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The Association of Parental Depressive Symptoms and Child Anxiety Symptoms: the Role of Specific Parenting Behaviors

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THE ASSOCIATION OF PARENTAL DEPRESSIVE SYMPTOMS AND CHILD ANXIETY SYMPTOMS:

THE ROLE OF SPECIFIC PARENTING BEHAVIORS

A Dissertation Presented

by

Christina J. M. Colletti, M.S.

to

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of

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Specializing in Psychology

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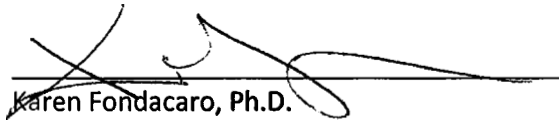
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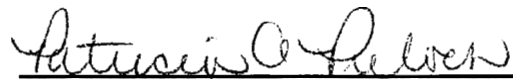
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Abstract

A substantial literature indicates that children and adolescents living with a depressed caregiver are at increased risk for emotional and behavioral problems. Although parental depression has been shown to have non-specific associations across child problems, researchers have begun to examine whether specific risk factors, such as parental depression, are associated with specific child outcomes, such as child anxiety. Parenting behavior has been identified as one potential mechanism for the transmission of depression and other psychopathology from parent to child. The extant literature supports this mechanism, as the parenting behaviors of mothers with and without a history of depression have been found to differ in important ways. Moreover, two separate literatures suggest that the same parenting behaviors are associated with both parental depression and child anxiety.

The current study was designed to extend past research in the areas of parental depression, parenting, and child anxiety by examining parenting behavior as an explanatory mechanism for the association of parental depressive symptoms and child anxiety symptoms. Using a sample of parents with a history of depression and their 9- to 15-year-old children, the current study examined four specific parenting behaviors (i.e., hostility, intrusiveness, withdrawal, and warmth), observed in the context of a stressful parent-child interaction task, as mediators of the association between parental depressive symptoms and both parent and child reports of child anxiety symptoms.

Limited support was found for the meditational role of specific parenting behaviors in the association of parental depressive symptoms and child anxiety symptoms. Linear mixed-model analyses revealed an inverse and likely spurious relation between parental depressive symptoms and parent report of child anxiety symptoms. A significant positive association also emerged between parental depressive symptoms and observed parental withdrawal. No support was found for the other relations of the proposed mediation model. Possible reasons for the lack of significant findings are discussed.

Acknowledgements

I could not have completed this dissertation without the mentorship of Rex Forehand. Thank you, Rex, for your patience, commitment, knowledge, and wonderful ability to provide the same structure and positive reinforcement that we teach the families in the Raising Healthy Children program. My entire experience in the Psychology Department at the University of Vermont has been a positive one, and I am grateful to you for the opportunity to complete my doctoral degree here.

I could not have completed this dissertation without the rest of my dissertation committee members, Keith Burt, Karen Fondacaro, Patty Prelock, and Tim Stickle. Thank you for your support throughout this process and your obvious desire to help me succeed. Special thanks to Keith, Tim, and Alan Howard for your willingness to share your statistical expertise.

I could not have completed this dissertation without the Raising Healthy Children team, whose members have devoted immeasurable amounts of time and energy into seeing the project to completion. I could not imagine a more cohesive or supportive team with which to prevent depression in children and families.

I would not have completed this dissertation, or likely even attended graduate school in psychology, had my interest in working with children and families not been sparked by taking care of Meaghan, Patrick, Katie, and Connor McFadden for a decade. Thank you, McFadden Family, for the opportunity to be a part of your lives.

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CHAPTER 1: INTRODUCTION

1.1. Review of the Extant Literature

1.1.1. Depression background

Major depressive disorder (MDD) represents a significant public health concern. The disorder is estimated to impact nearly one in five people in the United States during their lifetime (Kessler et al., 2003) and is one of the leading causes of disease-related disability worldwide (Murray & Lopez, 1997). National Comorbidity Study – Replication (NCS-R; Kessler et al., 2003) data indicate that the cumulative lifetime and 12-month prevalence rates for MDD from 2001 to 2002 were 16.2% and 6.6%, respectively, based on the criteria set forth in the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV; American Psychiatric Association, 1994). The National Epidemiologic Survey of Alcoholism and Related Conditions (NESARC; Hasin, Goodwin, Stinson, & Grant, 2005) provided similar lifetime (13.2%) and 12-month (5.3%) prevalence estimates. Based on these estimates, approximately 32 to 35 million adults are projected to be impacted by depression during their lifetime (Kessler et al., 2003).

Longitudinal studies examining the course of MDD indicate that the disorder is highly recurrent, with approximately 75% to 85% of individuals experiencing more than one episode in their lifetime; the median number of episodes across all individuals with a history of depression is seven (Belsher & Costello, 1988; Boland & Keller, 2002). The average duration of major depressive episodes appears to be relatively short. Epidemiological data indicate median and mean recovery times of approximately six and twelve weeks, respectively (Kendler, Walters, & Kessler, 1997). Despite the short duration of episodes, residual depressive symptoms have been shown to persist following remission from a depressive episode in as many as one-third of individuals (Kennedy, Abbott, & Paykel, 2003; Paykel, 1998).

