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Tejal Patel

University of New Orleans, tpatel1@uno.edu

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The Role of Temperamental Fear and Parenting Quality on Emerging Internalizing and Externalizing Problems During Early Childhood

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
Applied Developmental Psychology

by

Tejal Patel

B.S. Virginia Polytechnic Institute and State University, 2016

May, 2019

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Abstract

Temperamental characteristics may distinguish which children are at greater risk for later psychopathology. In addition, parenting quality may interact with the association between temperament and behavior problems to increase or decrease externalizing or internalizing behaviors in children. This study examined whether mothers' parenting quality moderated the associations between children's temperamental fear and children's behavior problems. The sample consisted of 143 low-income mother-child dyads who participated in various interactional tasks designed to measure mothers' parenting and children's temperamental fear. While children's fearless and fearful temperament were not significantly associated with externalizing and internalizing behaviors, respectively, some significant associations emerged. Positive and negative parenting were negatively associated, negative parenting and fearful temperament were positively associated, fearful and fearless temperament were negatively associated, and internalizing and externalizing behaviors were positively associated. Finally, results from moderation analyses indicated no significant interaction effects of parenting quality and children's temperamental fear on children's problem behavior.

Keywords: Parenting, Child Behavior, Temperament, Internalizing, Externalizing

Introduction

Although approximately 18 percent of adults in the U.S. suffer from psychiatric disorders (National Institute of Mental Health, 2017), the actual prevalence rates are likely much higher because many disorders are undiagnosed (LaVonne, Sun, & Burke, 2012). Clinically significant levels of psychopathology are often diagnosed first during late adolescence and early adulthood (e.g., Skodol et al., 2005). Behavior problems typically precede clinical diagnoses and begin during childhood (Rose, Rose, & Feldman, 1989). Two different types of behavior problems during early childhood are common, internalizing and externalizing. Internalizing problems such as depression or anxiety often begin during early childhood with feelings of sadness, excessive worry, and fearfulness (Zahn-Waxler, Klimes-Dougan, & Slattery, 2000); often seen during separation anxiety. Externalizing behavior problems include symptoms of unregulated anger, fighting, and the inability to focus and sustain attention (Hill, Degnan, Calkins, Keane, 2006). When symptoms of internalizing or externalizing behavior problems emerge during childhood and persist into adolescence, risk for clinically significant psychosocial problems during adolescence and adulthood increases (King, Lacono, & McGue, 2004; Masten et al., 2005).

Not all children who experience behavior problems during early childhood develop psychopathology during adolescence or adulthood. Temperamental characteristics may distinguish which children are at greater risk for later psychopathology (Nigg, 2006). Rothbart and Derryberry (1981) define temperament as biologically-based individual differences in emotional or behavioral reactivity and self-regulation. Dimensions of temperament include positive emotionality, activity level, fearfulness, anger/frustration, attentional orienting, and effortful control (Rothbart et al., 2012). Children with poor effortful control, or who are unable to regulate impulsive behavior, and low tolerance for frustration, may be at increased risk for

externalizing behavior problems (Rothbart, Derryberry, et. al, 1994). In contrast, a propensity towards social anxiety and social withdrawal may increase risk for later internalizing behavior problems (Rothbart, Derryberry, et. al, 1994). Interestingly, variations in temperamental fear have repeatedly been linked to both internalizing and externalizing problems. That is, children who evidence high levels of fearlessness, or high levels of impulsivity and approach to novelty, seem to be at greater risk for externalizing problems, while children who evidence high levels of fearfulness, or more socially reticent and avoidant behaviors, are at greater risk for problems with anxiety and depression problems (Nigg, 2006). The current investigation examines how variations in fearful temperament are associated with levels of externalizing and internalizing problems during childhood.

Temperamental characteristics alone may confer somewhat minimal risk for later adjustment difficulties. Environmental characteristics, like parenting quality, may distinguish which children go on to develop behavior problems. During the preschool years, children are exposed to both negative and positive parenting. Negative parenting is defined as emotionally negative and behaviorally controlling discipline (Barnett & Scaramella, 2017). Negative parenting has been linked to increases in both internalizing and externalizing behavior problems during childhood (Morris, Silk, et al., 2002). In contrast, positive parenting is defined as emotionally warm and behaviorally supportive and encouraging (Barnett & Scaramella, 2017). Positive parenting provides clear expectations for behaviors and has been associated with generally low levels of child behavior problems (Bornstein, 2005; Sanders, 1999).

Theoretically, the quality of parenting children receive may interact with temperamental characteristics to influence later adjustment (e.g., Pluess & Belsky, 2010). Differential susceptibility theory suggests that different environmental characteristics, such as parenting

quality, interact with individual characteristics, like temperament, to influence adjustment, for either “better” or “worse” (Belsky, 1997; Pluess & Belsky, 2010). For instance, children with fearful temperament and who receive negative parenting may be at increased risk for internalizing problems, but not when receiving positive parenting. In other words, high levels of fearful temperament only increases risk for internalizing problems within a context of more negative parenting. In contrast, fearless children may benefit more from exposure to more positive parenting (Park, Belsky, Putnam & Crnic, 1997) and may experience more externalizing problems when parents use less positive parenting (Dishion, Shaw, Gardner, Weaver, & Wilson, 2008). Thus, high levels of fearless temperament only increases risk for externalizing problems in the context of low positive parenting.

The goal of the present study is to examine the influence of parenting quality on the association between children’s temperamental fear and problem behaviors during the preschool period. The first section of this review will discuss the developmental significance of early childhood for the emergence of problem behaviors. This section will describe the typical progression of internalizing and externalizing behaviors during early childhood. Next, variations of temperamental fear on internalizing and externalizing problems will be described. Finally, the role of parenting quality as moderating the association between temperamental fear and children’s problem behaviors will be discussed.

