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Children with higher frustration reactivity are at elevated risk for developing externalizing problems. Prior research has also indicated that certain parenting factors (e.g., hostility, rejection), are associated with risk for child psychopathology while others (e.g., warmth, responsiveness), are associated with positive child outcomes. Responsiveness (i.e., prompt, appropriate response to children's bids/distress) is a feature of authoritative parenting that has been linked to the development of adaptive skills in children. The goal of the present study was to examine the effect of child frustration reactivity (FR) and parental responsiveness (PR) on risk for increase in externalizing symptoms (ES) in a longitudinal design. A sample of 106 boys and 137 girls was assessed at five years of age for ES, FR and PR. They were again assessed at ten years of age for ES. It was hypothesized that higher FR at age five would predict an increase in ES at age ten, and higher PR at age five would be associated a decrease ES at age ten. Further, it was hypothesized that PR would moderate the relation between FR and later ES such that higher PR would mitigate this relation for children higher in FR. As hypothesized, there was a significant main effect found between early PR and later ES. When early ES was included as a covariate there was also a significant main effect between early FR and later ES. Contrary to hypotheses, there was no moderation effect of PR found. However, exploratory analyses revealed a significant interaction effect of PR and FR predicting concurrent ES at age 5. Implications and future research directions are discussed.

THE RELATION BETWEEN EARLY FRUSTRATION REACTIVITY, PARENTAL RESPONSIVENESS AND LATER EXTERNALIZING SYMPTOMS

by

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CHAPTER I

INTRODUCTION

Children's disruptive behaviors or externalizing symptoms (ES) are often the main motivator for seeking mental health treatment, but can be more difficult to treat than other problems (Shaw et al., 1998). Given the relation between ES in childhood (i.e., aggressive, oppositional, and destructive behaviors) and later negative outcomes (e.g., academic, social, occupational, mental health problems), researchers have attempted to better understand etiology and risk factors of ES (Achenbach, Edelbrock, & Howell, 1987; Ryan & Ollendick, 2018). While it is developmentally typical for young children to display some externalizing behaviors (e.g., temper tantrums, poor frustration tolerance, defiance), these usually decline during toddlerhood and by school-age as children experience and learn to cope with challenging situations (Beauchaine, Strassberg, Kees, & Drabick, 2002; Owens & Shaw, 2003; Tremblay, 2000). However, some children may follow a trajectory that places them at risk of developing more severe behavior problems or psychopathology in adolescence and anti-social behavior in adulthood (Broidy et al., 2003).

Researchers have uncovered many individual child characteristics and environmental factors that can increase risk for later externalizing symptoms. These include, a "difficult" child temperament, negative parenting, and certain sociodemographic factors (e.g. sex) (Deater-Deckard, Dodge, Bates, & Pettit, 1998;

Hicks et al., 2007). There are also a number of protective individual and environmental factors such as secure attachment, social support, and positive parenting (Fritz, de Graaff, Caisley, Van Harmelen, & Wilkinson, 2018). Positive parenting has been described in the literature in a multitude of ways including, a combination of parental warmth (i.e., global positive affect) and responsiveness (i.e., positive, prompt, appropriate responses to children's requests or distress) (Davidov & Grusec, 2006). While a multitude of etiological factors for ES have been identified across development (Cicchetti & Toth, 2009), few studies have focused on the specific protective role that parental responsiveness may play for children with more reactive temperaments. A better understanding of the protective role of parental responsiveness may provide important insight and inform early intervention efforts for children at greater risk for externalizing problems. The present study examined the relation between children's early frustration reactivity at a school entry age (age five) and presence of externalizing symptoms in preadolescence (age ten), and whether parental responsiveness would moderate the relation between them.

Externalizing Symptoms

Externalizing symptoms (ES) represent the most common form of childhood maladjustment, and tend to vary in presentation and frequency throughout development (Bongers, Koot, Van Der Ende, & Verhulst, 2004; Campbell, 1995). Additionally, children exhibiting early externalizing symptoms are at elevated risk for developing externalizing disorders such as oppositional defiant disorder (ODD) and conduct disorder (CD) (David, David, & Dobrean, 2014). As such, it is important to ameliorate early child

ES as they put children at risk for adverse outcomes across multiple domains such as dysfunctional family and peer relationships, conduct problems, substance abuse, and academic/occupational difficulties (Deater-Deckard & Dodge, 1997; Joussemet et al., 2008; Masten et al., 2004). Estimates of the childhood prevalence of disruptive behavior disorders such as CD and ODD are about 3.5% and 2.8%, respectively (NRC and IOM, 2009). Additionally, these disorders tend to have a high rate of comorbidity and symptom overlap with mood and anxiety disorders across development.

As with other types of behavioral issues, there are some sex and age differences in prevalence and presentation of ES. For instance, aggression and property violation is reported more often among males (Bongers et al., 2004). Lahey and colleagues (2000) found that certain externalizing behaviors such as opposition, peaked in early childhood, while aggression peaked around 13 years of age. Thus, it is important to study children at a school-entry age as they are entering novel environments, with new peers and adults, and encountering potentially frustrating situations. Consistent with prior research, school age children who have difficulty coping with frustration are at risk for elevated externalizing symptoms in preadolescence. This in turn may put them at increased risk prior to entering adolescence, which is characterized by higher levels of risk-taking behavior and conflict with parents (Arnett, 1999).