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Prevalence rates for MDD have been shown to vary by gender, marital status, socioeconomic status, age, and birth cohort. Specifically, prevalence rates are 1.7 to 2 times higher in women than in men (Hasin et al., 2005; Kessler et al., 2003), putting women at approximately twice the risk for developing the disorder during their lifetime. Epidemiological data indicate that being Native American, widowed, separated or divorced, never married, unemployed or disabled, less educated, or in the lowest national income bracket also increases depression risk (Hasin et al., 2005; Kessler et al., 2003). Kessler et al. (2003) examined age of onset and found that depression risk is fairly low until early adolescence, when it begins to rise in a roughly linear fashion. Moreover, Kessler et al. identified a pattern of increasingly steep slope for more recent age cohorts. For example, whereas the cumulative lifetime prevalence rate for individuals over 60 years of age at the time of the study approached 15%, the same rate for individuals between 18 and 29 years of age approached 25%. These data suggest that depression rates are higher in younger generations.

1.1.2. Impact of parental depression on children

Studies from the last few decades indicate that children and adolescents living with a depressed caregiver are at increased risk for a wide range of emotional and behavioral problems. In an early review, Beardslee and colleagues found increased prevalence rates ranging from 40% to 45% for current and lifetime psychiatric diagnoses in offspring of parents with an affective disorder (Beardslee, Bemporad, Keller, & Klerman, 1983). More recent reviews of studies that included control groups have confirmed this increased risk and suggest that children and adolescents who have a parent with depression are three times more likely to qualify for any affective disorder, six times more likely to be diagnosed with major depression,

specifically (Downey & Coyne, 1990), and two to five times more likely to be diagnosed with an externalizing disorder (Cummings & Davies, 1994) than comparison children and adolescents.

One way to organize the existing literature on parent depression and offspring outcomes is by age of the offspring. Studies have typically examined outcomes among infants, preschool-age children, and school-age children and adolescents. As infants, offspring of parents with depression exhibit differences in emotional, behavioral, and physiological functioning relative to offspring of parents without depression. Offspring of depressed caregivers suffer from higher rates of perinatal complications and receive higher scores on perinatal stress measures (Beardslee et al., 1983). Neonates show signs of difficult temperaments, typified by poor orienting skills, low responsiveness and activity levels, negative emotion, irritability, and hypersensitivity (Abrams, Field, Scafidi, & Prodromidis, 1995; Cummings & Davies, 1994). Infants whose mothers are depressed have also been shown to vocalize less frequently, avert their gaze and protest more frequently, and show fewer positive and more negative facial expressions in mother-child interactions compared with infants whose mothers are not depressed (Field, 1995). Negative effects of unresponsive maternal behavior have been noted even during very brief interactions staged between mothers without depression and their infants, during which flat facial expressions by mothers have preceded disorganized and distressed infant behaviors such as looking wary, gaze averting, and protesting (Field, 1995).

Several studies have demonstrated that preschool-age offspring of caregivers with current or previous depression exhibit higher levels of both internalizing and externalizing problems than do preschoolers whose caregivers do not have a history of depression (e.g., Alpern & Lyons-Ruth, 1993; Dawson et al., 2003; Field, Lang, Martinez, & Yando, 1996; Gross,

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Conrad, Fogg, Willis, & Garvey, 1995). Of interest, the type of problem behavior appears to differ somewhat depending on the timing of the mother's depression. Specifically, preschool-age children of mothers with *chronic* depression have been reported by both mothers and teachers to exhibit significant elevations in hostile behavior (Alpern & Lyons-Ruth, 1993) and by mothers to exhibit elevations in aggressive and destructive behavior, as well as depressive symptoms (Field et al., 1996). Preschool-age children of mothers with depression that has *recently remitted* have been reported to exhibit significantly elevated rates of attention problems and demanding behavior by mothers and hyperactive behavior by teachers (Alpern & Lyons-Ruth, 1993). In contrast, preschool-age children of mothers with *previous* depression have been reported by both mothers and teachers to display elevated levels of anxious, fearful, and withdrawn behavior (Alpern & Lyons-Ruth, 1993).

Studies have demonstrated that school-age children of depressed caregivers also exhibit higher levels of both internalizing and externalizing problems, as reported by parents, teachers, and the children themselves, than do control children (for a review see Downey & Coyne, 1990). In one early review, school-age children who had a parent with depression were found to exhibit increased rivalry with siblings and peers, increased hyperactivity, and signs of isolation and depression; a summary of teacher reports indicated problems with classroom disturbance, impatience, disrespect and defiance, and inattentiveness and withdrawal (Beardslee et al., 1983). In more recent studies, school-age children have been shown to exhibit increased hyperactivity (Boyle & Pickles, 1997; Elgar, Curtis, McGrath, Waschbusch, & Stewart, 2003), hostility and aggression (Elgar et al., 2003; Langrock, Compas, Keller, Merchant, & Copeland, 2002; Lyons-Ruth, 1992), and conduct problems (Boyle & Pickles, 1997; Fendrich, Warner, & Weissman, 1990), as well as increased emotional problems (Elgar et al., 2003), including

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symptoms of anxiety and depression (Billings & Moos, 1983; Fendrich et al., 1990; Hammen et al., 1987; Langrock et al., 2002; Malcarne, Hamilton, Ingram, & Taylor, 2000). With regard to anxiety, specifically, in one recent longitudinal study examining risk factors associated with trajectories of anxiety across childhood, maternal depression during the first 3.5 years of the child's life was found to predict membership in the most deleterious trajectory, demonstrating high initial levels of anxiety symptoms that continued to increase over time (Feng, Shaw, & Silk, 2008). In turn, high levels of anxiety symptoms predicted subsequent anxiety, depressive, and comorbid anxiety and depressive disorders.