Early childhood and the emergence of problem behaviors

Early childhood is characterized by rapid increases in social and communication skills. Specifically, early childhood is noted for dramatic gains in fine motor skills, language development, social and empathic behavior, and basic reading/literacy skills (Lonigan, Burgess, & Anthony, 2000). Early childhood also is associated with increases in social interaction with

individuals outside of the home (Hartup, 1989). Children often are expected to interact with peers in a positive manner. That is, children are expected to cooperate, share, negotiate, compromise, and autonomously resolve disputes with peers (Parker et. al, 2006). Parents begin to expect children to be regulate their emotions to match situational demands (Morris, Silk, Steinber, Myers, & Robinson, 2007).

While the preschool period is important for the emergence of positive social behavior, the period also is noted for increases in willful defiance and bouts of unregulated emotions (Johnson, Christie, Yawkey, & Wardle, 1987; Kochanska, Murray, & Harlan, 2000). Regulating negative emotions such as fear, are real challenges for children and children often rely on parents for emotion regulation guidance (e.g., Eisenberg, Spinrad, & Eggum, 2010; Shaw & Bell, 1993). When problem behaviors do not dissipate after the preschool period, children are at greater risk for developing psychopathology during later developmental periods (i.e., stability of behaviors over time; Bornstein, Hahn, & Haynes, 2010; Campbell, Shaw, Gilliom, 2000).

Problems with regulating uninhibited and impulsive behaviors may increase children's risk for developing externalizing behavior problems (Rydell, Berlin, & Bohlin, 2003). Although externalizing behaviors are typical during the toddler years, individual differences exist in the frequency and intensity of such behaviors. Typically, externalizing behaviors peak around age 3 (i.e., temper tantrums) and decline throughout the preschool period, or about age 6 (Gilliom & Shaw, 2004). Externalizing behavior problems during early childhood often include hyperactive, defiant, impulsive and tantrum-like behaviors (Hill, Degnan, Calkins, & Keane, 2006). Children who enter school unable to regulate their uninhibited and impulsive behaviors may experience more disciplinary problems at school (Morrison, Ponitz, & McClelland, 2010) and learning delays, or poor academic achievement (Howse, Lange, Farran, & Boyles, 2003).

In contrast to externalizing symptoms, internalizing symptoms tend to onset during the preschool years and gradually increase throughout childhood (Gilliom & Shaw, 2004). Early indicators of internalizing symptoms are hard to recognize. That is, some fearful and wary behaviors are typical of toddler and preschool children, particularly during social situations (Fox & Field, 1989). For instance, separation anxiety is common during the preschool period (Hudson, Dodd, & Bovopoulos, 2011). Separation anxiety reflects children's distress upon separation from a parent, such as when parents leave children with a babysitter, daycare, or preschool setting; separation anxiety is often short-lived and decreases with age (Compton, Nelson, & March, 2000). Although separation anxiety is elevated during the toddler and preschool years, separation anxiety also increases for children upon entry into kindergarten or first grade; as children become more comfortable in the context, separation anxiety decreases (Battaglia et al., 2016).

Internalizing symptoms are easily missed during early childhood because, as described, some fearfulness is typical during the preschool period and these behaviors are generally less disruptive than externalizing behaviors (Tandon, Cardeli, & Luby, 2009). The masked, slow progression of internalizing symptoms can manifest into externalizing behaviors later in childhood (Bornstein, Hahn, & Hayes, 2010). Similarly, externalizing behaviors in early childhood can manifest into internalizing problems during preadolescence (Gilliom & Shaw, 2004; Rose, Rose, & Feldman, 1989; Mesman, Bongers, & Koot, 2001). The lack of clear pathways to internalizing and externalizing problems may be due in part to the overlap in behavioral expression during early childhood (Willner, Gatzke-Kopp, & Bray, 2016). For example, one symptom of externalizing problems is temper tantrums; temper tantrums are defined by yelling, kicking, crying, and running away. Separation anxiety, a characteristic of

internalizing problems, often includes crying, screaming, kicking and running away. Thus, the same observed behaviors are used to describe both externalizing and internalizing symptoms (Fanti & Henrich, 2010).

Measurement issues also complicate observed comorbidity of internalizing and externalizing problems. As described, self-report measures of internalizing and externalizing behaviors are often highly correlated because of the overlap in symptoms that comprise the two constructs (Willner, Gatzke-Kopp, & Bray, 2016). If kicking, crying, and running away, for instance, are characteristics of both internalizing and externalizing problems, then children with internalizing symptoms also will have externalizing symptoms. Second, when relying on self-report measures, the same questionnaire is often used to measure internalizing and externalizing symptoms; shared method variance may inflate the level of comorbidity (Goodman & Scott, 1999). Shared method variance reflects covariation which is due to the common perspective used to rate both constructs (Goodman & Scott, 1999). One way to reduce, but not eliminate, the effect of shared method variance and the naturally occurring covariation between internalizing and externalizing symptoms is to statistically control the level of internalizing symptoms, for instance, when estimating externalizing symptoms and vice versa. In the present study, all statistical models will control for the covariation of internalizing and externalizing behaviors.

Variations in temperamental fear and children's problem behaviors

Temperament has been defined as biologically-based individual differences in how individuals react to stimuli (Rothbart, 2007). Specifically, temperament includes the propensity to react to novelty with emotions, sensitivity in the level of stimuli needed to evoke an emotional response, and variability in effortful control (Rothbart, Posner, & Hershey, 2006; Rothbart 2007). Additionally, individuals vary in their ability to perceive environmental events, their

reactions to those events and their ability to control emotional responses. Temperamental fear involves variability in individuals' propensity to approach or avoid novel stimuli or situations (Rothbart & Bates, 2006). More fearful children tend to avoid novelty and are more reluctant to leave parents in new situations and to interact or play with strange peers (Coplan, Matheson, Schneider, & Graham, 2010). Fearful behavior first appears during infancy (e.g., 8 or 9 months of age; Honig, 1987). Upon school entry, fearful children may find the social structure of the classroom daunting and stressful (Rimm-Kaufman & Kagan, 2005). While some inhibition during the preschool period is expected, elevated and sustained levels of fearfulness increases risk for developing internalizing behavior problems (Rapee, 2014). Importantly, fearful children who experience strong negative emotional reactions in low threat situations are at greatest risk for developing anxiety disorders later in development (Lonigan, Vasey, Phillips, & Hazen, 2004; Tandon, Cardeli, & Luby, 2009).