Researchers have proposed several theories to explain the interaction of environmental (e.g. parenting) and individual (e.g. temperament) factors to predict children's externalizing symptoms. These include the coercion theory, the diathesis-stress theory, and the differential susceptibility theory (Belsky, 2005; Meehl, 1977; Patterson,

1982; Zuckerman, 1999). The coercion theory describes a cycle where harsh parenting and discipline inadvertently reinforces children's negative behaviors, which then elicits more negative responses (Patterson, 1982). The diathesis-stress model states that children who are more vulnerable (e.g. more reactive) that are exposed to stressful environments (e.g. low responsiveness parenting), will be more negatively impacted (i.e., display more ES) than more resilient children (Slagt, Dubas, Denissen, Deković, & van Aken, 2015; Zuckerman, 1999). The differential susceptibility theory posits that in addition to being more affected by negative outcomes, vulnerable children will benefit more from positive, responsive parenting than less-susceptible children (Belsky, 2005). This theory coincides with Bronfenbrenner's (1994) person-process-context model, which postulates that environmental variables (e.g. parenting) can differ in terms of its impact on children's development based on individual characteristics (e.g., negative emotionality, difficult temperament, physiological reactivity) (Belsky, 2005; Boyce & Ellis, 2005; Del Giudice, 2017). For instance, Lengua, (2008) found that children who were easily frustrated had increased externalizing problems in the context of parental rejection, and decreased externalizing problems with low parental rejection. This pattern was not found for children who were low in frustration reactivity. The present study used the differential susceptibility perspective to examine the potential protective role of the parenting environment on the link between externalizing behaviors and frustration reactivity.

Frustration Reactivity as a Predictor of Externalizing Symptoms

Broadly speaking, frustration is a response to a blocked goal and typically arises around two to three months of age. Frustration reactivity (FR) is the individual's

behavioral activation or arousal to frustration and tends to vary in presentation across development. FR typically increases in early childhood, declines around school entry age, increases again in adolescence, and decreases from late adolescence to adulthood (Deater-Deckard, Wang, Chen, & Bell, 2012; Rothbart & Bates, 2006). Longitudinal research has indicated that higher FR in childhood is a general risk factor for developing externalizing disorders later in life (Calkins, Gill, & Williford, 1999; Ormel et al., 2005). Research with preschoolers by Aksan and colleagues (1999) found that FR at three and a half years of age predicted externalizing symptoms one year later. Similarly, longitudinal research on school age children by Zhou and colleagues (2008) found that children's frustration/anger (parent reported on CBQ- Rothbart, Ahadi, Hershey, & Fisher, 2001) prospectively and uniquely predicted later externalizing symptoms.

Individuals' temperament (e.g. frustration reactivity) also interacts bidirectionally with their environment (e.g. parenting behaviors) to determine outcomes (Lengua, 2006; Rothbart & Posner, 2006). For example, infants with higher FR demonstrate greater behavioral arousal, and parents may respond ineffectively to these children's demands or provide fewer limits/guidance (Calkins & Fox, 1992; Ollendick et al., 1998). Similarly, children with higher FR may react aggressively towards others when aggravated due to their tendency to perceive these provocations as contentious (Vitaro, Brendgen, & Tremblay, 2002). As such, it is important to consider the specific role of parenting in mitigating the relation between early FR and later ES.

Effect of Parenting on Children's Externalizing Symptoms

Although meta-analyses examining children's ES have generally found that parenting has a small effect size, there are a myriad of other factors (e.g. genetic, neurological, social, cognitive) that influence development (Pinquart, 2017; Rothbaum & Weisz, 1994). Parenting factors that have been associated with ES include, inconsistent discipline, harsh parenting, poor monitoring, and negative parenting (Berg-Nielsen, Vikan, & Dahl, 2002; Caron, Weiss, Harris, & Catron, 2006; Ryan & Ollendick, 2018). On the other hand, positive parenting (i.e., warmth, sensitivity, and responsiveness), has been connected to adaptive child outcomes such as lower levels of ES (Boeldt et al., 2012). While warmth describes parents' global positive affect and affection towards their child, parental responsiveness (PR) describes appropriate and supportive responses to children's specific bids and or distress (Davidov & Grusec, 2006).

PR is an essential component of attachment formation and socioemotional development during infancy (Ainsworth, Blehar, Waters, & Wall, 1978). Particularly, responsive, consistent, and sensitive parenting fosters a secure attachment bond (Bowlby, 1988). On the other hand, infants with inconsistent and unresponsive parents may display insecure attachment behaviors such as separation distress and longer distress recovery times (Ainsworth et al., 1978). In sum, parents that are dismissive or hostile towards children's emotions hinder their ability to develop proper emotion-regulation strategies, while parents who are responsive and supportive provide emotional coaching and guidance (Eisenberg & Morris, 2002; Gottman, Guralnick, Wilson, Swanson, & Murray).

