulty in Emotion Regulation Scale* (DERS) (Gratz & Roemer, 2004) is a 41-item self-report questionnaire that measures an individual's awareness and understanding of their emotions, acceptance of their emotions, ability to either engage in goal-directed behavior or refrain from impulsive behaviors, and access to perceived effective emotion regulation strategies. Participants are instructed to indicate how often the item applies to themselves by responding on a scale of 1 to 5, where 1 = *almost never*, 2 = *sometimes,* 3 = *about half the time*, 4 = *most of the time*, and 5 = *almost always*. For this study, the DERS have been recoded so that higher scores for each item indicated greater difficulty in emotion regulation. The DERS has high internal consistency of Cronbach's α = .93, good test-retest reliability, and adequate predictive validity. Example items include "When I'm upset, I feel guilty for feeling that way," "When I'm upset, I feel like I am weak," "When I'm upset, I lose control over my behaviors," and "I have no idea how I am feeling."

Emotion regulation physiology.

The physiological indices of emotion regulation were derived from this data and includes 1. resting and 2. reactive heart rate variability (Porges, 2007, 2011). Resting HRV and HRV reactivity consists of *High Frequency – Heart Rate Variability (HF-HRV),* which is currently understood to represent involuntary parasympathetic-mediated heart rate regulation. Drawing from previous studies (Appelhans & Luecken, 2006; Berntson et al., 1997; Vasilev et al., 2009), HRV was analyzed using normal, artifact-free inter-beat intervals obtained from the EKG signal. The collection and extraction of HF-HRV for resting baseline and reactivity is explained in more detail in the Procedures section.

Procedure

The UNO IRB reviewed the study and granted approval. Recruitment procedures involved recruiting parents of youth by distributing flyers in local middle and high schools, as well as recruiting undergraduate students enrolled in University of New Orleans psychology courses to refer parents and their children, and posting advertisements via social media and online platforms (i.e., Facebook and Craigslist). The flyers and advertisements specifically asked for help from parents and their children in conducting a project on the emotional reactivity of the parent-caregiver dyads (see Scott & Weems, 2014), though only parent data were analyzed for the current study. As compensation, families received a small amount of cash for their participation.

Participants initiated contact to the research lab by calling the phone number printed on an advertisement for the study. A member of the research lab provided the participant with an overview of the study and gathered further contact information (e.g., name, phone number, etc.) and were screened for eligibility. For those still interested and eligible, the lab member scheduled an appointment based upon the participants' availability. Each participant was instructed not to eat, drink anything but water, or smoke cigarettes one hour before the scheduled appointment.

Upon arrival, a trained graduate assistant (GA) detailed the purpose of the research study and obtained signed written informed consent forms, as well as gave the opportunity to ask further questions, before proceeding. Once informed consent was obtained, the participant was escorted to the control room by both the GA and a trained research assistant (RA). The GA explained that the participant would be sitting in this room during the physiological assessment period and would be provided instructions through speakers via a microphone used by the GA in a separate room.

Physiological measurements of heart rate and respiration were collected and stored on a Dell Studio XPS, Intel ® Core™, 2.67GHz, 3GB RAM. Electrocardiogram (EKG) data were collected with the Biograph Infiniti software and its accompanying hardware component (ProComp Infiniti Encoder; Meyers, 2010), then later cleaned and analyzed with Kubios HRV 2.1 software (Tarvainen, Niskanen, Lipponen, Ranta-aho, & Karjalainen, 2009). The Biograph Infiniti software was run using a Microsoft Windows 7, 32-bit operating system. Data output was stored within a designated file on the computer, identified by the participants' ID number. Sensors connected to the ProComp Infiniti encoder were attached to participants via fiber optic wiring. Signals were transmitted to the computer. Three electrocardiogram sensors were attached using pre-gelled UniGel electrodes and were placed on the right abdomen (1) and left abdomen (1) below the rib cage, and one sensor was placed at the top of the sternum.

Tonic heart rate variability.

In order to capture tonic heart rate variability, or resting HRV, the participant first needed to become acclimated to the testing environment. To acclimate the participant to the environment, he or she was instructed to relax and watch a 5-minute video (*Coral Sea Dreaming Film Clip*) displaying undersea fish and coral reef, which was extrapolated from *Coral Sea Dreaming*. This method of producing relaxed and stable physiological states has been well documented as a reliable and valid method in young adults (Piferi, Kline, Younger, & Lawler, 2000). If issues arose with the EKG signal during this phase, the research assistant readjusted sensor placement immediately following this task. To capture tonic heart rate variability, after the video clip task, the experimenter instructed the participant to relax and breathe normally for five minutes while physiological data was recorded.

Phasic heart rate variability.

To capture physiologic stress reactivity, or phasic heart rate variability, participants were instructed to participate in a nonverbal arithmetic task (Mental Arithmetic Task; Stroud et al., 2009). This task consisted of the participant being asked to subtract a specific number from 500, followed by subtraction of that number from each subsequent answer. Participants were asked to type their answers on a keypad placed on the desk in front of them. The purpose of the nonverbal task was to minimize fluctuations in EKG signals that occur as a result of speaking, which may affect the HF-HRV index. The entire task lasted for exactly three minutes and five seconds. Data from the first three minutes were extracted and analyzed.

To calculate phasic heart rate variability, individual regression slopes were extracted between the resting baseline task and the math task using regression coefficient analysis (Lorch & Myers, 1990). Calculating regression coefficients differs from values derived from change scores in that regression coefficients are estimated per individual participant, where different observations are not independent from each other. Regression coefficient analysis offers more flexible alternatives to ANOVA approaches typically used in within-participant designs (Pfister, Schwarz, Carson, & Jancyzk, 2013). Using individual regression slopes for each participant as their change in (phasic) HRV avoids the problems inherent in using difference scores or residual analyses. The dependent variable (HRV) is regressed on the independent variable (time) for each participant, then the extracted values for slopes are compared between conditions or against a population value of zero (Pfister, Schwarz, Carson, & Jancyzk, 2013). Positive slopes represent an increase from resting baseline to the math task, or an increase in HRV reactivity, while negative slopes represent a decrease or vagal withdrawal.

Physiological data extraction.