Studies with preadolescent and adolescent samples have also indicated increased levels of internalizing and externalizing problems among adolescent offspring of depressed versus non-depressed parents. With regard to externalizing problems, in a recent study examining the association between maternal depression and disruptive behavior problems in preadolescent boys (Barry, Dunlap, Cotten, Lochman, & Wells, 2005), maternal depression was found to be significantly associated with mother-reported child attention problems after controlling for socioeconomic status and maternal stress. Similarly, findings from a recent longitudinal study examining the role of maternal depression in the development of subsequent conduct problems among children diagnosed with attention-deficit/hyperactivity disorder (ADHD) indicated that when demographic variables and baseline ADHD and conduct problems were controlled, maternal depression predicted parent- and teacher-reported conduct problems across eight annual follow-up time points (Chronis et al., 2007).

With regard to internalizing problems, in a large community study of depressed and non-depressed mothers and their 15-year-old youth, Hammen and Brennan (2003) examined the effects of maternal depression during the first ten years of the child's life on children's

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subsequent risk for depression and other problems. They found that children exposed to maternal depression were twice as likely to have experienced depression themselves compared with children of never-depressed mothers; of particular relevance to the current study, children of depressed mothers were also twice as likely to have had an anxiety disorder. Of interest, in a subsequent study utilizing the same sample, Hammen, Shih, and Brennan (2004) found that the association between maternal and youth depression was largely mediated by maternal stress and parenting quality. Together, the groups of studies from the age groups reviewed above suggest that offspring ranging in age from infancy to adolescence are negatively impacted by maternal depression.

Although the majority of extant studies examining child outcomes of parental depression have used mother-only samples, a recent meta-analysis found that outcomes for child and adolescent offspring of fathers with depression were similar to those reported for offspring of mothers with depression (Kane & Garber, 2004). Specifically, depression in fathers was found to be significantly associated with both internalizing and externalizing symptoms in children. Moreover, the mean effect size across studies included in the meta-analysis, though small, was statistically significant and similar in size to effect sizes found for studies examining the relation between depression in mothers and child internalizing and externalizing problems.

1.1.3. Mechanisms of depression risk transmission

As there is now a substantial literature documenting negative outcomes in offspring of mothers with depression, recent research has shifted to identifying the mechanisms through which risk for adverse outcomes is transmitted. Goodman and Gotlib (1999) proposed a model of the transmission of psychopathology risk from mother to child that incorporates the following components: 1) genes/ heritability; 2) dysfunctional neuroregulatory mechanisms; 3) exposure

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to environmental and contextual stressors; and 4) exposure to negative maternal affect, cognitions, and behaviors, including parenting behaviors. Whereas the first two mechanisms are primarily biological in nature, the latter two are psychosocial in nature, and focus on interpersonal processes between depressed mothers and their children and important contextual factors that can negatively impact child development. All four mechanisms are described in the following paragraphs.

In the first mechanism of their model, Goodman and Gotlib (1999) propose that children of mothers with a history of depression inherit DNA that is different in important ways from that inherited by children of mothers without a depression history. The DNA inherited by children has both direct and indirect effects on their vulnerability to depression. With regard to direct effects, DNA is assumed to regulate children's biological mechanisms in ways that serve to increase or decrease their vulnerability to depression. Children of mothers with depression may therefore directly inherit a biologically-based predisposition to developing depression. With regard to indirect effects, children may also inherit vulnerabilities to personality traits (e.g., inhibited temperament, shyness), or cognitive or interpersonal styles (e.g., negative cognitive biases, low sociability) that make the development of depression more likely.

There is a substantial literature supporting the genetic transmission of depressive disorders in adults (for a review see Tsuang & Faraone, 1990). Combined findings from twin, adoption, and family studies indicate that the risk for an affective disorder in adult first-degree relatives of individuals with depression is 20% to 25%, compared with a general population risk of approximately 7% (Tsuang & Faraone, 1990). Findings from twin studies indicate that heritability rates are higher for clinical than for subclinical forms of depression (e.g., Kendler, Neale, Kessler, Heath, & Eaves, 1993). Of particular importance for transmission of depression

to children and adolescents, findings from family studies indicate a higher familial aggregation of early-onset (i.e., before age 20) than late-onset depression (e.g., Weissman et al., 1984). One recent family study tracking depression in three generations of adults found that children whose parents *and* grandparents had a history of depression were approximately five times more likely to develop an internalizing disorder than children whose parents, but not grandparents, had a depression history (Weissman et al., 2005). These findings suggest that there may be both familial and non-familial courses of depression, and that the familial courses may onset earlier in life.

There is also preliminary support for the heritability of child- and adolescent-onset depression (for a review see Goodman & Gotlib, 1999). Merikangas and colleagues found that the presence of a psychiatric diagnosis in the spouse or a first-degree relative of the depressed mother increased the risk of a psychiatric diagnosis in the children (Merikangas, Avenevoli, Dierker, & Grillon, 1988). Weissman and colleagues reported that children who become depressed manifest the disorder at an earlier age (M = 12.7 years) if they have a depressed mother than if their mother is not depressed (M = 16.8 years) (Weissman, Gammon, John, & Merikangas, 1987). Findings from another study by Weissman and colleagues indicated that early-onset depression in mothers (i.e., before age 20) was associated with a 14-fold increase in the risk of onset of major depression before age 13 in their children (Weissman, Warner, Wickramaratne, & Prusoff, 1988). Interestingly, some researchers have found the rates of depression to be higher in relatives of depressed children than in the relatives of both depressed adolescents (Williamson, Ryan, Birmaher, & Dahl, 1995) and depressed adults (Kovacs, Devlin, Pollock, Richards, & Mukerji, 1997).