In contrast, more fearless children respond to novelty or new situations with eagerness, excitement, and approach (Dennis, 2006). Highly fearless children have a greater threshold for arousal than children with average levels of fearlessness (Dennis, 2006). During the preschool period, some fearlessness is expected because children have not developed the cognitive skills to perceive danger or to anticipate worry (Grieve & Williams, 1985). For instance, children may not fear crossing the street because they do not yet understand the dangers associated with the street. Moreover, low levels of fearlessness may even be beneficial for preschoolers. That is, some fearlessness is needed to positively engage with new children, new situations (e.g., school), or new activities. While low levels of fearlessness may be associated with eagerness to engage in new activities, high levels of fearlessness is more problematic and has been associated with more externalizing behavior problems (Burgess, Marshall, Rubin, & Fox, 2003; Frick & White, 2008).

Developmental stability in fearlessness has been demonstrated and high levels of fearlessness during the preschool period may be a marker for increased risk for conduct problems during adolescence (Barker, Oliver, Viding, Salekin, & Maughan, 2011).

In the present study, variations of temperamental fear are expected to be associated with externalizing and internalizing symptoms. Specifically, children observed to be more fearful are expected to be rated higher on internalizing symptoms, after accounting for externalizing symptoms, than less fearful children. Similarly, children observed to be more fearless, or eagerly approach strange and novel stimuli, are expected to be rated as higher on externalizing symptoms, net of internalizing symptoms, than less fearless children.

Parenting quality moderates the association between temperamental fear and children's problem behaviors

Although variations in temperamental fear may influence risk for internalizing or externalizing problems, social contexts may interact with temperamental fear to influence children's adjustment. Parenting is one such context that may affect the strength of the association between temperamental fear and child adjustment. During early childhood parents actively begin to shape their children's behavior and to increase their expectations for autonomous child behavior (Hoover-Dempsey & Sandler, 1997). During early childhood, parents expect children to self-regulate their behaviors and emotions to comply with parental demands and requests. How parents communicate their expectations to children can influence children's adjustment.

Positive parenting is defined as parenting behavior that is warm, affectionate, sensitive, and responsive to children (Davidov & Grusec, 2006; Russell, 1997). Sensitive behaviors refer to

the parents' ability to be actively aware of their child's needs, or signals of distress (Lamb & Easterbrooks, 1981). Responsiveness occurs when parents are able to quickly and accurately act on children's needs and bids for attention (Gottman & DeClaire, 1997; Davidov & Grusec, 2006). Parents who use positive parenting can provide critical guidance for their children when children experience difficulty regulating negative emotions or behaviors. That is, positive parenting helps to defuse an emotionally charged situation, like children's bouts of unregulated anger, and does not escalate or intensify children's negativity (e.g., Scaramella & Leve, 2004). Positive parenting also has been described as 'child-centered' rather than 'parent-centered' because positive parenting is responsive to children's needs. By attending to children's behavior, parents can more effectively monitor situations that are likely to pose emotion or regulatory challenges for children (Scaramella & Leve, 2004). Thus, positive parenting not only models well-regulated emotions, such parents serve as a resource for children during times of need. Positive parenting provides children with emotional guidance when they become emotionally distressed or overwhelmed. This becomes especially important to developing children's social competence, which can facilitate the transition to school entry during preschool (Denham, Mitchell-Copeland, Strandberg, Auerbach, Blair, 1997).

For fearful children, positive parenting may be a critical resource needed to teach children effective regulation and to reduce risk for internalizing problems. When confronted with a novel situation, fearful children may look to mothers for clues as to the level of danger or fear in a situation (i.e., social referencing; Gerull & Rapee, 2002). Parents who model encouragement and support may de-escalate children's fear more effectively than mothers who ignore or punish children's distress (Kochanska, 1995; Rubin, Burgess, & Hastings, 2002). Thus, positive parenting may be associated with lower levels of internalizing in part because positive parenting

also de-escalates children's fearful emotions (Feinberg, Kan, & Goslin, 2009; Mesman, van IJzendoorn, & Bakermans-Kranenburg, 2012).

Similarly, positive parenting reduces the risk of externalizing problems among temperamentally fearless children. Fearless children benefit the most from environments that emphasize rewards rather than punishment (Kochanska, 1997; Putnam, Sanson, & Rothbart, 2002). In other words, fearless children do not fear punishment (Frick & Morris, 2004). Instead, fearless children respond to high quality relationships. While avoidance of punishment is not a motivation for compliance for fearless children, pleasing parents and obtaining rewards are motivating (Frick, Ray, Thornton, & Kahn, 2014). Parents who are actively engaged and involved in their children's lives will be better at monitoring their peer relationships and activities, thereby reducing their children's exposure to environments that may increase risk for externalizing problems (Dishion, McMahon, 1998; Pettit, Laird, Dodge, Bates, & Criss, 2001). Lastly, positive parenting reduces externalizing problem behaviors among fearless children by modeling socially appropriate behaviors (Sanders, 1999). When parents use positive parenting, they can help regulate their temperamentally fearless children's impulsive and uninhibited behaviors (Putnam, Sanson, & Rothbart, 2002), especially within the context of social settings.

Negative parenting occurs when parents' attempts to manage children's behaviors are harsh, coercive, and inconsistent (Kliff, Lengua, & Zalewski, 2011). Parents who use negative parenting are often detached, emotionally negative, physically intrusive, insensitive, and use parent-centered parenting goals rather than child-focused parenting (Lansford et al., 2003). Negative parenting communicates to children that parents' needs are more important than children's and diminishes children's sense of autonomy and self-worth (Roth, Assor, Niemiec, Ryan & Deci, 2009). Additionally, negative parenting restricts social emotional development by

modeling poor social skills and reactive behavior (Scaramella & Leve, 2004). Negative parenting also exacerbates problem behaviors. Specifically, harsh, punitive actions and low warmth or support can positively reinforce negative behaviors in young children, such as aggressive and oppositional behaviors (Akhter, Hanif, Tariq, & Atta, 2011; Stormshak, Bierman, McMahon, & Lengua, 2000) and deceitfulness (Waller, Gardner, Hyde, Shaw, Dishion, & Wilson, 2012).