Research has indicated that PR throughout early childhood helps to foster positive outcomes such as children's social competence, cognitive development, and conscience formation (Bornstein & Manian, 2013, Bornstein & Tamis-LeMonda, 1989; Kochanska, Aksan, Knaack, & Rhines, 2004; Landry, Smith, & Swank, 2006; Tamis-LeMonda, Bornstein, & Baumwell, 2001; Wakschlag & Hans, 1999). Responsive parents help to ensure that situational demands are developmentally appropriate for children and teach them adaptive ways of coping with frustration (Davidov & Grusec, 2006; De Winter, Waters, Braet, & Bosmans, 2018). Recent research lends support to the association between higher parental supportiveness/responsiveness concurrently during toddlerhood and longitudinally during preschool (Smith & Day, 2018). Research with preschoolers found that maternal responsiveness was associated with lower ES, which was partly due to its positive association with effortful control (Orta, Corapci, Yagmurlu, & Aksan, 2013). Research with school age indicated that parental responsiveness buffered against increases in externalizing behavior two years later, but only for temperamentally "vulnerable" children (e.g., high impulsivity, low effortful control) (Slagt et al., 2015). Thus, responsiveness is an essential element in everyday parent-child interactions which helps to facilitate the formation of children's internal regulation strategies to cope with negative events and emotions (Carlson & Sroufe, 1995; Lohaus, Keller, Ball, Elben, & Voelker, 2001).

It is important to note that while higher responsiveness is beneficial in general, individual children (e.g. those with greater frustration reactivity) may require different levels of responsiveness depending on their needs (Davidov & Grusec, 2006). For

instance, children with higher frustration reactivity who are easily distressed, may require higher responsiveness from parents to appropriately cope with stressful situations. (Crockenberg & Leerkes, 2006; Feldman, Greenbaum, & Yirmiya, 1999; Kochanska, Aksan, & Joy, 2007; Landry, Smith, Miller-Loncar, & Swank, 1997). Conversely, for a child who is better at handling frustrating situations, parental responsiveness may not be as impactful or may actually increase the demands of the situation (Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002). Similarly, children who exhibit more FR, may solicit more maternal negativity and less warmth, which in turn can exacerbate externalizing behaviors (Mullineaux, Deater-Deckard, Petrill, & Thompson, 2009). As such, a "goodness of fit" between child temperament and parenting behaviors help to promote positive outcomes (Chess & Thomas, 2013).

To date, longitudinal work has given some insight into interactions between early child characteristics and parenting variables to predict increased risk for later externalizing symptoms. For example, prior research from the present longitudinal dataset found that frustration reactivity, physiological regulation, and maternal control at age two, differentially predicted membership in four distinct profiles of externalizing behavior at age five (Degnan et al., 2008). Specifically, a high-risk profile was characterized by low emotion regulation and low maternal control. This finding suggests that early individual differences in temperament (i.e. frustration reactivity) have important implications for later psychological adjustment (Degnan et al., 2008).

Researchers have measured parental responsiveness in a number of ways including, self-report questionnaires and observational coding during home or laboratory

visits. In order to reduce self-report bias, and in line with more recent research (add cites), the present study utilized an observational coding system to measure PR across several parent-child interaction laboratory tasks. Examining parental responsiveness may be particularly unique because it provides specific insight as to how parents respond to their children's distress and requests above and beyond global positive affection.

Sociodemographic Considerations

When examining the protective role of parenting variables, it is important to consider how cultural differences may function differently across groups (Coll, Akerman, & Cicchetti, 2000; McLoyd & Steinberg, 1998). Notably, many parenting constructs and observational behavior codes were originally defined in early studies with primarily White families (Spencer & Markstrom-Adams, 1990). Consequently, they may not be capturing racially unique parent-child communication differences, such as differences in what may be considered "responsive" parenting (Canino & Guarnaccia, 1997; Gonzales & Hiraga, 1998). Therefore, parental responsiveness may differentially predict outcomes among various cultural groups (Deater-Deckard & Dodge, 1997; Eisenberg, Fabes, Bernzweig et al., 1993). Along the same lines, there are differences in prevalence and externalizing symptoms across racial/ethnic groups (McLaughlin, Hilt, & Nolen-Hoeksema, 2007).

Along with cultural differences, sex differences in study variables (e.g., ES) must also be considered. As detailed previously, males have higher reported levels of externalizing symptoms, specifically, physical aggression and antisocial behavior (Canter, 1982; Hicks, Blongigen, Krueger, Patrick, Iacono & McGue, 2008; Huselid &

Cooper, 1994; Newman, Moffitt, Caspi, Silva, Stanton, 1996). In order to help address this prevalence difference, the present study utilized gender-normed ES t-scores.

In summary, prior research has indicated the value of understanding risk and protective etiological factors of ES, including the role of individual child temperamental characteristics and environmental factors such as parental responsiveness. However, some questions still remain. The present study aimed to extend the current literature in three ways. First, it utilized a longitudinal design to study how these parental responsiveness and frustration from a school entry age into preadolescence. The only past longitudinal research examining this question focused on early childhood (Degnan et al., 2008) and school entry ages (Slagt et al., 2015). Second, the observational measure of FR also included latency/quickness to respond and global response intensity to better capture differences in components of children's individual responses (Zander, 1944). Third, it focused on a more specific positive parenting variable, responsiveness, using an average of observational codes across six different mother-child laboratory tasks. A better of understanding of the potential protective role of parental responsiveness on the relation between children's early frustration reactivity and children's increases in later externalizing symptoms may help to identify children at-risk. This may help guide interventions prior to the "storm (decreased self-control) and stress (increased sensitivity)" of adolescence, which is characterized by conflict with parents, mood disruption, risky behavior (Arnett, 1999; Hall, 1904). Therefore, the present study specifically examined potential interaction effects of parental responsiveness and

children's frustration reactivity at a school-entry to age predict changes in externalizing symptoms in preadolescence.