First, the data were both manually and visually inspected for artifacts (e.g., misidentified r peaks, missed, or extra heart beats). Next, at medium-correction setting, inter-beat intervals that were .25 seconds above or below the mean for the time series were detected using an automatic artifact detection algorithm. If agreement existed between the automatic detection and the manual detection, automatic corrections of inter-beat intervals artifacts were allowed and manual correction was used for any discrepancies. To remove non-stationary data, the artifact-free inter-beat intervals were then resampled and the epoch detrended using a second-order polynomial (Porges, Doussard-Roosevelt, & Maiti, 1994). Lastly, a Fast Fourier Transform algorithm was used to conduct a power spectral analysis on the resting baseline and mental arithmetic conditions, which produced variability distributions for low frequency HRV (LF; .04 to .15 Hz) and high frequency HRV (HF; .15 to .40 Hz). This method is consistent with reported standards for spectral analysis (Task Force of the European Society of Cardiology and the North American Society of Pacing and Electrophysiology, 1996).

In a separate nearby room, the GA began running a scripted physiological procedure using the Biograph Infiniti software to check for poor connections and other artifacts before proceeding. Any issues with the sensors or feedback were corrected by the GA by physically adjusting the electrodes.

Upon completion of the protocol, participants were provided with a debriefing form and asked if they had questions or concerns. The GA then thanked for their time and provided monetary compensation for their participation.

Data Analytic Strategy

In order to test the linear associations between heart rate variability during the baseline task and self-reported emotion regulation, parents' anxiety, and parenting behaviors, bivariate correlations were calculated. Descriptive statistics and frequency distributions were run to determine the presence of outliers and if the criteria for parametric analyses were met. To test for moderating effects of emotion regulation, a hierarchical multiple regression analysis was performed to test whether there was an interaction effect between parents' anxiety symptoms and parents' self-report and non-self-report emotion regulation. Moderation analyses were conducted using Hayes' PROCESS model, version 3.4 in SPSS (Hayes, 2013). PROCESS automatically centers all continuous variables to be performed before creating interaction terms. To determine statistical significance of models, 95% confidence intervals around beta coefficients, as well as *p* values of less than .05 for interaction terms, were used to detect if the overall moderation analysis was significant. Conditional effects of the moderator were then examined with the simple slopes at one standard deviation below the mean, equal to the mean, and one standard deviation above the mean, and significant interactions were subsequently plotted.

CHAPTER 6. RESULTS

Preliminary Data Analyses

Descriptive statistics and scatter plots indicated that the following variables had a non-normal distribution. The distribution for phasic HF-HRV was slightly skewed, with outliers (n = 2) that were greater than two standard deviations below the mean. The distribution of anxiety and somatization scores as measured by the BSI-18 showed high kurtosis and indicated variables held values two standard deviations above the mean (n = 4, n = 4, n = 5). The APQ-Hinshaw Poor Monitoring scale was slightly skewed. To handle outliers, data were transformed using the winsorization method. Winsorizing entails limiting values below the 5th percentile and above the 95th percentile to be within the standard range. This method holds advantages over retaining or truncating the outlier data by introducing less bias and by reducing the elimination of data points in relatively small samples. For missing data, pairwise deletion of cases was used given that separate analyses were run using different variables. The means, standard deviation, range, skewness, and kurtosis values after transformation of outliers are summarized in Table 2. To examine the relationship across the study variables, Pearson's correlations were conducted and are summarized in Table 3. Trait anxiety was significantly positively associated with BSI Anxiety (r = .56), BSI Somatization (r = .43), difficulties in emotion regulation (r = .67), and negative parenting (.28) and negatively associated with positive parenting (r = -.22). BSI anxiety was significantly positively associated with BSI somatization (r = .32), difficulties in emotion regulation (r = .50), and negative parenting (r = .24). BSI somatization was positively associated with difficulties in emotion regulation (r = .29). Tonic HF-HRV was significantly negatively associated with phasic HF-HRV (r = -.32) and negative parenting (r = -.24), while phasic HRV was significantly positively related to difficulties in emotion regulation (r = .27). Difficulties in emotion regulation were significantly positively associated with negative parenting ($r = .36$), negatively associated with positive parenting ($r = -.26$), and positively associated with poor monitoring ($r = .31$).

Hypothesis: Ability to regulate emotions moderates the relationship between parental anxiety and parenting practices.

This hypothesis states that emotion regulation as indexed by both self-report, using the Difficulties in Emotion Regulation Scale, and non-self-report, using tonic HF-HRV and phasic HF-HRV, will moderate the relationship between parent anxiety and behavior, such that a) anxiety will predict parenting behaviors and relationships will be strengthened or weakened by varying degrees of emotion regulation. Conversely, poor emotion regulation is hypothesized to b) strengthen the relationship between parent anxiety and parenting behaviors, where greater anxiety predicts suboptimal parenting practices under the influence of poor emotion regulation. Separate moderation models were run for each predictor, moderator, and outcome and regressions are summarized in Tables 4a-6c. Plots for visualizing the conditional effects of the predictors were performed. Simple slopes were evaluated at plus and minus one standard deviation and at the mean of each measure of emotion regulation.

Emotion regulation as indexed by resting HF-HRV

To examine if levels of tonic HF-HRV moderated the association between parent’s anxiety and parenting behaviors, parent’s anxiety, tonic HF-HRV, and a centered interaction term were entered to predict positive parenting, negative parenting, and poor supervision. Predictors were centered via subtracting the mean of the original variable and were entered simultaneously into the regression. The full regression models are reported in Tables 4a-4c.

Results indicated no effect of tonic HF-HRV (p > 0.05) on trait anxiety [Model R^2 = 0.06, F (3, 69) = 1.38, p = 0.26] and BSI somatization [Model R^2 = 0.02, F (3, 69) = 0.43, p = 0.73] in predicting positive parenting (Table 4a). Results indicated a trending effect of tonic HF-HRV (p = 0.09) on BSI anxiety, however, the overall model was nonsignificant [Model R^2 = 0.05, F (3, 69) = 1.21, p = 0.31]. Results also indicated no significant moderating effect (p > 0.05) of tonic HF-HRV on trait anxiety [Model R^2 = 0.13, F (3, 69) = 3.38, p < 0.05], BSI anxiety [Model R^2 = 0.16, F (3, 69) = 4.41, p < 0.01] or BSI somatization [Model R^2 = 0.08, F (3, 69) = 02.08, p = 0.11] in predicting negative parenting practices (Table 4b). Results indicated no effect of tonic HF-HRV on trait anxiety [Model R^2 = 0.07, F (3, 69) = 1.61, p = 0.20], BSI anxiety [Model R^2 = 0.03, F (3, 69) = 0.82, p = 0.49], or BSI somatization [Model R^2 = 0.09, F (3, 69) = 2.06, p = 0.12] in predicting poor monitoring (Table 4c).