Fearful children in particular may benefit from parenting that is less negative, or harsh and controlling and more positive and supportive. Kochanska (1995) argues that fearful children have a lower threshold for negative control because even low levels of firm discipline and negative control can be anxiety provoking (see also Hudson, Dodd, Bovopoulos, 2011; Scaramella & Leve, 2004). While positive parenting de-escalates fearful children's negative affectivity, negative parenting increases fear dysregulation, thus prompting more internalizing behaviors. For example, when exposed to harsh discipline, temperamentally fearful children seem to be at greater risk for developing more depressive symptoms during childhood, possibly because harsh discipline restricts children's opportunity to learn and amend their own behavior (Colder, Lochman, and Wells, 1997). Similarly, intrusive and controlling parenting seems to increase internalizing problems in large part because such parenting communicates to children an inability to cope without parents and reinforces children's fearful and anxious behaviors (Bayer, Sanson, Hemphill, 2006).

In contrast, the mechanism by which negative parenting influences temperamentally fearless children may be different. Fearless children do not seem to fear harsh discipline or harsh punishment (e.g., Cornell & Frick, 2007; Pardini, 2006). Negative parenting does, however, model antisocial behavior and positively reinforce antisocial and disruptive behavior (Kimonis, Frick, Boris, Smyke, Cornell, Farrell, Zeanah, 2006). At the same time, negative parenting

provides little guidance for children on how to regulate or manage impulsive and fearless behavior (Frick & Morris, 2004).

The Current Study

Beyond the additive effects of child temperamental fear and parenting quality, there is a likelihood that temperamental fear and parenting quality interact to influence child adjustment (Putnam, Sanson, & Rothbart, 2002). Quite possibly, variations in fearful temperament leave children differentially susceptible to internalizing or externalizing problems, depending on the quality of parenting they receive (Stright, Gallagher, & Kelly, 2008). This study will consider whether parenting quality moderates the expected statistical association between children's temperamental fear and children's internalizing and externalizing problems.

Hypothesis 1: Fearful temperament, specifically high levels of avoidance, will be positively correlated with internalizing scores, after controlling for externalizing scores.

Hypothesis 2: Fearless temperament, specifically high levels of approach, will be positively associated with externalizing scores, after controlling for internalizing scores.

Hypothesis 3: Associations between dimensions of temperamental fear and internalizing or externalizing problems will vary based on parenting quality. Specifically:

- a. As positive parenting increases, the statistically significant association between fearful temperament and internalizing scores will become non-significant.
- b. As negative parenting increases, the association between fearful temperament and internalizing scores will strengthen.

- c. As positive parenting increases, the statistically significant association between fearless temperament and externalizing scores will become non-significant.
- d. As negative parenting increases, the association between fearless temperament and externalizing scores will strengthen.

Methods

Participants

Participants ($n = 144$ mother-child dyads) were recruited from the rural, gulf coast region of Alabama. Mother-child dyads completed one in-home visit during which mothers completed a questionnaire and the dyads were videotaped during interactional tasks. Dyads were predominately African American (49%; 41% white, 5% mixed, < 2% Hispanic, < 3% Asian, < 2% Native American). Children were between 3 and 6 years of age ($M = 3.96$ years, $SD = 0.83$; 54% male) and mothers were between 20 and 69 years of age ($M = 31.76$, $SD = 9.03$). Approximately 48 percent of mothers were married or living with a romantic partner. The majority of mothers graduated high school (64%), with 27 percent reporting some education beyond high school. About half (50.5%) of the mothers were not working for pay at the time of the assessment, 28.8 percent were working full time and 20.7 percent were working part time or temporary. Families were majority low-income; 68.8 percent of the families were living below the 2015 federal poverty guideline for income-to-needs.

Procedures

The Institutional Review Board of the affiliated researchers approved all measures and procedures for this study. One or two research assistants visited the dyads in their home. One research assistant was designated the interviewer and directed all aspects of the interview. A second research assistant was used to supervise other children in the home, when necessary. Mothers completed several questionnaires with assistance, when needed. Relevant to the current study, mothers completed demographic information and reported on their children's problem behaviors. Mothers and children completed a number of interactional tasks, some of which were designed to measure parenting and children's temperamental fear. Mother and child structured tasks lasted about 1 hour and were videotaped. Three mother-child activities were used to measure parenting behaviors and included a puzzle completion activity, a toy clean-up activity, and a competitive matching game. Two child-only activities were used to measure temperamental fear, a scary mask task and a spider task.

Upon arrival to the home, the lead interviewer reviewed and obtained consent from mothers. At this time, mothers were provided with an activity list and an overview of the structure of the interview. The interview began with a brief mother-child play period. The puzzle activity followed the brief play period. Interviewers showed the dyad a completed puzzle of the United States. After mothers and children looked at the puzzle carefully, the interviewer then flipped the puzzle to remove the pieces. Mothers were instructed to provide any assistance with the puzzle but to let children complete the puzzle on their own; the task lasted 5 minutes.

After the puzzle completion activity, mothers moved to another room or away from their children to complete questionnaires. Children then completed a series of temperament tasks. The scary mask and a toy spider tasks were adapted from the Laboratory Temperament Assessment Battery for preschoolers (Goldsmith, Reilly, Lemery, Longley, & Prescott, 1999). The spider

task was administered first. To begin, children were instructed to sit on a designated spot on a mat and facing an iPad that recorded the task. The interviewer exited the room and reentered with a toy spider in a plastic container. The interviewer sat down next to the children and asked the child to pet the spider. If children attempted to touch the spider, the interviewer pressed a squeeze ball that made the spider either jump or squeak. After startling children, interviewers replied, “Oh! It jumped. That’s okay, you can try again.” This sequence was repeated until children had touched the spider four times in a row or refused to touch four times in a row. After the fourth time, interviewers told children that the spider was toy and showed the children how to use the squeeze ball.