Goals and Hypotheses

The goal of the present study was to better understand the relation between children's early frustration reactivity, parental responsiveness, and later externalizing symptoms as well as to examine if responsiveness may serve as a protective factor for children at higher risk (i.e., higher FR) for later ES. First, it was hypothesized that higher parental responsiveness would predict lower externalizing symptoms at age ten. It was further hypothesized that higher frustration reactivity at age five would predict higher externalizing symptoms at age ten. A moderation hypothesis posited that parental responsiveness would moderate the relation between frustration reactivity and externalizing symptoms, such that higher parental responsiveness would mitigate the relation between frustration reactivity and externalizing symptoms for children higher in FR (see Figure 1).

CHAPTER II

METHOD

Participants

The present study utilized data from three cohorts of children who were part of a longitudinal study of social and emotional development (RIGHT Track study). The recruitment goal was to obtain a sample of children who were at risk for developing future externalizing behavior problems, and who were representative of the surrounding community in terms of race and socioeconomic status (SES). All three cohorts were recruited through the County Health Department, child day care centers, and the local Women, Infants, and Children (WIC) program.

For Cohort 1, 474 were screened and 154 children were selected. Of these, 44 of the children had externalizing scores on the CBCL in the clinical or borderline clinical range (t-scores of 60 or above), and 27 of the children had both externalizing and internalizing scores above the clinical or borderline clinical range. Children were classified as being at risk for future externalizing behaviors if they received an externalizing T-score of 60 or above. Selection efforts were based on having a racially and economically diverse cohort (65% European American; mean Hollingshead score = 39.2), primarily from intact families (77%), with about equal numbers of girls (n=76) and boys (n=78).

When recruiting for Cohort 2, 492 children were screened and 153 children were selected for participation. Of these, 48 children had externalizing scores on the CBCL in the clinical or borderline clinical range, and 24 of the children had both externalizing and internalizing scores above the clinical or borderline clinical range. As with cohort 1, this final group of children (71 boys, 82 girls) was racially and economically diverse (68% European American; mean Hollingshead score = 39.7), primarily from intact families (84%).

Recruitment for Cohort 3 came from a different longitudinal study, which began when the children were six-months-old. At six-months of age, 346 infants were screened for their level of frustration based on parent responses to a subscale of a temperament questionnaire (Distress to Limits; Infant Behavior Questionnaire [IBQ], Rothbart, 1981) and infant responses during two frustration-eliciting laboratory tasks (Barrier Task and Arm Restraint; LAB-TAB, Goldsmith & Rothbart, 1993). From this group, 162 infants were selected based on IBQ data and the laboratory assessment (Calkins, Dedmon, Gill, Lomax, & Johnson, 2002). Of the selected sample, 85 infants scored at or above the 50th percentile on both the laboratory index of frustration and maternal report of distress to limits (easily frustrated group). Of the 140 children in cohort 3 who completed the CBCL, 11 of these children had externalizing scores in the clinical or borderline clinical range (t-score of 60 or above), Ten of the children had both externalizing and internalizing scores above the clinical or borderline clinical range. Similar to cohort 1 and 2, children from cohort 3 were racially and economically diverse (71% European

American; mean Hollingshead score = 38.7), primarily from intact families (79%) and contained 74 girls and 66 boys.

Of the 447 originally selected participants, six were dropped because they did not participate in any data collection at two years old. An additional 12 families participated at recruitment, did not participate at two-year assessments, but did participate at later years. At age five, 365 families participated. There were no significant differences between families who did and did not participate in terms of sex, χ^2 (1, N = 447) = .76, p = .38, race, χ^2 (1, N = 447) = .14, p = .71, 2-year SES, t (432) = -1.93, p = .06, and 2-year externalizing T score, t (445) = 1.39, p = .17. At age 10, 355 families participated. Again, there were no significant differences between families who did and did not participate in terms of participate in the 10-year assessment in terms of child sex, $\chi 2$ (1, N = 447) = 3.31, p = .07; race, $\chi 2$ (3, N = 447) = 3.12, p = .08; 2-year SES, t (432) = .02, p = .98; or 2-year externalizing T score, t (445) = -.11, p = .91.

The sample for the present study included 243 children (106 males, 61% European American, 23.5% African American, 2.9% Mixed, 1.8% Other). The sample included those who participated in the RIGHT Track project at five and ten-year assessments and had complete data on measures of interest at both of these time points.

Procedure

At the five and ten-year assessments, participants completed a series of laboratory tasks (e.g., computerized tasks, IQ and achievement measures, parent-child interaction tasks), along with measures of ERP and heart rate. Various questionnaires were also completed, assessing family history, parental and family functioning, health information

and children's behavior at each visit. Families gave permission for the project administrator to contact schools to administer questionnaires to teachers, and to acquire transcripts and standardized test results from participants.

For the present study, laboratory measures of frustration reactivity and parental responsiveness from observational coded data, as well as a parent questionnaire of children's symptoms were utilized. To ensure interrater reliability for both observational measures (FR & PR), two trained graduate student researchers students coded approximately 20% of the same tapes separately, and all adjusted kappas were above .70.