Emotion regulation as indexed by HF-HRV reactivity

To examine if levels of phasic HF-HRV moderated the association between parent’s anxiety and parenting behaviors, parent’s anxiety, phasic HF-HRV, and a centered interaction term were entered to predict positive parenting, negative parenting, and poor monitoring. The full regression models are reported in Tables 5a-5c.

In predicting negative parenting, the interaction term of trait anxiety and phasic HF-HRV was significant [Model R^2 = 0.16, F (3, 69) = 4.41, p < 0.01] (Table 5a) and the nature of the interaction is depicted in Figure 2. Post-hoc testing indicated the association between trait anxiety and negative parenting is positive and steep when phasic HF-HRV decreased (-1 SD; β = 0.49, p < 0.001), as well as positive for individuals who showed levels of phasic HF-HRV around the mean (0 SD; β = 0.24, p < .05). Additionally, when predicting poor monitoring, the interaction term of trait anxiety and phasic HF-HRV was significant [Model R^2 = 0.15, F (3, 67)

= 3.80, p < 0.001] (Table 5c) and the nature of the interaction is depicted in Figure 3. Post-hoc testing indicated the association between trait anxiety and phasic HF-HRV when predicting poor monitoring is significant, positive, and steep when phasic HF-HRV is decreased (-1 SD; β = 0.45, p < .001). Lastly, when predicting poor monitoring, there was a significant interaction term of somatization and phasic HF-HRV on poor monitoring [Model $R^2 = 0.11$, $F(3, 67) = 2.66$, $p < 0.05$] (Table 5c). Post-hoc testing indicated that greater somatization positively and steeply predicted poor monitoring when phasic HF-HRV is decreased (-1 SD; β = 0.68, p < .05) and is depicted in Figure 4.

A significant moderation effect ($p < 0.01$) revealed that decreased stress reactivity as indicated by phasic HF-HRV moderated the association between greater somatization and decreases in positive parenting behaviors; however, the overall model was trending toward significance [Model $R^2 = 0.10$, $F(3, 69) = 2.61$, $p = 0.06$] (Table 5b).

For positive parenting, there was no effect of phasic HF-HRV ($p > 0.05$) on trait anxiety [Model $R^2 = 0.07$, $F(3, 69) = 1.65$, $p = 0.19$] or BSI anxiety [Model $R^2 = 0.01$, $F(3, 69) = 0.31$, $p = 0.82$] (Table 5b). There were no significant nor trending moderating effects of phasic HF-HRV on BSI anxiety [Model $R^2 = 0.08$, $F(3, 69) = 1.95$, $p = 0.13$] or BSI somatization [Model $R^2 = 0.07$, $F(3, 69) = 1.77$, $p = 0.16$] in predicting negative parenting (Table 5a).

Emotion regulation self-report

To examine if levels of self-reported emotion regulation as measured by the DERS moderated the association between parent's anxiety and parenting behaviors, parent's anxiety, self-reported emotion regulation, and a centered interaction term were entered to predict positive parenting, negative parenting, and poor supervision. The full regression models are reported in Tables 6a-6c.

Results indicated a trending moderation effect of overall difficulties in emotion regulation (DERS total) ($p = 0.06$) in parent trait anxiety predicting positive parenting behaviors [Model $R^2 = 0.11$, F (3, 75) = 3.19, $p < 0.05$] (Table 6a). Conditional effects trended toward parents' self-reported greater ability to regulate emotions predicting positive parenting in parents with greater levels of trait anxiety.

Results indicated no significant nor trending moderation effect of the total DERS score ($p > 0.05$) on BSI anxiety [Model $R^2 = 0.16$, F (3, 75) = 4.64, $p < 0.01$] or BSI somatization [Model $R^2 = 0.07$, F (3, 75) = 2.02, $p = 0.12$] in predicting positive parenting (Table 6a).

Results indicated no significant nor trending moderating effect of the DERS total ($p > 0.05$) on trait anxiety [Model $R^2 = 0.5$, F (3, 75) = 4.53, $p < 0.01$], BSI anxiety [Model $R^2 = 0.14$, F (3, 75) = 3.95, $p < 0.01$], or BSI somatization [Model $R^2 = 0.14$, F (3, 75) = 4.20, $p < 0.01$] in predicting negative parenting practices (Table 6b).

Similarly, results indicated no significant or trending moderating effects of the DERS total on trait anxiety [Model $R^2 = 0.02$, F (3, 75) = 0.54, $p = 0.65$], BSI anxiety [Model $R^2 = 0.02$, F (3, 75) = 0.48, $p = 0.70$], or BSI somatization [Model $R^2 = 0.06$, F (3, 75) = 1.30, $p = 0.28$] in predicting poor monitoring (Table 6c).

CHAPTER 7. DISCUSSION AND CONCLUSION

Previous research has demonstrated that parents who experience anxiety may differ in their parenting styles. The present study makes contributions to knowledge about the role of parent's anxiety and parent's emotion regulation on parenting behaviors. The present study is the first to examine the influence of trait and current anxiety on positive and negative parenting behaviors as assessed by the APQ and how this relationship is moderated by self-reported and physiological indices of emotion regulation. Notably, the overall pattern was not overwhelmingly supportive of moderation, as only few of many tested models supported this hypothesis. However, some interesting leads emerged.

The first main finding was that greater levels of trait anxiety predicted greater levels of negative parenting (e.g. inconsistent discipline, corporal punishment), moderated by low phasic HRV during a stress task (Figure 2). Low physiologic reactivity to a stressor has been implicated as a marker of emotion dysregulation- often, individuals who experience chronic stressors or inabilities to effectively cope with stressors are unable to flexibly adapt to environmental demands (Appelhans & Luecken, 2006). Previous studies have suggested a role of low physiologic reactivity/phasic HRV in harsh parenting (Crouch et al., 2018; Disbrow, Doerr, & Caulfield, 1977; Pruitt & Erickson, 1985). Additionally, according to the chronic arousal hypothesis, abusive parents may display chronic states of heightened physiological arousal and limited variability in arousal in response to stressors (see Crouch et al., 2015). Consistent with the chronic arousal hypothesis, for parents who reported higher trait anxiety, the current study found low physiologic reactivity to a stressor predicted more instances of inconsistent discipline and corporal punishment. Theoretically, these forms of negative parenting may manifest through the inability to adapt to environmental demands.