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Goodman and Gotlib (1999) hypothesized in their model that children of mothers with depression may also indirectly inherit vulnerabilities to personality traits or cognitive or interpersonal styles that make the development of depression more likely. In support of this hypothesis, specific traits, including temperament, behavioral inhibition and shyness, self-esteem, neuroticism, sociability, subjective well-being, and expression of negative emotion, have been demonstrated in behavioral genetics studies to be highly heritable (for specific studies see Goodman & Gotlib, 1999).

In the second mechanism of their model, Goodman and Gotlib (1999) propose that infants of mothers who experience depression either during or immediately prior to their pregnancy may be born with dysfunctional neuroregulatory mechanisms resulting from prenatal insults that interfere with emotion regulation processes and, consequently, increase vulnerability to depression and other psychopathology. Studies have shown that the pregnancies of depressed women are characterized by neuroendocrine abnormalities, including increased plasma cortisol, beta-endorphin, and corticotrophin releasing hormone (CRH) levels during the period from 28 to 38 weeks of gestation (Handley, Dunn, Waldron, & Baker, 1980; Smith et al., 1990). Presumably as a direct consequence of these neuroendocrine abnormalities, infants of mothers identified as depressed during their pregnancies have been shown to exhibit reduced responding to social and non-social stimuli and decreased activity levels compared to infants of mothers who were not depressed (Abrams et al., 1995; Field et al., 1985). A strong association has also been found between mothers' depression symptom scores obtained during pregnancy and excessive crying and inconsolability in infants as reported by pediatricians blind to condition (Zuckerman, Bauchner, Parker, & Cabral, 1990).

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In the third mechanism of their model, Goodman and Gotlib (1999) propose that family contextual factors contribute to the development of psychopathology in children. Specifically, children of depressed mothers are exposed not only to their mother's depression, but also to a variety of stressors that are associated with the depression. Stressors identified have included marital and social relationship stress, job stress, financial stress, and stress stemming from relationships with children (Hammen et al., 1987). Indeed, children of depressed mothers have reported significantly more episodic and chronic stressors than children of mothers who are not depressed (Adrian & Hammen, 1993). Extant studies have also demonstrated that marital discord exacerbates the negative effects of maternal depression on child functioning (Fendrich et al, 1990; Goodman, Brumley, Schwartz, & Purcell, 1993).

In the final mechanism of their model, and the one that is most relevant to the current study, Goodman and Gotlib (1999) propose that mothers with depression expose their children to negative cognitions, behaviors, and affects that put them at increased risk for developing similar ways of thinking, behaving, and feeling. A related but separate aspect of this mechanism is that mothers with depression have difficulty meeting the social, emotional, and behavioral needs of their children via adequate parenting. Both the modeling of negative cognitions, behaviors, and affects and the inadequate parenting are hypothesized to place children of mothers with depression at increased risk for psychopathology.

There is ample empirical support for both aspects of this mechanism. With regard to the first aspect (i.e., modeling of negative cognitions, behaviors, and affects), individuals with depression demonstrate more negative self-perceptions and cognitions, including more internal, stable, and global attributions for negative events, increased attention to and memory for negative stimuli, high levels of self-punishment, and low levels of self-reinforcement and self-

efficacy (see Goodman & Gotlib, 1999). Individuals with depression are also more likely to endorse negative views of themselves as parents (Gelfand & Teti, 1990; Goodman et al., 1993), view themselves as having less control over their children's development, and perceive themselves as less able to positively influence their children (Kochanska, Kucynski, Radke-Yarrow, & Welsh, 1987). Individuals with depression also exhibit more negative behaviors in interactions with others (Gotlib, 1982), including more self-derogation, complaining, and dysfunctional problem-solving behaviors in interactions with spouses (Gotlib & Whiffen, 1989). In interactions with their children, mothers with depression display more sad and irritable affect and engage in more angry, intrusive, and hostile behaviors (Hops et al., 1987).

With regard to the second aspect (i.e., inadequate parenting), presumably as a direct consequence of the negative cognitions, behaviors, and affects that characterize their depression (Cummings & Davies, 1994; Goodman & Gotlib, 1999), the parenting behaviors of depressed mothers differ in important ways from the parenting behaviors of mothers without a depression history. According to Downey and Coyne (1990), parenting involves sustained effortful behavior that is likely to prove difficult for parents with depression. Depressed mothers have therefore been described as experiencing parenting difficulties that reflect the symptoms of their disorder (Burbach & Borduin, 1986).

Mothers with depression have difficulty parenting offspring of all ages, including infants, preschool and school-age children, and adolescents. In interactions with their infants, depressed mothers have been observed to provide less and lower quality stimulation (Livingood, Daen, & Smith, 1983), to be slower in responding and less contingently responsive (Field, 1984; Field, Healy, Goldstein, & Guthertz, 1990), and to use less reciprocal vocalization and affectionate contact (Fleming, Ruble, Flett, & Shaul, 1988; Sameroff, Seifer, & Zax, 1982).

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The parenting behaviors of mothers of toddler, preschool-age, and school-age children are also impacted when the mothers have depression. Depressed mothers have been found to spend less time mutually engaged in shared activity with their toddler- and preschool-age children (Goldsmith & Rogoff, 1997). Moreover, they have been shown to be more critical (i.e., scolding and nagging) (Hammen, Adrian, & Hiroto, 1988; Webster-Stratton & Hammond, 1988) and hostile (Gordon et al., 1989; Hammen et al., 1987), even after controlling for the adversity of the child behavior that prompted the maternal response (Panaccione & Wahler, 1986). Increased parental depressive symptoms have also been associated with less parental warmth and more parental psychological control (Cummings, Keller, & Davies, 2005).