The second temperamental fear task was the scary mask task. Before beginning the activity, interviewers talked to children for about 30 seconds to ensure children were in a calm and alert state. Interviewers left the room, placed the mask on their head, and returned sitting about 2 feet from children but not blocking the camera. Interviewers sat for 30 seconds without moving. After 30 seconds, interviewers removed the mask and held the mask under their chin. After 30 seconds, interviewers removed the mask and placed it on the ground. After 10 seconds, interviewers explained that the lion was only a mask and encouraged children to touch or try on the mask. After 20 seconds, interviewers ended the task.

Upon completing the temperament tasks, mothers re-joined children. Mothers and children were given a set of toys to play with for 10 minutes. After 10 minutes, the interviewer joined mothers and children in playing. Interviewers took a few minutes to play with mothers and children and to spread out any unused toys. This procedure standardized the amount of “mess” to be cleaned up. Mothers were then instructed that it was clean up time and children needed to clean up all the toys. Mothers were free to offer any assistance needed, but children needed to

clean up the toys. Interviewers returned after five minutes and helped clean up any remaining toys.

The final activity was a competitive matching game. Interviewers taught mothers how to play the game. Mothers were provided with a deck of 14 picture cards had two cards that were the same picture. After laying all the cards face down, mothers and children would flip over two cards at a time to find the matching pairs. If the cards matched, the cards were removed from the play and that person received a point. Play continued until all matches were made. If mothers and children finished the game before the interviewer returned, they were instructed to play the game again. The game lasted three minutes.

Following data collection, teams of temperament coders were trained to code the scary mask and spider tasks and teams of parenting coders were trained to code the mother-child interactional tasks. Importantly, different teams of coders rated temperament and parenting. Regardless of the team, all coders received about 4 weeks of training until excellent reliability was obtained ($ICC > .80$). Efforts to monitor coding reliability after the training period included: double-coding 25 percent of the tasks, weekly meetings to discuss discrepancies in coding, and coder agreement upon discrepancy discussion.

For the temperamental fear tasks, coders rated the intensity of children's avoidance of the spider or scary mask and approach of the spider or lion mask during each of the trials. Trials were defined by the length of time between the change in activity. For instance, for the lion mask, three trials were defined, the 30-second period in which the interviewers sat with the mask on their heads, the 30-second period in which interviewers held the mask under their chin, and the 30-second period in which the mask was on the ground. The spider task trials varied in length but included three different trials. Trials were then divided into 10-second epochs. Epochs less

than 5-seconds in length were not coded. For the scary mask, the number of epochs varied but did not exceed 3 epochs for each trial. Each trial had a minimum of 1 epoch and any epochs less than 5 seconds in duration were not coded. Avoidance and approach behaviors were rated on a 4-point Likert scale, with higher scores indicating a greater intensity of avoidance or approach behavior.

Observational ratings of the puzzle, clean-up, and matching tasks were adapted from rating scales from the NICHD Study of Early Child Care (NICHD Early Child Care Research Network, 1999). Relevant to the current study, coders rated mothers' sensitivity, positive regard for child, stimulates cognitive development, intrusiveness, and negative regard for child. Mothers' parenting behaviors towards children were rated on a 7-point Likert scale ranging from not at all characteristic (1) to highly characteristic (7). Scoring balanced frequency of observed behaviors with the intensity of behaviors or affect.

Measures

The following section describes the measures used to create the constructs and the procedures used for creating singular scores for each construct.

Temperamental Fear. Behaviors observed from the same temperament tasks were used to measure fearful temperament and fearless temperament. Fearfulness was defined as children's propensity to avoid novel and unpredictable stimuli. Fearfulness was measured by children's avoidance observed during each trial of the spider and lion mask tasks. To measure fearfulness, peak avoidance scores from each trial of the scary mask and spider tasks were used (see also Barnett & Scaramella, 2017). That is, across the epochs of a single trial, the highest score, or the score reflecting the most intense avoidant behavior, was used to measure avoidance during that

trial. Peak intensity scores were averaged across trials separately for the lion mask and spider tasks. If children ended a task early because of extreme fear, the average of the available scores were used to measure avoidance. Lion mask and spider task avoidance scores were statistically significant and positively correlated ($r = .39, p < .01$), so a composite avoidance indicator was created by averaging the two avoidance indicators.

Fearlessness was defined as children's propensity to approach novel and unexpected objects. Fearlessness was measured by children's approach behaviors during lion mask or toy spider. Following the same procedures to be used for avoidance, peak approach scores from each of the trials observed during the lion mask and spider tasks were used. The peak score across each trial were averaged separately for the lion mask and spider tasks. Approach scores were statistically significant and positively correlated, ($r = .24, p < .01$), so a composite approach indicator was created by averaging the two approach indicators.

Mothers' Parenting. Mothers' parenting behaviors were measured from codes generated from the puzzle completion, clean up, and matching tasks. Positive parenting is defined as mothers' ability to sensitively respond and assist their children during the interactional tasks. Positive parenting will include the sensitivity, positive regard, and stimulates cognitive development codes. Sensitivity refers to mothers' ability to balance encouragement and autonomy for the child (e.g., mothers are responsive to child's needs, facilitate play or transition). Positive regard is defined as mothers' expressions of affection, warmth, praise, or supportive behavior towards their children (e.g., speaking in a warm tone, praising child during participation). Stimulates cognitive development is the extent to which mothers foster their children's cognitive and language development (e.g., explaining or demonstrating task activity to child). The three positive parenting codes were averaged within tasks (e.g., puzzle completion

task) to create three different indicators of positive parenting. The three indicators were statistically significantly and positively correlated; thus a positive parenting score was created by averaging across the three indicators to create a single positive parenting composite score.