The second main finding was that that high levels of trait anxiety predicted greater levels of poor monitoring, moderated by lower stress reactive HRV. Also found was that high levels of trait anxiety predicted lower levels of poor monitoring, moderated by higher stress reactive HRV. Interestingly, stress reactive HRV predicted both a strengthening and buffering effect for parents' trait anxiety on parental monitoring. As illustrated in Figure 3, as parents experience more trait anxiety, those who have lower reactivity to a stressor marked by HRV (a marker of emotion dysregulation) are less likely to monitor their children's activities and whereabouts. This may occur as a parent shifts attention away from their children and to their own anxiety and environmental triggers. Conversely, parents who experience more trait anxiety but have higher levels of stress reactive HRV tend to monitor their children more (Figure 3). Previous studies have found that anxious parents may be overprotective and engage in "helicopter" parenting (Cui et al., 2019; Lindhout et al., 2006), which may be a function of anxious parents expending more time, energy, and resources into their children. In the current study, it is unclear if low levels of poor parenting monitoring alone constitute helicopter parenting. Furthermore, how this is related to low stress reactive HRV is unclear, though we might speculate that helicopter parenting may be viewed as an effective "helping" strategy through the parent's perspective.

As an alternative interpretation, low levels of poor parenting monitoring in highly anxious parents may be a result of successful cognitive reappraisal. Noted by Cisler et al. (2010), better emotion regulation abilities can help diminish emotional responding. Indeed, cognitive reappraisal, which has been associated with higher HRV (Denson, Grisham, & Moulds, 2011), may aid parents in directing their attention from anxiety symptoms to effective, positive parenting.

The third main finding indicated that greater levels of somatization predicted greater levels of poor monitoring under the condition of low phasic HRV. Within the current study, somatization is assessed as the experience of bodily symptoms (most commonly pain, dizziness, and fatigue) that have no known underlying health condition. As stated previously, the chronic arousal hypothesis suggests that low variability in HRV reactivity may be a function of chronic arousal states. It is possible that as parents experience both chronic arousal and anxiety about their own bodily symptoms, they may shift their focus and attention away from their children and to their own internal states.

An interesting lead showed that parents who reported more anxiety about somatic symptoms exhibited less positive parenting behaviors only under the condition of low phasic HRV. Again, this may be explained in part by the chronic arousal hypothesis. Parents who experience more anxiety about their bodily symptoms may shift their focus away from positive parenting practices.

Furthermore, a second interesting lead showed that greater levels of trait anxiety predicted less positive parenting, moderated by more self-reported difficulties in emotion regulation. These results may suggest experiencing chronic anxiety symptoms, such as excessive worry, restlessness, and the inability to make decisions easily, negatively impact parenting in a significant way and may be exacerbated when the parent is knowingly unable to effectively regulate their emotions. Conversely, another interesting lead is that self-reported greater ability to regulate emotions predicted more positive parenting in the high trait anxiety parents. Greater ability to knowingly self-regulate emotions under influence of high trait anxiety may be a learned strategy to help with coping and, ultimately, lead to more positive parenting practices. The potential relationship between trait anxiety and positive parenting as moderated by self-reported emotion regulation should be investigated in future studies.

In addition to the main findings that supported the hypothesis, correlations between anxiety, emotion regulation, and parenting emerged. The present study found that trait anxiety was associated with both positive and negative parenting and BSI anxiety was associated with negative parenting (Table 3). These correlations are in line with previous research that establishes how different forms of anxiety are associated with parenting behaviors (Drake and Ginsburg, 2011; Ginsburg et al., 2004; Murray et al., 2012; van der Bruggen et al., 2010; Whaley, Pinto, & Sigman, 1999). As previously found, both trait and current anxiety may have an effect on parenting such that parents with anxiety display withdrawn or intrusive behaviors, less warm and supportive behaviors, and are less encouraging of autonomy (Drake and Ginsburg, 2011; Ginsburg et al., 2004; Murray et al., 2012; van der Bruggen et al., 2010; Whaley, Pinto, & Sigman, 1999). Interestingly, resting baseline HRV was negatively associated with negative parenting. Further examination shows that this relationship may be better represented as a cubic relationship (R^2 = .26) in place of a linear relationship (R^2 = .07) and requires further investigation.

Though relationships were found between trait/current anxiety and parentings behaviors, no direct association was found between somatization and parenting behaviors (Table 3). The lack of association between somatization and parenting was not consistent with Newland et al. (2013), where somatization was associated with decreased sensitive and supportive parenting; however, this difference may be accounted for by the use of two different measures of parenting behavior.

Correlations between emotion regulation and parenting within this study are also consistent with associations found in previous literature between emotion regulation abilities and parenting, where poor self-reported emotion regulation abilities predicted negative parenting practices (Morelen, Schaffer, & Suveg, 2016; Zhang et al., 2020) (Table 3). In particular, the current study finds an association between greater difficulty in self-reported emotion regulation skills and decreased positive parenting, more negative parenting behaviors, and poor monitoring. These findings are similar to those found within a sample of mothers clinically diagnosed with ADHD; a mediating effect of self-reported emotion regulation using the DERS was found between ADHD and both harsh parenting lower levels of positive parenting (Mazursky-Horowitz et al., 2014). The significant association between self-reported emotion regulation and decreased positive parenting are also consistent with a study by Carreras et al. (2019), where higher scores on the DERS mediated the relationship between parents' distress and decreased sensitive parenting.