Measures

Frustration Reactivity. The predictor variable of frustration reactivity was measured by the "I'm Not Sharing" observational lab paradigm (Goldsmith & Rothbart, 1993), during the five-year visit. In this task, the experimenter tells the child that a friend will be bring in a surprise and then a second experimenter arrives with a candy bowl and two empty containers and informs the child that the candy is to be shared equally. The first experimenter slowly divides the candy unequally, giving themselves more. Eventually, the first experimenter takes all of the candy and asks the child what they think about that. After a pause, the first experimenter decides to be fair and should not eat all of the candy and the child and first experimenter each take two pieces of candy. Length of time for this task within this study sample ranged from 83 seconds to 239 seconds.

Two independent coders rated the global frustration intensity (on a scale of 1 to 4, from no response to extreme frustration), assessed the latency to frustration (time to first

show distress in seconds) and measured the duration of a frustration response (start to end of response, if applicable). Reliabilities were .80 for global frustration, .99 for total task time, .86 for latency, and .90 for duration of frustration. These various frustration measures were correlated (See Table 1) and combined to create a unique composite measure of frustration reactivity. First, all study variables were centered. Then, proportion of time frustrated was calculated by dividing frustration duration by total task time to account for the range in task times. Next, latency of frustration response was reversed, and for children who had no response, their latency was entered as their full task time to avoid confusion from having a latency of 0 seconds which could be misinterpreted as an immediate response instead of no frustration response. Then latency (reversed), proportion frustrated, and global frustration were standardized and added together to create a composite sum score, as the study measure of frustration reactivity at age five.

Parental Responsiveness. This moderator variable was measured using six mother-child observational laboratory tasks (free play, pretend play, craft, cleanup, an easy puzzle, and a hard puzzle) which ranged in length from approximately two to seven minutes. In these tasks, two independent coders assessed global parental responsiveness, defined as how positively, promptly and appropriately the parent responded to the child's bids (weighted kappa = .72). This ranged on a scale from one to four, from minimally, somewhat, moderately, to highly responsive. Highly responsive parents were very responsive to child's bids, and promptly responded to the child's bids and provided

elaborate, sensitive responses. For the present study, an average of global parental responsiveness across all six parent-child interaction tasks was utilized.

Externalizing Symptoms. Measures of externalizing symptoms were obtained using the parent report of the Child Behavior Checklist (CBCL- Achenbach, 1991; Achenbach & Rescorla, 2001). This subscale utilized gender normed externalizing t-scores in order to allow for controlling for earlier externalizing symptoms across versions and account for sex differences in prevalence (5 years and under, 6 to 18 years of age).

CHAPTER III

RESULTS

Various preliminary analyses including correlations (Table 2) were computed for all study variables. Descriptives were computed to assess for normality and skewness (see Table 3 for more information). Potential group differences across study variables (ES, FR, PR) were also assessed using independent samples t-tests or ANOVAs. Independent samples t-test revealed a significant SES differences between White and African American families (F =4.80, p = .003*)*, with SES higher for White families (mean = 45.41) than African American families (mean = 42.05). There was no significant correlation between sex and race (χ^2 (3, N = 243) = .76, p = .16). Consistent with prior research, racial differences on parental responsiveness between White and African American families (*df = 228, t* = 5.62, p < .001) were found such that the mean PR was lower for African American families (mean = 2.64 vs 3.10). Since no differences in PR were found with sex and SES, only race was included as a covariate in analyses. Additionally, there was a significant correlation (r = .67, p < .01) between ES at ages five and ten, and to assess change in ES, ES at age five was also included as a covariate.

A hierarchical linear regression analysis with three steps was completed using SPSS (IBM Corp, 2012), see Table 4 for additional information on beta coefficients. Continuous variables were centered prior to conducting the regression analysis (Myers & Myers, 1990). In Step 1, results indicated that as expected, early ES accounted for 45% of

the variance in increases in later ES (β = .67, p < .001). In Step 2, testing the main effects of PR and FR on later ES, PR accounted for an additional 2% of the variance in increases in later ES with early PR uniquely predicted increases in later ES over and above early ES and race (β = -.14, p = .004), indicating that children with higher parental responsiveness had lower externalizing symptoms later. In Step 3, the interaction of PR was examined. Contrary to the main study hypotheses, that the two-way interaction did not significantly predict increases in later ES over and above other predictors (β = *.03, p* = .492).

Post-hoc Analyses

Post-hoc analyses revealed that when ES was included as a covariate there was not a significant main effect for early FR predicting later increases in ES (β = .08, p = .073). However, without including early ES as a covariate, there was a significant main effect found for both FR (β = .173, p = .007) and PR (β = -.133, p = .043) predicting later ES (see Table 5). Post-hoc analyses were conducted to explore the cross-sectional links between the study variables at age five (see Table 6). Regression analyses indicated that, after controlling for race, there was a significant main effect for frustration reactivity (β = .167, p = .009) on predicting concurrent five-year ES. Additionally, there was a significant interaction between frustration reactivity and parental responsiveness predicting concurrent externalizing symptoms (β = -.14, p = .036). When probed using the guidelines developed by Aiken and West (1991), the differences in slopes were significant at low levels (one standard deviation below the mean) of parental responsiveness (β = .290, p = .001). This means that only children who were higher in FR

(not low) and had less responsive parents, had higher levels of ES, that is lower PR is associated with higher levels of ES for children with higher FR. For additional information, refer to Figure 2.