With regard to discipline strategies with toddler- to school-age children, relative to mothers without depression, depressed mothers have been found to engage more frequently in escalating cycles of coercion rather than using strategies such as explanations, persuasion, and reasoning in their attempts to manage their young children (Burbach & Borduin, 1986; Cox, Puckering, Pound, & Mills, 1987; Panaccione & Wahler, 1986; Webster-Stratton & Hammond, 1988). A related finding for toddler- to school-age children is that mothers with depression more frequently choose child behavior management approaches that require less cognitive effort, including enforcing obedience unilaterally or withdrawing their direction when faced with resistance from the child. In contrast, comparison mothers are more likely to negotiate solutions with their children (Kochanska et al., 1987). Consistent with this finding is that mothers with depression have been shown to engage in more inconsistent discipline, characterized by lax under-control on the one hand, during times when low mood results in maternal withdrawal from conflictual parent-child interactions (see Elgar, McGrath, Waschbusch, Stewart, & Curtis, 2004; Hops et al., 1987), and, on the other hand, punitive

discipline strategies stemming from increased negative appraisals of and lowered tolerance for children's negative behaviors (Dumas, Gibson, & Albin, 1989; Forehand, Lautenschlager, Faust, & Graziano, 1986; Schaughency & Lahey, 1985).

Fewer studies have examined the association of parental depression and parenting behaviors in adolescent samples. Nonetheless, findings from existing studies suggest that parenting by these mothers is similarly impaired. For example, one study with preadolescent children found that parental depressive symptoms were associated with hostile behaviors by the parents, including parental rejection, withdrawal, coercive behaviors, and inconsistency (Parke et al., 2004). Another study with an adolescent sample found greater levels of maternal negative affect and both intrusive and withdrawn parenting behaviors for mothers with depression (Jaser et al., 2005).

In a recent meta-analytic review, Lovejoy, Graczyk, O'Hare, and Neuman (2000) provided a cohesive overview of the parenting difficulties exhibited by parents with depression when their children ranged in age from 2 days to 16 years old. They analyzed the results of 46 observational studies of parent-child interactions to determine the strength of the association between maternal depression and parenting behavior and to identify moderators of the association. Three main categories of parenting behaviors that have been assessed in the published literature were examined: 1) negative/ hostile behaviors, including negative maternal affect and hostile or coercive behaviors (e.g., threatening gestures, negative facial expressions, expressed anger, intrusiveness); 2) positive behaviors, including warmth, enthusiasm, praise, and affectionate contact; and 3) disengagement, including neutral affect, and behaviors indicative of lack of involvement with the child (e.g., ignoring, withdrawal, gaze aversion). Findings indicated a medium effect size for the association between maternal depression and

negative parenting behaviors, a small to medium effect size for the association between maternal depression and disengagement, and a small effect size for the association between maternal depression and positive parenting behaviors.

Importantly, Lovejoy et al. (2000) also identified several significant moderators of the relations between maternal depression and both negative and positive parenting behaviors. Timing of depression was found to moderate the relation with negative parenting behavior; specifically, larger effect sizes were found for studies examining current depression than for studies examining lifetime diagnoses of depression. Socioeconomic status (SES) and child age moderated the relation between depression and positive parenting behaviors. A moderate effect size was found for mothers with low SES, but the effect all but disappeared for mothers who were not of low SES. Similarly, a moderate effect size was found for studies of mothers with infants (<1 year), whereas a small effect size was found for studies of mothers with toddler- and preschool-age children (1-5 years). Lovejoy et al. interpreted this latter finding to suggest that older children, who are better able to initiate play interactions with their mothers, may be able to shape their mothers' behaviors toward them. Infants, in contrast, have little capability to engage their mothers in positive interactions, and so their interactions with their depressed mothers may suffer more as a result. Type and length of observation were also found to moderate the relation between depression and positive parenting behaviors. Specifically, the effects of depression were stronger when observations were 10 minutes or shorter than when observations were 11 to 59 minutes in length; the effects were also stronger when observations were conducted in unstructured compared to structured laboratory settings.

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1.1.4. Rationale for examining the association of parental depression and child anxiety

As previously reviewed, studies comparing offspring of mothers with depression to offspring of mothers who are not depressed have shown increased rates of both internalizing and externalizing problems (for reviews see Downey & Coyne, 1990; McKee et al., 2008b). However, when measures of specific child internalizing outcomes (i.e., depression and anxiety) have been examined, depression has been studied most frequently (e.g., Hammen et al., 1987; Malcarne et al., 2000). Moreover, few studies have examined the predictive role of maternal depression in the development of subsequent child anxiety problems specifically (see Feng et al., 2008, for an exception); rather, anxiety has been identified as one of many maladaptive outcomes in studies examining the consequences for offspring of having a caregiver with depression (e.g., Billings & Moos, 1983; Elgar et al., 2003; Fendrich et al., 1990; Langrock et al., 2002; Weissman et al., 1987; Weissman et al., 2006b; Weissman et al., 2005). Although the focus on depression outcomes and on identifying the multitude of possible outcomes for children of depressed caregivers is logical given our current understanding of the mechanisms of depression risk transmission, it is equally important that we examine the association between parental depression and other types of internalizing problems, including child anxiety outcomes.