Previous literature has reported that lower tonic HRV at rest and lower phasic HRV during a stress task predict strict, hostile parenting behaviors (Crouch et al., 2018; Skowron et al., 2013) and higher tonic HRV predicts more positive, consistent parenting behaviors (Skowron et al., 2013). In the current study, resting baseline HRV was negatively associated with negative parenting; interestingly, the relationship is quadratic in nature. No other significant correlations were found between tonic HRV nor phasic HRV on parenting behaviors in the current study (Table 3). One potential explanation for the differences in finding correlations may be that self-reported parenting behaviors vary from observational parenting behaviors, such that self-reported parenting behaviors ask about parenting behaviors in general, where parenting behaviors observed in a laboratory setting code for specific behaviors and cues that may not be captured through standard assessments of parenting behavior. Additionally, when it comes to caregiving, physiology and behavior may not be as apparent during a laboratory setting and may be context specific.

Limitations

Although this study contributes to the existing literature, several limitations must be taken into consideration. Most importantly, the current study is cross-sectional in nature, prohibiting any causal or directional inferences. Secondly, because the majority of the sample were mothers, determining whether parenting behaviors differ by gender was insufficient to perform statistically. Additionally, the small sample size did not allow for more complicated analyses, such as structural equation modeling with multiple covariates. Other limitations include that, while many models were run to determine whether emotion regulation had a moderating effect on the relationship between parent's anxiety and parent's behavior, only a few findings emerged.

Implications

The current study adds to the literature by providing evidence that anxiety, emotion regulation, and the interaction between anxiety and emotion regulation affect parenting behaviors. Indeed, while anxiety has been reported to have negative effects on parenting behaviors, this study provides preliminary evidence that anxiety alone does not influence parent's behaviors. Future studies on the relationship between anxiety and behaviors should look to potential moderating effects, such as self-reported and physiologic indices of emotion regulation. Furthermore, research suggests that children learn emotion regulation skills from parents through parenting behaviors and parents' own emotion regulation (Eisenberg, Cumberland, & Spinrad, 1998). Through social contact, there is synchrony of both parent-child social and psychological regulation, which facilitates further development of children's regulation (Graham, Scott, & Weems, 2017; Tronick, 1989). Critically, emotion dysregulation has been associated with maladaptive outcomes in youth, increasing the risk for developing internalizing and externalizing disorders (Weems et al., 2005; Yap, Allen, & Sheeber, 2007). Understanding the relationship between anxiety, emotion regulation, and parent behaviors may aid in preventing intergenerational transmission of poor emotion regulation strategies in children of anxious parents.

Conclusions

This study incrementally contributes to the overall knowledge of parenting science by identifying potential important leads on how emotion regulation moderates the link between parent's anxiety and parenting behaviors. This study adds insight into the way we conceptualize how anxiety affects parenting behaviors in multiple ways. First, when determining how anxiety affects parenting behaviors, this study shows that significant differences emerge when comparing trait anxiety versus current anxiety versus somatization. Future studies looking into the relationship between anxiety and behavior should include multiple facets of anxiety, such as both state and trait. Secondly, only non-self-report measures of emotion regulation significantly moderated the relationship between parent's anxiety and their behaviors. While non-significant, more self-reported difficulty in emotion regulation trended toward a moderating effect between high trait anxiety and lower reports of positive parenting. When possible, future studies should include both measures of self-report and physiologic emotion regulation in order to capture the full spectrum of emotion regulation. In addition, when observing changes in physiologic emotion regulation from a resting baseline phase to stress reactivity, calculating the rate of change through individual slopes may provide clearer insight into individual differences than change scores alone.

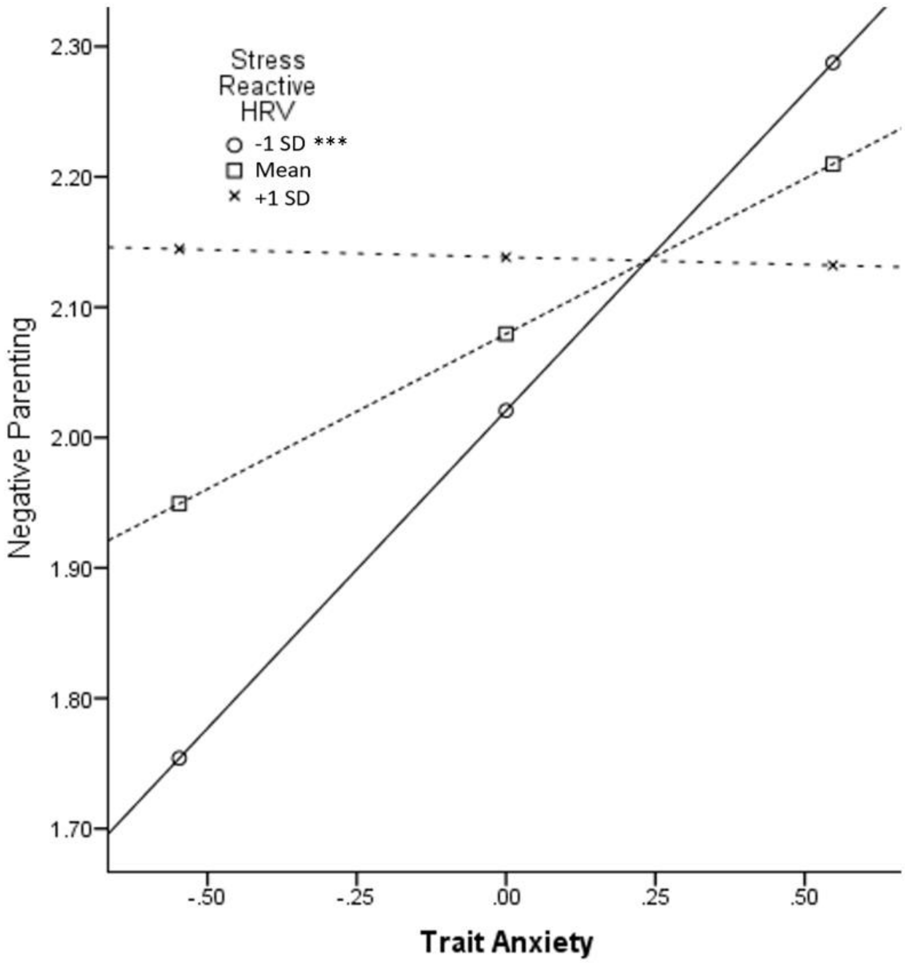

Figure 2. Moderating Effect of Stress Reactivity on Trait Anxiety and Negative Parenting