Due to prior research (e.g., Gonzales & Hiraga, 1998) and statistically significant differences on parental responsiveness by race, separate post-hoc analyses were run for White and African American families (See Tables 7 & 8). Based on research indicating differences in ES across racial groups (McLaughlin, Hilt & Nolen-Hoeksema, 2007) exploratory analyses with early ES as a covariate predicting later ES were run by race. For White families, there was a significant main effect for parental responsiveness (β = -.16, p = .006) but not for frustration reactivity (β = .11, p = .053). No main effects of PR and FR were found for African American families (β = -.17, p = .084; β = .035, p = .738). No significant interaction effect was found for either the White or African American subsamples when run separately (β = -.02, p = .78; β = .10, p = .388).

CHAPTER IV

DISCUSSION

Prior research has indicated the value of studying individual child and parenting variables to help understand children's behavior problems. Specifically, understanding environmental contexts help to uncover those that may increase risk for adverse outcomes as well as those that can promote positive outcomes. Understanding etiology may help inform targeted parenting interventions for children who may be at elevated risk (e.g., Triple P-Positive Parenting Program; Sanders, 1999). This is the first multimethod, longitudinal study from school age to preadolescence to examine the potential protective role of a component of positive parenting (responsiveness), on children who are temperamentally at risk (higher frustration reactivity) for later externalizing symptoms in preadolescence. There were three study goals, to examine main effects of both PR and FR at a school entry age predicting later ES, and the interaction effect of PR on the established relation between early FR and later ES.

As hypothesized, there was a significant main effect found for early PR and later ES. This is consistent with literature indicating the link between positive parenting and decreased ES risk (e.g., Boeldt et al., 2012; Pinquart, 2017). It is also consistent with findings that PR buffered against ES two years later for school-age children who were temperamentally "risk" (i.e., low effortful control, high impulsivity) (Slagt et al., 2015). Thus, it is likely that parents who are responsive help to provide emotional guidance,

which may be a particularly "good fit" for children who are temperamentally predisposed to be more reactive (Eisenberg & Morris, 2002).

Although the hypothesis that early FR would predict later levels of ES was not confirmed, post-hoc analyses revealed a main effect for FR when early ES was not included as a covariate. One possible explanation is the overlap of symptoms of ES (aggressive, oppositional behaviors) and FR (behavioral arousal to frustration), particularly in early development and is consistent with correlations of FR and ES in the dataset. Another possible explanation is that it is difficult to predict ES from FR over five years, as there are many other developmental and environmental factors (i.e., peers).

Contrary to hypotheses, PR did not moderate the relation between early FR and later ES. This is inconsistent with findings by Slagt and colleagues (2015) where responsiveness predicted decreases in ES during middle childhood for children who were temperamentally vulnerable. However, these researchers were examining other temperamental traits (impulsivity and effortful control), over a shorter time frame (2 years), and did not control for early ES. Post-hoc analyses revealed a protective interaction effect of PR present concurrently at age 5. It is likely that associations between parenting and children's ES would be more pronounced when there are "fewer competing socialization agents" such as peers and teachers (Pinquart, 2017) over a shorter timeframe. This is supported by research by Kochanska & Kim (2013) who found that responsiveness buffered against later ES for children (from ages 30 months to 40 months) who were more temperamentally difficult (higher anger proneness and poor effortful control).

Based on prior literature and significant group differences in PR, additional exploratory analyses by race were completed. While there was no significant interaction found, there was a significant main effect of PR for White families only. This finding is consistent with past literature that in minority families, PR may be measured and function differently in terms of predicting child outcomes (Gonzales & Hiraga, 1998; Spencer & Markstrom-Adams, 1990). For instance, research by Deater-Deckard and colleagues (1998) found that low PR at age 5 was associated with higher teacher-reported ES at age 10 for White participants only.

In sum, while significant main effects were found for PR and for FR (without early ES as a covariate), contrary to hypotheses, there was no significant interaction of PR found. A possible explanation is that it is not possible to predict ES from a single child and parent variable over a five year span as there are numerous other individual, biological, and environmental factors. Exploratory analyses did reveal a significant interaction at age 5 such that higher PR buffered against risk for concurrent ES for children who were higher in FR. This study adds to the current literature that highlights the importance of parental responsiveness, particularly for children who are temperamentally predisposed to be more reactive to frustration. This knowledge can help inform targeted parenting-based interventions for young children to ameliorate ES risk early and promote more positive outcomes.

Limitations and Future Directions

This study was not without limitations. First, it focused on examining children at a school-entry age predicting to preadolescence. Future researchers could examine other

potential moderators over a shorter timeframe and over different stages of development. Second, although behavioral codes are less prone to self-report bias, individuals are aware they are being observed in a lab, and their behaviors may not be generalizable to real life patterns. Future research should include home and school observations to increase validity. Third, it is possible that a protective effect of PR would be more evident in a clinical sample, which is another avenue for future research. Fourth, the present study focused on ES only, the literature suggests that early ES is also associated with later internalizing symptoms (IS). Future studies could expand the model to predict later IS. Lastly, only parental not child responsiveness was included, future research could consider the bi-directionality of responsiveness within parent-child interactions. In conclusion, consistent with prior research, the present study found that PR predicted later ES and was a protective buffer against concurrent ES for children who were higher in FR. While the hypothesized interaction was not found longitudinally, findings confirmed the concurrent importance of PR for children who are temperamentally vulnerable to ES. In terms of clinical implications, findings shed light on the importance of identifying and addressing early behavioral issues through interventions aimed at promoting positive parenting practices.