Negative parenting is defined as mothers' behaviors that exhibited negative, harsh responses to the child during the tasks. Negative parenting was measured by intrusive behavior and negative regard for child codes. Intrusiveness refers to any physical or verbal behavior by the parent that interrupted their children's efforts during the task (e.g., unwanted physical contact, over-structuring child's participation in task). Negative regard is defined as mothers' expressions of angry, irritable, or emotionally negative behavior. The two negative parenting codes were averaged within tasks (e.g., puzzle completion task) to create three different indicators of negative parenting. These negative parenting indicators were statistically significantly and positively correlated; thus a negative parenting score was created by averaging across the three indicators to create a single negative parenting composite score.

Children's problem behaviors. Internalizing and externalizing scores were calculated using the Child Behavior Checklist for Ages 1.5-5 (Achenbach, 1994). Mothers rated various behaviors their child may have exhibited in the past two months, on a 3-point scale (0 = not at all true, 1 = sometimes true, 2 = always or often true). An internalizing score was created by averaging 25 internalizing items the mother endorsed (i.e., nervous movements or twitching, shy or timid, etc.) from the anxious/depressed and withdrawn subscales. An externalizing score was created by averaging 26 externalizing items the mother endorsed (i.e., angry moods, hits others, always on the go, etc.) from the aggressive and destructive behavior subscales.

Results

Prior to testing hypotheses, basic descriptive statistics and correlations were computed. First, means and standard deviations were computed. As demonstrated in Table 1, levels of positive and negative parenting were rather low. While mothers were observed to use more positive parenting than negative parenting, even levels of positive parenting were below the midpoint. Greater variability was observed for positive as compared to negative parenting. On average, mothers used little to no negative parenting during the interactions. Regarding fearful temperament, children exhibited very little fearful behavior and moderate levels of fearless behavior. In addition, more variability in fearless behavior was observed than in fearful behavior. Finally, mothers reported that generally low levels of internalizing and externalizing behaviors among their children.

Table 1. Descriptive Statistics

Constructs	M	SD	Possible Range*
Positive Parenting	3.35	0.72	1-7
Negative Parenting	1.75	0.54	1-7
Fearful Temperament	0.50	0.70	0-3
Fearless Temperament	1.45	0.81	0-3
Internalizing Behaviors	0.45	0.27	0-2
Externalizing Behaviors	0.52	0.29	0-2

*larger values indicate greater intensity/frequency of behavior

Next, correlations were computed to ensure that the study constructs were associated in theoretically expected ways (see Table 2). As expected, positive parenting and negative parenting were statistically significantly and negatively correlated ($r = -.23, p < .01$). Moreover, positive and negative parenting were modestly correlated indicating that positive and negative parenting were not opposite ends of a continuum. Not surprisingly, more fearful temperament

was associated with less fearless temperament ($r = -.48; p < .01$) and internalizing and externalizing behaviors were positively correlated (Table 2).

Table 2. Bivariate correlations among study constructs

Constructs	1	2	3	4	5	6
1. Positive Parenting	-	-.23**	-.11	.04	-.14	-.04
2. Negative Parenting	-	-	.27**	-.07	.10	.15 ⁺
3. Fearful Temperament	-	-	-	-.48**	.17 ⁺	.19*
4. Fearless Temperament	-	-	-	-	-.01	.05
5. Internalizing Behaviors	-	-	-	-	-	.70**
6. Externalizing Behaviors	-	-	-	-	-	-

* $p < .05$, ** $p < .01$, ⁺ $p < .10$

In contrast to expectations, neither positive nor negative parenting were statistically significantly correlated with internalizing or externalizing behaviors, although a trend towards statistical significance emerged for negative parenting and externalizing behaviors. With regard to temperament, again positive parenting was not correlated with either fearful or fearless temperament, but negative parenting was statistically and significantly associated with more fearful temperament but unrelated to fearless temperament. Finally, fearful temperament was statistically and significantly associated with more externalizing behaviors with a similar trend emerging for internalizing behaviors. Fearless temperament was unrelated to either internalizing or externalizing behaviors. The pattern of statistically significant correlations provided only modest support for the study hypotheses. The next step was to empirically evaluate the study hypotheses using partial correlations and regression equations.

Hypothesis 1: Fearful temperament will be positively associated with internalizing behaviors after controlling for externalizing behaviors.

A partial correlation was computed to test hypothesis 1. After controlling for externalizing behaviors, the previously marginally statistically significant correlation between fearful temperament and internalizing behaviors was no longer statistically significant ($r = 0.05$). Although not hypothesized, after controlling for internalizing problems, the previously statistically significant correlation between externalizing temperament and fearful temperament was no longer significant ($r = .10$).

Hypothesis 2: After controlling for internalizing behaviors, the correlation between fearless temperament and externalizing behaviors will be statistically significant.

Once the overlap between internalizing and externalizing behaviors was removed, externalizing behaviors and fearless temperament were expected to be statistically and significantly correlated. Again, a partial correlation was estimated. Controlling for internalizing behaviors did not change the previously nonsignificant correlation between fearless temperament and externalizing behaviors ($r = 0.08$). Although not hypothesized, controlling for externalizing behaviors also did not change the nonsignificant correlation between fearless temperament and internalizing problems ($r = -0.07$).

Hypothesis 3: Variations in parenting quality will interact with variations in children's temperamental fear to influence children's level of internalizing or externalizing behaviors.

Four hierarchical linear regression equations were computed to test hypothesis 3. Prior to computing regression equations, all independent variables were grand mean centered. Next, interaction terms were computed by multiplying the moderator (e.g., positive parenting) and the

main effect (e.g., fearful temperament). Estimating the models proceeded in steps. Controls were entered in the first step of all equations. These controls included problem behavior and parenting. For instance, to control for the covariation and to ensure that models were predicting unique rather than common variance, externalizing problems was entered in the first step of the internalizing problem equations and internalizing problems was entered in the first step of the externalizing equations. In addition, when estimating the impact of positive parenting on internalizing or externalizing problems, negative parenting was statistically controlled in the first step of the equation. This ensured that the equations separately considered the interactive effects of positive or negative parenting with fearful temperament on internalizing behaviors and the interactive effects of positive or negative parenting with fearless temperament on externalizing behaviors. Results will be described first for internalizing behaviors and then for externalizing behaviors.