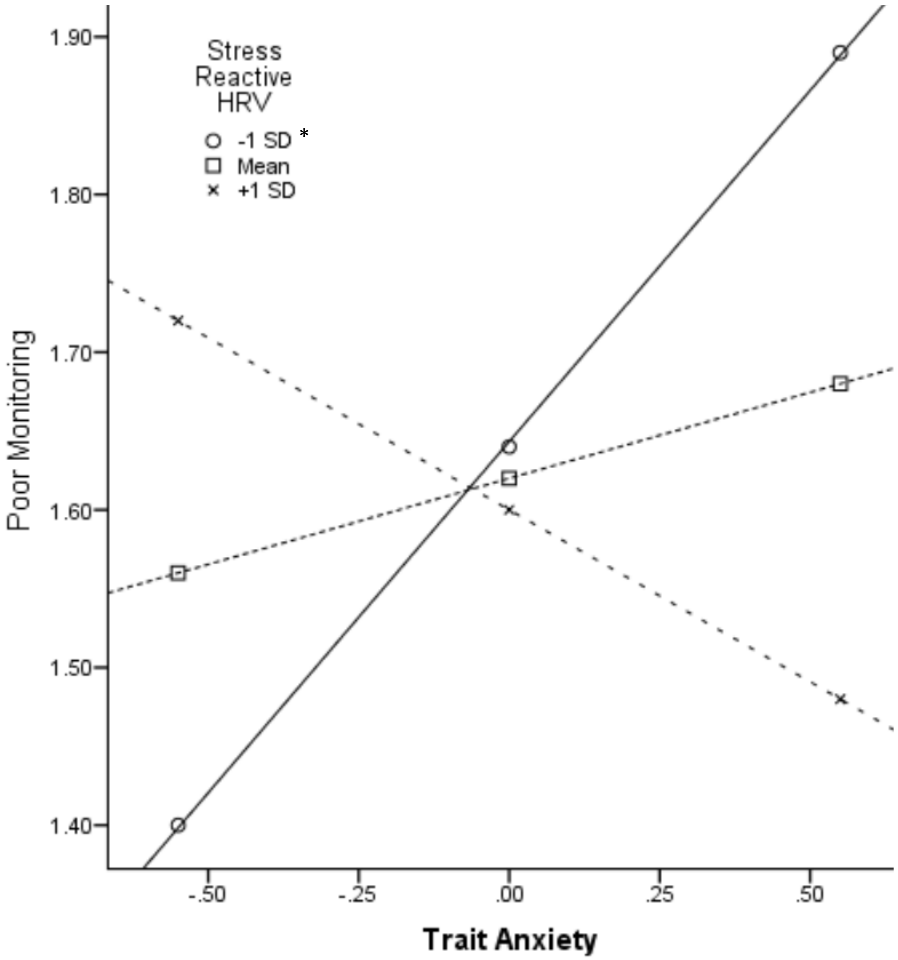

Figure 3. Moderating Effect of Stress Reactive HRV on Trait Anxiety and Poor Monitoring

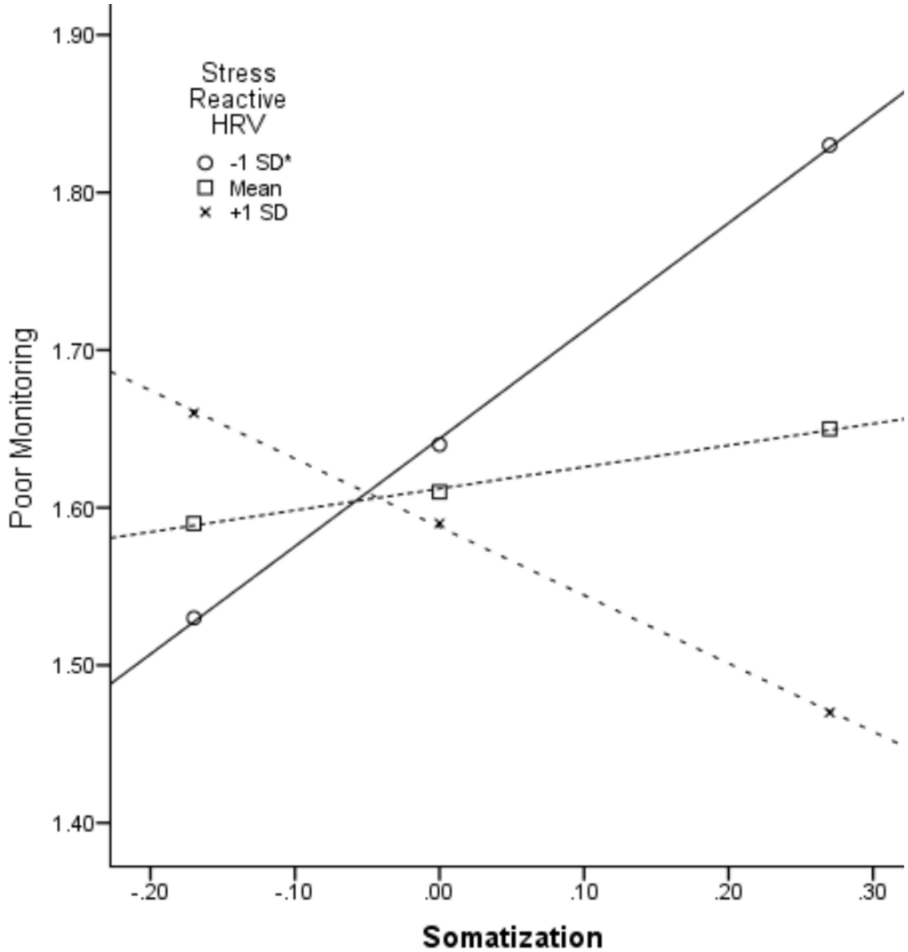

Figure 4. Moderating Effect of Stress Reactivity on Somatization and Poor Monitoring

Table 1. Demographics

Characteristic	M (*SD*)	Percentage
Age (in years)[a]	40.68 (*6.98*)	
20-29		02.5
30-39		45.6
40-49		39.2
50-59		12.7
Gender[b]	01.9 (*0.27*)	
Male		06.3
Female		77.1
Ethnicity[b]		
African American		36.3
Caucasian		47.5
Hispanic		08.8
Other		07.5
Family Income[b]		
< $20,000		32.5
$20,000 - $49,999		37.5
$50,000 - $79,999		13.8
> $80,000		16.3