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APPENDIX A

TABLES AND FIGURES

Table 1

Correlations Between Frustration Variables

	FR Composite	FR Latency	FR Global	FR Proportion
FR Composite	1	-	-	-
FR Latency	.842**	1	-	-
FR Global	.956**	-.725**	1	-
FR Proportion	.872**	-.512**	.830**	1

Note. *$p < .05$, **$p < .01$

Table 2

Correlations Between Study Variables

	ES T-Score (5 yr.)	ES T-Score (10 yr.)	Frustration Reactivity	Parental Responsiveness
ES T-Score (5 yr.)	1	-		-
ES T-Score (10 yr.)	.669**	1		-
Frustration Reactivity	.167**	.173**	1	-
Parental Responsiveness	.011	-.131*	.001	1

Note. *$p < .05$, **$p < .01$

Table 3

Descriptives Statistics of Study Variables

	N	Min	Max	Mean	Std. Deviation	Skewness	Kurtosis
Sex	243	1	2	1.56	.50	-.26	-1.95
Race	243	1	4	1.39	.66	1.88	3.82
SES	243	14.00	66.00	44.03	10.44	-.40	-.29
ES T-Score (5 yr.)	243	30.00	79.00	51.21	10.53	.201	-.29
ES T-Score (10 yr.)	243	32.00	77.00	48.59	10.31	.366	-.44
FR	243	-5.46	7.63	.00	2.61	.262	-.38
PR	243	1.60	4.00	2.97	.59	-.02	-.61

Table 4

Effect of PR, FR, and Interaction of the Two on Ten-Year ES, Controlling for Race and Early ES

		β	R2	ΔR2
Step 1:	Race	.04		
	ES (5 yr.)	.67**	.45***	
Step 2:	PR	-.14**		
	FR	.07	.47	.02**
Step 3:	PR X FR	.03	.47	.001

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

Table 5

Exploratory Examination of the Effect of PR, FR and the Interaction of the Two Controlling for Race

		β	R2	ΔR2
Step 1:	Race	.02	.001	
Step 2:	PR	-.13*		
	FR	.17**	.05	.05**
Step 3:	PR X FR	-.06	.05	.003

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

Table 6

Effect of Concurrent PR, FR and the Interaction of the Two on Five-Year-ES Controlling for Race

		β	R2	ΔR2
Step 1:	Race	-.01	.00	
Step 2:	PR	.01		
	FR	.17**	.03	.03*
Step 3:	PR X FR	-.14*	.05	.02*

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

Table 7

Effect of PR. FR, and Interaction of the Two on Ten-Year ES, Controlling for Early ES for White Families

		β	R2	ΔR2
Step 1:	5 yr ES	.67***	.45***	
Step 2:	PR	-.16**		
	FR	.11	.48	.03**
Step 3:	PR X FR	-.02	.48	.00

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

.

Table 8

Effect of PR, FR, and Interaction of the Two on Ten-Year ES, Controlling for Early ES for African American Families.

		β	R2	ΔR2
Step 1:	5 yr ES	.64***	.41***	
Step 2:	PR	-.17		
	FR	.04	.44	.03
Step 3:	PR X FR	-.02	.45	.01

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

Figure 1

Moderation Model

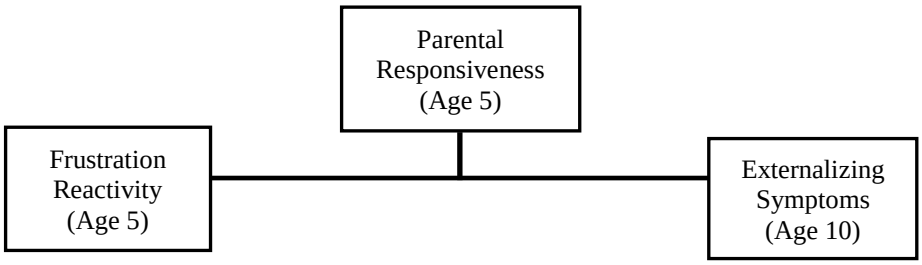
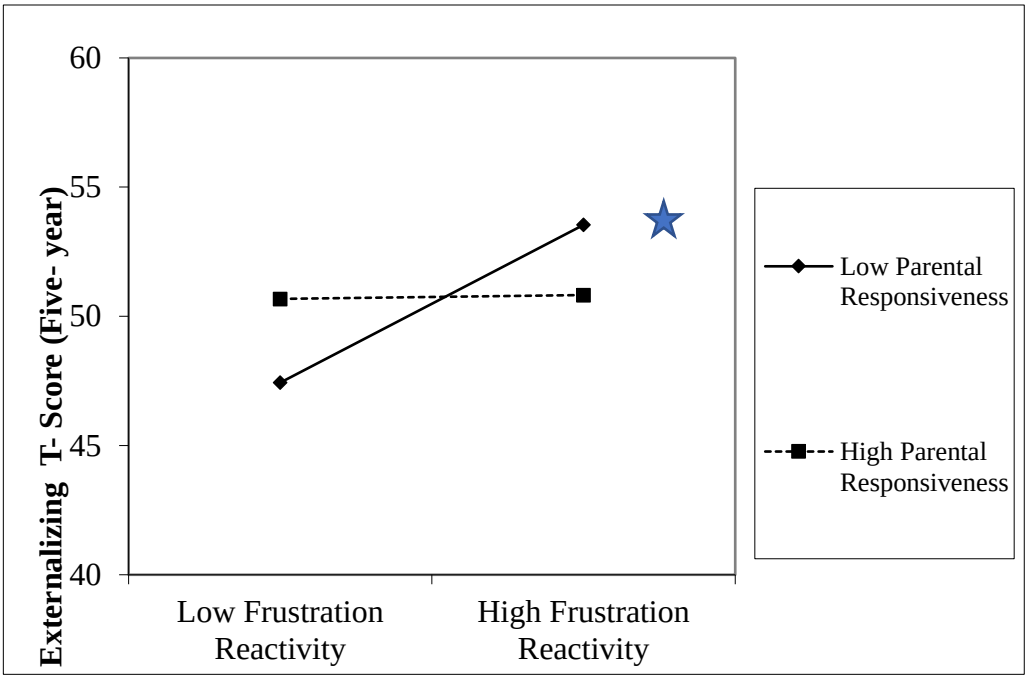