First, the associations among positive parenting and fearful temperament on internalizing behaviors were estimated (see Table 3, panel A). After controlling for externalizing behaviors and negative parenting in the first step of the equation, the main effects of positive parenting and fearful temperament were estimated. While the beta for fearful temperament was not statistically significant, the beta for positive parenting trended towards significance. The step for the main effects did not explain statistically significant portions of the variance associated with internalizing problems. In the third step of the equation, the positive parenting x fearful temperament interaction term was entered. The beta associated with the interaction term was not statistically significant and no statistically significant change in R-square emerged. To summarize, no evidence emerged that positive parenting interacted with fearful temperament to influence level of internalizing behaviors.

Next, the same hierarchical regression equation was computed, this time considering negative parenting (Table 3, panel b). After statistically controlling for the influence of positive parenting and externalizing behaviors on internalizing behaviors, the main effects of negative parenting and fearful temperament were estimated. Neither of the beta coefficients associated with the main effects was statistically significant. In the final step, the interaction term was entered into the equation. Like the previous regression equation, the beta coefficient associated with the negative parenting x fearful temperament interaction term was not statistically significant and no statistically significant change in R-square emerged. There was no support for the expectation that fearful temperament and negative parenting interact to influence levels of internalizing behaviors.

Table 3. Results of the hierarchical regression equations evaluating the impact of parenting and fearful temperament on levels of internalizing behaviors.

Panel A: Positive Parenting	β	t	ΔR^2
Step 1: Controls			
Externalizing behaviors	0.70**	10.63**	0.50**
Negative parenting	- 0.01	- 0.95	
Step 2: Main effects			
Positive parenting	- 0.11 ⁺	- 1.67 ⁺	0.01
Fearful temperament	0.05	0.65	
Step 3: Interaction term			
Positive parenting x Fearful temperament	0.08	1.09	0.01
Panel B: Negative Parenting	β	t	ΔR^2
Step 1: Controls			
Externalizing behaviors	0.70**	10.76**	0.50**
Positive parenting	- 0.11	- 1.65	
Step 2: Main effects			
Negative parenting	- 0.04	- 0.62	0.00
Fearful temperament	0.06	0.81	
Step 3: Interaction term			
Negative Parenting x Fearful temperament	- 0.04	- 0.53	0.00

Dependent variable: Internalizing behaviors

*p< .05, **p< .01, ⁺p<.10

The third regression equation tested the associations among positive parenting and fearless temperament on externalizing behaviors (see Table 4, panel A). After controlling for internalizing behaviors and negative parenting in the first step of the equation, the main effects of positive parenting and fearless temperament were estimated. Neither of the betas for the main effects was statistically significant and this step did not explain statistically significant portions of the variance associated with externalizing problems. In the third step of the equation, the positive parenting x fearless temperament interaction term was entered. The beta associated with the interaction term was not statistically significant and no statistically significant change in R-square emerged. To summarize, no evidence emerged that positive parenting interacted with fearless temperament to influence level of externalizing behaviors.

The last hierarchical regression equation considered negative parenting and fearless temperament (Table 4, panel b). After statistically controlling for the influence of positive parenting and internalizing behaviors on externalizing behaviors, the main effects of negative parenting and fearless temperament were estimated. Neither of the beta coefficients associated with the main effects was statistically significant. In the final step, the interaction term was entered into the equation. Like the previous regression equation, the beta coefficient associated with the negative parenting x fearless temperament interaction term was not statistically significant and no statistically significant change in R-square emerged. There was no support for the expectation that fearless temperament and negative parenting interact to influence levels of externalizing behaviors.

Table 4. Results of the hierarchical regression equations evaluating the impact of parenting and fearless temperament on levels of externalizing behaviors.

Panel A: Positive Parenting	β	t	ΔR^2
Step 1: Controls			
Internalizing behaviors	0.70**	10.63**	0.50**
Negative parenting	0.08	1.27	
Step 2: Main effects			
Positive parenting	0.07	1.04	0.01
Fearless temperament	0.07	1.02	
Step 3: Interaction term			
Positive parenting x Fearless temperament	- 0.05	- 0.79	0.00
Panel B: Negative Parenting	β	t	ΔR^2
Step 1: Controls			
Internalizing behaviors	0.71**	10.76**	0.50**
Positive parenting	0.05	0.76	
Step 2: Main effects			
Negative parenting	0.10	1.54	0.01
Fearless temperament	0.07	1.02	
Step 3: Interaction term			
Negative Parenting x Fearless temperament	0.01	0.19	0.00

Dependent variable: Externalizing behaviors

* $p < .05$, ** $p < .01$, + $p < .10$

Additionally, although not hypothesized, regression equations were computed for associations between parenting and fearful temperament on externalizing behaviors as a statistically significant association emerged between fearful temperament and externalizing behaviors (Table 2). First, equations testing positive parenting on fearful temperament were estimated. After statistically controlling for the influence of negative parenting and internalizing behaviors on externalizing behaviors, the main effects of positive parenting and fearful temperament were estimated. Neither of the beta coefficients associated with the main effects was statistically significant ($\beta = 0.07$, $\beta = 0.05$). In the final step, the interaction term was entered into the equation. The beta coefficient associated with the positive parenting x fearful temperament interaction term was not statistically significant and no statistically significant

change in R-square emerged. There was no support for the expectation that fearful temperament and positive parenting interact to influence levels of externalizing behaviors.

Next, equations for associations among negative parenting and fearful temperament on externalizing behaviors were computed. After statistically controlling for the influence of positive parenting and internalizing behaviors on externalizing behaviors, the main effects of negative parenting and fearful temperament were estimated. Neither of the beta coefficients associated with the main effects was statistically significant ($\beta = 0.09$, $\beta = 0.05$). In the final step, the interaction term was entered into the equation. The beta coefficient associated with the negative parenting x fearful temperament interaction term was not statistically significant and no statistically significant change in R-square emerged. There was no support for the expectation that fearful temperament and negative parenting would interact to influence levels of externalizing behaviors.