There are four key reasons to examine the association between parental depression and child anxiety: 1) anxiety and depressive disorders are highly comorbid in both adults and children; 2) offspring of parents with depression are at increased risk for developing an anxiety disorder due to familial aggregation of anxiety and depressive disorders; 3) anxiety disorders appear to be a consistent precursor for depressive disorders; 4a) specific, overlapping parenting behaviors have been implicated in the development of both depressive and anxiety disorders in

children; and 4b) these same parenting behaviors are characteristic of depressed caregivers. Each of these reasons is explicated below.

First, high rates of comorbidity for anxiety and depressive disorders have been found among adults and children. Recent epidemiological data indicate high rates of comorbid anxiety among adults with depression, with 59% of individuals with lifetime depression also meeting criteria for an anxiety disorder (Kessler et al., 2003). Additional epidemiological data indicate statistically significant comorbidities between major depression and multiple DSM-assessed anxiety disorders, including panic disorder with and without agoraphobia, social anxiety disorder, generalized anxiety disorder, obsessive-compulsive disorder, and post-traumatic stress disorder (Andrade et al., 2003). Among children and adolescents, specifically, comorbidity rates ranging from 30% to 75% have been reported for the two disorders (Angold & Costello, 1993; Clark, Smith, Neighbors, & Skerlec, 1994).

Second, substantial research demonstrates that anxiety and depressive disorders aggregate in families, placing offspring of parents with depression at increased risk for developing anxiety disorders. For example, findings from a longitudinal examination of psychopathology outcomes among offspring of depressed and non-depressed caregivers (Weissman et al., 2006b) indicated a threefold increased risk of anxiety disorders in the offspring of the depressed caregivers that was not explained by comorbid anxiety in the parents. Similarly, in a unique investigation of familial aggregation of psychiatric disorders across three generations, Weissman and colleagues (2005) found particularly high rates of anxiety disorders among grandchildren with two previous generations of major depression, with 45% of these children meeting criteria for an anxiety disorder. In comparison, among these same grandchildren, only 27% and 14%, respectively, met criteria for a disruptive behavior or

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substance abuse disorder. Moreover, and of particular significance to the current study, only 30% of the grandchildren met criteria for a mood disorder, indicating that anxiety disorders were even more common than mood disorders among preadolescent grandchildren with both a parent and a grandparent with depression. A comparison of relative risk of psychopathology for grandchildren with *both* a depressed grandparent and a depressed parent, and grandchildren with a depressed grandparent but *not* a depressed parent revealed that the former group had more than a fivefold increased risk of an anxiety disorder but only a twofold increased risk of a mood disorder. Given the preadolescent age of the grandchildren in this study, along with previous findings suggesting that anxiety disorders in children may precede later depressive disorders (Kessler, Avenevoli, & Merikangas, 2001; Pine, Cohen, Gurley, Brook, & Ma, 1998; Reinherz, Paradis, Giaconia, Stashwick, & Fitzmaurice, 2003; Wickramaratne & Weissman, 1998), Weissman et al. interpreted these findings to suggest that anxiety in children may be viewed as a precursor for later depression in adolescents and young adults.

The hypothesis that anxiety may be a precursor for the development of depression in offspring is the third key reason to examine the relation between parental depression and child anxiety outcomes. Several lines of research offer support for this hypothesis. An initial source of evidence comes from early studies suggesting that the mean age of children with anxiety disorders is younger than the mean age for children with depressive disorders (e.g., Hershberg, Carlson, Cantwell, & Strober, 1982; Stavrakaki, Vargo, Boodoosingh, & Roberts, 1987). Another source of support comes from studies showing that the majority of children and adolescents with comorbid depression and anxiety become anxious before they become depressed (e.g., Kovacs, Gatsonis, Paulauskas, & Richards, 1989; Lewinsohn, Zinbarg, Seeley, Lewinsohn, & Sack, 1997; Orvaschel, Lewinsohn, & Seeley, 1995). A third source of support comes from longitudinal

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studies designed to predict symptoms of depression at one time point from symptoms of anxiety at an earlier time point; findings from these studies indeed suggest that early anxiety symptoms predict later symptoms of depression in youth (Feng et al., 2008; Lewinsohn, Gotlib, & Seeley, 1995; Reinherz et al., 1993).

Whereas none of these groups of studies provides conclusive evidence for the hypothesis that the development of anxiety precedes the development of depression in offspring, two lines of recent research provide stronger support. First, long-term follow-up studies and national, as well as international, representative sampling studies with wide age ranges have been conducted. In a 20-year follow-up assessment of psychopathology outcomes among offspring of depressed and non-depressed caregivers, Weissman et al. (2006b) found that the peak incidence of anxiety disorders occurred between the ages of 5 and 10 in the offspring, with incidence rates declining after age 12, whereas the peak incidence of major depressive disorder occurred between the ages of 15 and 20. In two reports from the NCS-R, Kessler and colleagues found that the median age of onset for anxiety disorders (age 11) was much earlier than the median age of onset for mood disorders (age 30) across the lifespan (Kessler, Berglund, Demler, Jin, & Walters, 2005). They also found that only 13% to 14% of respondents with a history of major depression and comorbid anxiety had an earlier onset of their depressive disorder relative to their anxiety disorder (Kessler et al., 2003). Findings from a second epidemiological study, in which community surveys were administered in 10 countries across North America, Latin America, Europe, and Asia, indicated that, in all countries, major depressive episodes were temporally secondary to anxiety disorders the majority of the time (Andrade et al., 2003). Specifically, the proportion of respondents with lifetime comorbid anxiety and depression whose anxiety began at an earlier age than their depression ranged from

53% in Germany to 80% in the Czech Republic, whereas the proportion of respondents whose depression began at an earlier age than their anxiety ranged from 16% in the United States to 32% in Mexico (the remainder of respondents had same-year onsets of the two disorders). Importantly, anxiety disorders were consistent and powerful predictors of subsequent onset of major depression, with odds ratios ranging from 9.4 for post-traumatic stress disorder to 81.6 for generalized anxiety disorder. Taken together, the findings from these studies suggest that parental depression may contribute to child anxiety initially, followed by subsequent onset of child depression in some children.