Note. [a] = 17 missing, [b] = 16 missing

Table 2. Means, Standard Deviations, Ranges, Skew, and Kurtosis for Measures

	n	*M(SD)*	Min-Max	Skew(*St.E*)	Kurtosis(*St.E*)
Parent Symptoms					
Trait Anxiety	80	2.03(.53)	1.15-3.30	0.26(.26)	-0.67(.53)
BSI Anxiety	80	0.32(.40)	0.00-1.17	1.11(.27)	-0.13(.53)
BSI Somatization	80	0.17(.27)	0.00-0.83	1.40(.27)	0.59(.53)
Parent Emotion Regulation					
DERS	79	2.05(.46)	0.67-3.36	0.25(.27)	-0.21(.54)
Resting Baseline HF-HRV	73	2.50(.46)	1.47-3.52	-0.18(.28)	-0.33(.56)
Stress Reactive HF-HRV	71	-0.18(.31)	-0.83-0.37	-0.37(.29)	-0.63(56)
APQ					
Positive Parenting	80	4.01(.58)	2.38-4.94	-0.53(.27)	0.05(.53)
Negative Parenting	80	2.07(.48)	1.00-3.27	0.06(.27)	-0.18(.53)
Poor Monitoring	86	1.60(.53)	1.00-3.25	1.33(.26)	1.39(.51)

Table 3. Correlations

	1	2	3	4	5	6	7	8
1. Trait Anxiety								
2. BSI Anxiety	0.56***							
3. BSI Somatization	0.43***	0.32**						
4. Resting Baseline HRV	-0.15	0.01	-0.11					
5. Phasic HF-HRV	0.16	0.14	0.14	-0.32**				
6. DERS	0.67***	0.50***	0.29*	-0.19	0.27*			
7. Positive Parenting	-0.22*	0.11	0.03	-0.03	0.06	-0.26*		
8. Negative Parenting	0.28*	0.24*	0.13	-0.24*	0.12	0.36***	-0.11	
9. Poor Monitoring	0.14	0.20	0.04	-0.02	-0.08	0.31**	-0.25*	0.33**

Note. * = p < 0.05, ** = p < 0.01, *** = p < 0.001

Table 4a. Summary of Regression Models Predicting Positive Parenting - Resting HF-HRV

Variable	*B*	*SE*	*t*	*p*
Trait Anxiety	-0.26	0.13	-2.02	0.05
Resting HF-HRV	-0.08	0.15	-0.53	0.60
Trait Anxiety x Resting HF-HRV	0.10	0.32	0.32	0.32
	Model $R^2 = 0.06$, F (3, 69) = 1.38, $p = 0.26$			
BSI Anxiety	0.12	0.17	0.67	0.51
Resting HF-HRV	-0.05	0.15	-0.30	0.76
BSI Anxiety x Resting HF-HRV	0.62	0.36	1.72	0.09
	Model $R^2 = 0.05$, F (3, 69) = 1.21, $p = 0.31$			
BSI Somatization	-0.08	0.26	-0.28	0.78
Resting HF-HRV	-0.08	0.16	-0.50	0.62
BSI Somatization x Resting HF-HRV	-0.75	0.69	-1.09	0.28
	Model $R^2 = 0.02$, F (3, 69) = 0.43, $p = 0.73$			

Note. * indicates p < .05, ** indicates p < .01, † indicates trending significance

Table 4b. Summary of Regression Models Predicting Negative Parenting - Resting HF-HRV

Variable	*B*	*SE*	*t*	*p*
Trait Anxiety	0.24	0.10	2.35	0.02
Resting HF-HRV	-0.22	0.12	-1.80	0.08
Trait Anxiety x Resting HF-HRV	-0.11	0.26	-0.43	0.67
	Model $R^2 = 0.13$, F (3, 69) = 3.38, $p < 0.05$			
BSI Anxiety	0.34	0.14	2.51	0.01
Resting HF-HRV	-0.26	0.12	-2.16	0.03
BSI Anxiety x Resting HF-HRV	-0.46	0.28	-1.62	0.11
	Model $R^2 = 0.16$, F (3, 69) = 4.41, $p < 0.01$			
BSI Somatization	0.23	0.21	1.07	0.29
Resting HF-HRV	-0.22	0.13	-1.72	0.09
BSI Somatization x Resting HF-HRV	0.52	0.55	0.94	0.35
	Model $R^2 = 0.08$, F (3, 69) = 2.08, $p = 0.11$			

Note. * indicates p < .05, ** indicates p < .01, † indicates trending significance

Table 4c. Summary of Regression Models Predicting Poor Monitoring - Resting HF-HRV

Variable	*B*	*SE*	*t*	*p*
Trait Anxiety	0.08	0.11	0.72	0.47
Resting HF-HRV	0.00	0.13	0/03	0.98
Trait Anxiety x Resting HF-HRV	0.27	0.28	0.96	0.34
	Model $R^2 = 0.02$, F (3, 69) = 0.56, $p = 0.64$			
BSI Anxiety	0.19	0.15	1.30	0.20
Resting HF-HRV	-0.03	0.13	-0.19	0.85
BSI Anxiety x Resting HF-HRV	0.24	0.31	0.78	0.44
	Model $R^2 = 0.03$, F (3, 69) = 0.82, $p = 0.49$			
BSI Somatization	0.01	0.23	0.04	0.97
Resting HF-HRV	-0.01	0.14	-0.04	0.97
BSI Somatization x Resting HF-HRV	0.31	0.59	0.52	0.60
	Model $R^2 = 0.00$, F (3, 69) = 0.10, $p = 0.96$			

Note. * indicates p < .05, ** indicates p < .01, † indicates trending significance

Table 5a. Summary of Regression Models Predicting Negative Parenting – Stress Reactive HF-HRV

Variable	*B*	*SE*	*t*	*p*
Trait Anxiety	0.24	0.10	2.43	0.02
Stress Reactive HF-HRV	0.19	0.18	1.08	0.29
Trait Anxiety x Stress Reactive HF-HRV	-0.81	0.32	-2.50	0.02
	Model $R^2 = 0.16$, $F\ (3, 67) = 4.41$, $p < 0.01$**			
BSI Anxiety	0.31	0.14	2.20	0.03
Stress Reactive HRV	0.12	0.18	0.67	0.50
BSI Anxiety x Stress Reactive HF-HRV	-0.25	0.48	-0.53	0.60
	Model $R^2 = 0.08$, $F\ (3, 67) = 1.95$, $p = 0.13$			
BSI Somatization	0.27	0.21	1.27	0.21
Stress Reactive HF-HRV	0.19	0.18	1.01	0.32
BSI Somatization x Stress Reactive HF-HRV	-1.18	0.64	-1.84	0.07
	Model $R^2 = 0.07$, $F\ (3, 67) = 1.77$, $p = 0.16$			