Discussion

Differences in mothers' observed positive and negative parenting were expected to explain variations in the associations among temperamental fear and internalizing or externalizing behaviors. That is, more observed fearful temperament was expected to be associated with higher levels of internalizing behaviors, while more observed fearless temperament was expected to be associated with higher levels of externalizing behaviors. Unfortunately, internalizing behaviors were not statistically and significantly correlated with variations in fearful temperament and externalizing behaviors were not statistically and significantly correlated with fearless temperament. Not surprisingly, parenting quality did not interact with variations in temperamental fear to influence levels of internalizing or externalizing problems. The following sections first considers alternative explanations for the lack of statistical

significance. Next, the strengths and limitations of the study are described. Finally, recommendations for future studies are described.

Parenting quality moderates the association between children's temperamental fear and problem behaviors

Previous research has established associations of fearless temperament to externalizing behaviors and fearful behaviors to internalizing behaviors. While the current study did not demonstrate those linkages, analyses revealed marginally significant associations between fearful temperament and externalizing behaviors, suggesting children's fearful temperament may also contribute to the development of externalizing behaviors, and not only internalizing behaviors, as previously thought. Additionally, while regressions for parenting and fearful temperament on externalizing behaviors were not significant, previous studies have demonstrated that negative parenting and fearful temperament may interact to increase externalizing, but not internalizing, behaviors among preschool-aged children (Colder, Lochman, and Wells, 1997; Morris, Silk, Steinberg, Sessa, Avenevoli, and Essex, 2002). Similar findings were also reported in a study the current study replicated. A previous study conducted by Barnett and Scaramella's Mothers and Preschoolers Study (MAPS; 2015), examined whether children's sex and fear reactivity would moderate the relationship between parenting quality and children's problem behaviors. Unlike the present study, MAPS found that parenting quality and temperamental fear did interact to influence problem behaviors in preschool-aged children. Specifically, Barnett and Scaramella found that lower levels of fearless behavior in boys, but not girls, interacted with increased mothers' supportive parenting to decrease problem behaviors (2015). The current study did not replicate these findings.

However, the lack of statistically significant findings may be accurate due to demographic differences. First, although the study samples for the present study and MAPS were similar in terms of SES/income and race, several differences existed. First, MAPS recruited participants from urban, New Orleans, while the current study recruited participants from the rural, gulf coast of Alabama. Second, MAPS included siblings for within family analyses, in a longitudinal study. Finally, different tasks were used in the previous study. MAPS used only 1 task for each construct, while the current study used 3 tasks for parenting quality and 2 tasks for temperamental fear. Additionally, Barnett and Scaramella used children's fear distress, not avoidant behavior, during the temperament task to create the fearful temperament construct, or fear reactivity. The present study used avoidant and approach behaviors to measure temperamental fear.

Strengths, limitations, and future directions

The current study presented several strengths and limitations. Strengths include the methods used; multiple observational tasks to define parenting and children's temperament. Most importantly, the current sample was structured as a cross-sectional study. While a longitudinal design would be better fitted to monitor the development of temperamental fear and externalizing and internalizing behaviors over time, bidirectional effects within the parent-child relationship must also be considered. Many studies may observe parenting quality and temperamental fear at different points in time, consequently including bidirectional effects. That is, a longitudinal design would make it difficult to attribute associations among variables and not due to children's temperament affecting parenting quality, or parenting quality affecting children's temperament (Ollendick & Ryan, 2018).

However, several limitations also emerged. First, only one measure was used to define the problem behaviors construct, the Child behavior checklist (CBCL). Mothers' completed one questionnaire to report on their children's internalizing and externalizing behaviors. Next, there were methodological concerns. The current study's low variability for parenting and children's temperamental fear may indicate the methods used were not valid for this age range (3-6), or the tasks were not stressful enough. Because the interviews took place in the children's homes, it is possible the tasks were not stressful enough for the children. While some distress was observed in this sample, overall, the temperamental fear tasks did not garner enough distress among child participants. Additionally, low variability in parenting quality indicates the tasks may not have been challenging enough for mothers, or the tasks were not representative of typical mother-child interactions. Due to the low variability, it is possible the study results were accurate for this sample.

Future directions should consider environmental influence; it is possible the rural environment served as a protective factor for this sample. Next steps may include comparing the current study's sample and MAPS's sample for any significant differences on the basis of geographic urbanicity. Because rural communities are less populated than urban communities, there may be less risk for exposure to violence or other stressors that would otherwise influence the mothers' parenting or children's adjustment.

Additional future recommendations include studying the impact of other moderators or how they may influence parenting quality to indirectly impact the association between children's temperamental fear and problem behaviors. Parents' mental health is one such moderators that may disrupt parenting quality, indirectly influencing children's adjustment. Substance use, depression, and anxiety all may influence a parent's ability to serve as resource for their children.

For example, Eiden and colleagues (2007) found that parents who were alcohol-dependent used less positive parenting (e.g., warmth and sensitivity) than compared to parents who were not alcohol-dependent. Similar findings have been reported among parents with depression and anxiety; specifically, more negative parenting was exhibited among mothers with depression or anxiety (Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Additionally, parents' psychopathology can contribute to the development of problem behaviors in children. For example, children of parents with depression exhibit more externalizing behaviors during childhood than compared to children of parents with no reported psychopathology (Eiden, Edwards, & Leonard, 2007). In conclusion, the role of parenting quality and children's temperamental fear on problem behaviors must consider external influences such as parent's mental health, SES, geographic differences, exposure to dangerous neighborhoods, and the bidirectional effects of the parent-child relationship.

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Vita

Tejal Patel is from Loudoun County, Virginia. She received her B.S. in Psychology in 2016 from Virginia Polytechnic Institute and State University. Tejal entered the Applied Developmental Psychology graduate program in 2016 under the supervision of Dr. Laura Scaramella. Tejal's research focuses on psychopathology during early childhood and parenting. As an applied researcher, she is most interested in intervention and prevention program evaluation and the intersection of research and policy.