A second type of study to provide strong support for anxiety preceding depression in onset order is a longitudinal design in which anxiety and depression are both measured repeatedly. Cole and colleagues utilized a three-year longitudinal design to examine the temporal relation between anxiety and depressive symptoms in a large community sample of third through sixth graders (Cole, Peeke, Martin, Truglio, & Seroczynski, 1998). Using both parent- and child-report of anxiety and depressive symptoms in six waves of cross-lagged data over three school years, they found that increased levels of anxiety symptoms in offspring predicted small but significant increases in reports of depressive symptoms over time. In contrast, increased levels of depressive symptoms did not predict increases in anxiety over time; rather, partial evidence emerged suggesting that the opposite was true (parents who perceived higher levels of depression in their children at one point in time tended to report diminished levels of anxiety in their children at a subsequent time point). Importantly, because both anxiety and depression were measured at all time points, Cole et al. could control for previous levels of these variables in their statistical models.

The fourth and last reason for examining the association between parental depression and child anxiety stems from findings within two areas of the parenting literature, namely that 1) the same parenting behaviors are implicated in the development of depression and anxiety in children, and 2) many of the parenting behaviors that characterize parents with depression overlap with those associated with child anxiety outcomes. The findings from these two areas of the parenting literature are reviewed in detail in the following paragraphs.

First, recent reviews implicate several of the same parenting behaviors in the development of depression and anxiety in offspring (Bögels & Brechman-Toussaint, 2006; Ginsburg & Schlossberg, 2002; McLeod, Weisz, & Wood 2007a; McLeod, Wood, & Weisz, 2007b; Rapee, 1997; Wood, McLeod, Sigman, Hwang, & Chu, 2003). Specifically, parental rejection and control, two broad parenting factors that have emerged from factor analytic studies of childrearing dimensions (see Rapee, 1997), have been consistently associated with both depression and anxiety in children.

In his review of primarily retrospective studies with anxious adults, Rapee (1997) found consistent evidence to support associations between parental rejection and control and current reports of both anxiety and depression in offspring, with this finding holding more consistently among clinical than non-clinical populations. Moreover, data reviewed by Rapee from relatively fewer parent-report and observational studies of parent-child interactions provided initial support for the results obtained from retrospective reports and indicated increased levels of depression and anxiety among offspring of rejecting and controlling parents.

Two timely meta-analyses examining the associations between parenting and child depression (McLeod et al., 2007a) and parenting and child anxiety (McLeod et al., 2007b) also examined the broad parenting dimensions of parental rejection and control. Consistent with

previous literature (see Bögels & Brechman-Toussaint, 2006; Ginsburg & Schlossberg, 2002),

McLeod and colleagues define *rejection* as low levels of parental warmth, approval, and

responsiveness (i.e., high levels of coldness, disapproval, and unresponsiveness). Parental

rejection is hypothesized to put children at increased risk for developing depression by

undermining self-esteem, promoting a sense of helplessness, and prompting development of

negative self-schemas. In a similar manner, parental rejection is theorized to put children at

increased risk for developing anxiety problems by undermining children's emotion regulation

and increasing sensitivity to anxiety. Also consistent with previous literature, McLeod et al.

define *control* as excessive parental regulation of children's activities and routines,

encouragement of children's dependence on parents, and instruction to children on how to

think or feel. Parental control is hypothesized to set the stage for child depression by reducing

perceived mastery and control, leading to helplessness, a well-known risk factor for depression.

Similarly, theoretical models posit that when parents are highly controlling in contexts in which

it is developmentally appropriate for children to act independently, children may experience

decreased self-efficacy and increased anxiety about their ability to function autonomously. The

same models hypothesize that parental encouragement of children's autonomy and

independence in appropriate contexts may augment children's perceptions of mastery over

their environment, leading to anxiety reduction.

McLeod and colleagues (2007a; 2007b) found an effect size of .28 for the association

between parenting and child depression, with parenting explaining approximately 8% of the

variation in child depression; they found an effect size of .21 for the association between

parenting and child anxiety, with parenting accounting for approximately 4% of the variation in

child anxiety. Parenting thus appears to be consistently, albeit modestly, associated with both

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depression and anxiety in children. Moreover, the effect sizes were similar for the associations

between parental rejection and child depression (ES = .28) and anxiety (ES = .20), and between

parental control and child depression (ES = .23) and anxiety (ES = .25), suggesting that these

parenting constructs are important in both childhood disorders.

In addition to examining parental rejection and control, McLeod and colleagues (2007a;

2007b) examined the associations of specific sub-dimensions of parental rejection (i.e., warmth,

aversiveness, withdrawal) and control (i.e., over-involvement, autonomy-granting) to child

depression and anxiety. Based on previous literature, McLeod et al. defined *withdrawal* as lack

of involvement between parent and child, lack of interest by the parent in the activities of the

child, or lack of emotional support/ reciprocity; *aversiveness* as parental hostility toward the

child (e.g., criticism, punishment, conflict), hypothesized to reflect a lack of parental acceptance;

warmth as a sense of positive regard expressed by the parent toward the child, pleasant

interactions shared between parent and child, or positive involvement by the parent in the

child's activities; *over-involvement* as parental interference with the child's age-normative

autonomy and emotional independence, boundary problems (e.g., parent-child role reversal),

excessive restrictiveness, and encouragement of excessive dependence of the parent; and

autonomy-granting as parental encouragement of the child's opinions and choices,

acknowledgement of the child's independent perspectives on issues, and solicitation of the

child's input in decision-making and problem-solving.