Note. * indicates p < .05, ** indicates p < .01, † indicates trending significance

Table 5b. Summary of Regression Models Predicting Positive Parenting – Stress Reactive HF-HRV

Variable	*B*	*SE*	*t*	*p*
Trait Anxiety	-0.25	0.13	-1.93	0.06
Stress Reactive HF-HRV	0.15	0.23	0.63	0.53
Trait Anxiety x Stress Reactive HF-HRV	0.42	0.43	0.98	0.33
	Model R^2 = 0.07, *F* (3, 67) = 1.65, *p* = 0.19			
BSI Anxiety	0.15	0.18	0.80	0.42
Stress Reactive HF-HRV	0.09	0.24	0.38	0.70
BSI Anxiety x Stress Reactive HF-HRV	0.01	0.62	0.02	0.99
	Model R^2 = 0.01, *F* (3, 67) = 0.31, *p* = 0.82			
BSI Somatization	-0.16	0.26	-0.61	0.54
Stress Reactive HF-HRV	0.06	0.23	0.28	0.78
BSI Somatization x Stress Reactive HF-HRV	2.16	0.78	2.74	0.01
	Model R^2 = 0.10, *F* (3, 67) = 2.61, *p* = 0.06†			

Note. * indicates p < .05, ** indicates p < .01, † indicates trending significance

Table 5c. Summary of Regression Models Predicting Poor Monitoring – Stress Reactive HF-HRV

Variable	*B*	*SE*	*t*	*p*
Trait Anxiety	0.11	0.10	1.08	0.29
Stress Reactive HF-HRV	-0.06	0.19	-0.32	0.75
Trait Anxiety x Stress Reactive HF-HRV	-1.08	0.35	-3.11	0.00
	Model $R^2 = 0.15$, F (3, 67) = 3.80, $p < 0.001$***			
BSI Anxiety	0.24	0.15	1.56	0.12
Stress Reactive HF-HRV	-0.18	0.20	-0.92	0.36
BSI Anxiety x Stress Reactive HF-HRV	-0.13	0.52	-0.25	0.80
	Model $R^2 = 0.04$, F (3, 67) = 0.98, $p = 0.41$			
BSI Somatization	0.12	0.22	0.55	0.58
Stress Reactive HF-HRV	-0.09	0.19	-0.48	0.64
BSI Somatization x Stress Reactive HF-HRV	-1.81	0.66	-2.73	0.01
	Model $R^2 = 0.11$, F (3, 67) = 2.66, $p < 0.05$*			

Note. * indicates p < .05, ** indicates p < .01, *** indicates p < .001, † indicates trending significance

Table 6a. Summary of Regression Models Predicting Positive Parenting - DERS Moderation

Variable	*B*	*SE*	*t*	*p*
Trait Anxiety	-1.00	0.08	-0.61	0.55
DERS	-0.23	0.16	-1.45	0.15
Trait Anxiety x DERS	0.44	0.23	1.88	0.06
	Model $R^2 = 0.11$, F (3, 75) = 3.19, $p < 0.05^{\dagger}$			
BSI Anxiety	0.42	0.19	2.22	0.03
DERS	-0.46	0.13	-3.43	0.00
BSI Anxiety x DERS	0.19	0.28	0.69	0.49
	Model $R^2 = 0.16$, F (3, 75) = 4.64, $p < 0.01$			
BSI Somatization	0.14	0.26	0.53	0.60
DERS	-0.31	0.13	-2.44	0.02
BSI Somatization x DERS	0.20	0.44	0.47	0.64
	Model $R^2 = 0.07$, F (3, 75) = 2.02, $p = 0.12$			

Note. * indicates p < .05, ** indicates p < .01, † indicates trending significance

Table 6b. Summary of Regression Models Predicting Negative Parenting - DERS Moderation

Variable	*B*	*SE*	*t*	*p*
Trait Anxiety	0.06	0.13	0.48	0.63
DERS	0.29	0.13	2.25	0.03
Trait Anxiety x DERS	-0.27	0.19	-1.42	0.16
	Model $R^2 = 0.5$, F (3, 75) = 4.53, $p < 0.01$			
BSI Anxiety	0.14	0.16	0.86	0.39
DERS	0.28	0.11	2.52	0.01
BSI Anxiety x DERS	-0.12	0.23	-0.50	0.62
	Model $R^2 = 0.14$, F (3, 75) = 3.95, $p < 0.01$			
BSI Somatization	0.10	0.21	0.50	0.62
DERS	0.33	0.10	3.22	0.00
BSI Somatization x DERS	-0.41	0.35	-1.17	0.25
	Model $R^2 = 0.14$, F (3, 75) = 4.20, $p < 0.01$			

Note. * indicates p < .05, ** indicates p < .01, † indicates trending significance

Table 6c. Summary of Regression Models Predicting Poor Monitoring - DERS Moderation

Variable	*B*	*SE*	*t*	*p*
Trait Anxiety	-0.12	0.14	-0.88	0.38
DERS	0.38	0.14	2.69	0.01
Trait Anxiety x DERS	-0.07	0.20	-0.36	0.72
	Model $R^2 = 0.11$, F (3, 75) = 2.95, $p < 0.05$			
BSI Anxiety	0.02	0.17	0.14	0.89
DERS	0.27	0.12	2.25	0.03
BSI Anxiety x DERS	0.17	0.25	0.71	0.48
	Model $R^2 = 0.10$, F (3, 75) = 2.88, $p < 0.05$			
BSI Somatization	-0.04	0.22	-0.20	0.84
DERS	0.30	0.11	2.78	0.01
BSI Somatization x DERS	-0.10	0.38	-0.26	0.80
	Model $R^2 = 0.10$, F (3, 75) = 2.67, $p < 0.05$			

Note. * indicates p < .05, ** indicates p < .01, † indicates trending significance

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