Figure 2

Interaction of PR, FR on ES at Age 5



APPENDIX B

MEASURES

Task Description for the I'm Not Sharing Task:

The experimenter informs the child that a friend will be bring in a surprise. A second experimenter then arrives with a candy bowl and two empty containers and explains to the child that the candy is to be shared equally. The first experiment then gradually divides the candy unequally, placing more candy in his/ her pile compared to the child's pile. Eventually, the experimenter takes all of the child's candy and asks the child what he/ she thinks about that. Following a pause, the experimenter decides that he/ she is being unfair and should not eat all of the candy. Both the child and experimenter take two pieces of candy and return the rest to the seconder experimenter. Start Time: Begins when the experimenter first divides the candy unequally. End Time: Ends when the experimenter says "I'm not being very fair" or the experimenter has clearly ended the task.

Start Time: Begins when the experimenter first divides the candy unequally.

End Time: Ends when the experimenter says "I'm not being very fair" or the experimenter has clearly ended the task.

Latency to Distress/Frustration: The time it takes the child to show the first sign of distress after the experimenter divides the candy unequally (even if mild in intensity- sigh, frown, grimace, or verbal comment). Count as frustration even if the child has a smile on their face and makes a negative verbal comment or shakes their head, etc.

Frustration also includes the child getting out of their chair to physically take the candy from the experimenter, or grabbing the candy from the experimenter.

Duration of Frustration/Distress: The total amount of time during the task that the child shows any frustration.

Frustration Response: During the entire episode during which the candy is divided unequally, the child responds with:

0: No Frustration, or positive response—the child does not show any signs of frustration.

1: Mild Frustration—the child shows one or more signs of frustration that is brief in duration (1-2 seconds) but quickly returns to a neutral state.

2: Mild to Moderate Frustration—the child shows mild frustration initially, increasing to moderate frustration over time.

3: Moderate Frustration—the child shows moderate frustration that increases over time. The child may argue, raise voice, handle candy container roughly, show increased signs of physical agitation, increased frequency and intensity of negative verbal comments.

4: Extreme Frustration—the child shows frustration that clearly escalates to anger. Once child reaches the point, s/he shows little alleviation in intensity of frustration. Physical signs of anger/frustration are present: throwing candy container, kicking, tantruming. Frequent and intense verbal indicators of anger/frustration: crying, yelling.

***Frustration Facial Expression Definition:** Brows down straight or slanting down towards the center. Brows are often drawn together. May be bulges or wrinkled around brows. Cheeks should be raised. Mouth could be straight, angular, or drawn tightly shut.

Parent-child Interaction Task Descriptions:

Task Description for Freeplay: The experimenter brings in several toys and the mom is instructed to play with her child as she normally would at home. After 5 minutes, there is a knock which indicates that it is time to clean up as they normally would at home. Task Duration: 5 minutes

Task Description for Pretend play: Experimenter gets fantasy/ pretend toys for mom and child and instructs mom to play with her child as she normally would at home. The experimenter then informs mom that after 6 minutes he/she will return and join the child in play while the mom completes another task. Task Duration: 6 minutes

Task Description for Craft: Experimenter gives mother and child supplies to work on a craft project together.

Task Description for Cleanup: When the experimenter knocks, the mom is instructed to clean up the toys as her and her child would at home.

Task Description for Puzzle: The experimenter instructs the mom to help her child as much as she thinks he/she needs to be helped. Experimenter brings all puzzles with pieces already taken out if the puzzle into the room in a container. He/she asks the child to complete the first puzzle (animal) and gives mom her instructions. The experimenter times for 2 minutes, or until the child finishes the puzzle, then gives the child the next puzzle (shape). The experimenter then times again for 2 minutes, or until the child

finishes that puzzle, then gives the child the hardest puzzle (caterpillar). He/she times for 2 minutes, or until the child finishes the puzzle. The experimenter does not interact with the mother or child, except for asking child to complete the next puzzle.

Behavioral Coding for Parental Responsiveness

Overall, how sensitive and responsive was the parent to the child? (Responsiveness is defined as the mother promptly and appropriately responding to the child's bids to her.)

1. *minimally* (parent was highly unresponsive or inappropriate, failed to react to child's bids, parent basically ignored child's bids)
2. *somewhat* (parent responded to child but only with brief one-word answers that were not overly sensitive or appropriate)
3. *moderately* (parent inconsistently responded to child, or some responses were brief one-word answers and some responses were more elaborate and sensitive; parent was highly responsive as much as the parent was minimally responsive)
4. *responsive* (parent was highly responsive to child's bids, parent promptly responded to the child's bids and provided elaborate, sensitive responses)