Table 1 below lists the effect sizes obtained by McLeod and colleagues (2007a; 2007b)

for the associations between each parenting sub-dimension and child depression and anxiety.

Of note, a medium effect size was found for the relation between autonomy-granting and

anxiety (autonomy-granting was not examined in relation to child depression), and a relatively

small effect size was found for the relation between warmth and anxiety. The effect sizes for the remaining associations between the parenting sub-dimensions and child depression and anxiety were in the small to medium range. Thus, although some differences emerged in the strength of the associations between the parenting sub-dimensions and child depression and anxiety, the same sub-dimensions, broadly speaking, were implicated in both childhood disorders.

Table 1: Effect sizes found by McLeod et al. (2007a; 2007b) for child depression and anxiety

	Mean ES	
Parenting Sub-Dimension	Child Depression	Child Anxiety
Warmth (r)	.28	.06
Aversiveness (r)	.33	.23
Withdrawal (r)	.20	.22
Over-involvement (c)	.24	.23
Autonomy-granting (c)	n/a	.42

Note. (r) = rejection; (c) = control.

Of note, McLeod and colleagues (2007a; 2007b) included only studies with a direct measure of parenting and excluded studies whose measure of parenting was drawn from a broader measure of family functioning. Also of importance, they examined potential moderators of the relation between parenting and anxiety, including methodological variables (i.e., measurement technology and reporter), demographic variables (e.g., child age and parent gender), and diagnostic status (i.e., whether the participants merely exhibited anxiety symptoms or were diagnosed with an anxiety disorder). Consistent with previous reviews, moderator analyses indicated stronger associations between parenting and child anxiety when 1) studies examined presence or absence of diagnosis rather than anxiety symptoms, and 2) studies utilized observational methodology to measure parenting behavior rather than obtaining parent self-reports of their behavior (McLeod et al., 2007b).

Theoretically, the same parenting behaviors may be associated with both anxiety and depression in children and adolescents because the two internalizing disorders share a common developmental pathway. In a recent study, Feng et al. (2008) identified the developmental trajectories of childhood anxiety symptoms and associated risk factors in a sample of preschool- and school-age boys. They found that maternal negative control was positively associated with trajectories depicting increasing levels of anxiety symptoms over time. In turn, increasing levels of anxiety symptoms were associated with subsequent diagnoses of anxiety, depression, and co-occurring anxiety and depression. These findings suggest that maternal control may lead to anxiety symptoms, which may then lead to depressive disorders.

Using the recent meta-analysis by McLeod et al. (2007b) as a guide, two broad and five specific parenting behaviors have emerged as important determinants of the development of anxiety in children. The two broad factors, rejection and control, were found to be modestly but consistently associated with anxiety problems in children. The five specific parenting behaviors, warmth, aversiveness, over-involvement, withdrawal, and autonomy-granting, were found to be associated with child anxiety to differing degrees. Medium effect sizes were found for the associations of aversiveness, over-involvement, and withdrawal with child anxiety. A medium effect size was found for the association of autonomy-granting with child anxiety (autonomy-granting has not previously been examined in the depression literature). In contrast, a small effect size was found for the association of warmth with child anxiety. These findings suggest that *aversiveness, over-involvement, withdrawal, autonomy-granting,* and, to a lesser extent, *warmth* are consistently associated with child anxiety outcomes.

Findings from a second area of the parenting literature also suggest that the association between parental depression and child anxiety is important to examine. Specifically, many of

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the parenting behaviors that characterize parents with depression have been associated with child anxiety outcomes. Using the recent meta-analysis by Lovejoy et al. (2000) as a guide, three main categories of parenting behaviors by parents with depression have emerged in the published literature: 1) negative behaviors, including hostility and intrusiveness; 2) positive behaviors, including warmth; and 3) disengagement, including withdrawal. As previously reviewed, findings from the Lovejoy et al. meta-analysis indicated a medium effect size for the association between maternal depression and negative parenting behaviors, a small to medium effect size for the association between maternal depression and disengagement, and a small effect size for the association between maternal depression and positive parenting behaviors. These findings suggest that *hostility, intrusiveness, withdrawal,* and, to a lesser extent, *warmth* are characteristic behaviors among parents with depression.

The overlap of parenting behaviors characteristic of parents with depression and parenting behaviors associated with child anxiety is considerable, with hostility/ aversiveness, intrusiveness/ over-involvement, withdrawal, and, to a lesser extent, warmth being associated with both parental depression and child anxiety. Autonomy-granting by parents, or parental encouragement of and support for children's age-normative independence, appears to be the most consistent and strongest predictor of child anxiety in non-depressed samples of parents; however, its role as a parenting behavior in samples of depressed parents has not been identified. Interestingly, limited support has been found for the associations between maternal depression and warmth, and warmth and subsequent anxiety in children. The lack of consistent support for the former association is particularly surprising given the emphasis in the depression literature on a theoretical link between increased depression levels and decreased ability by

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caregivers to devote energy to engaging in warm interactions with their children (see Cummings & Davies, 1994; Goodman & Gotlib, 1999).

1.1.5. Child anxiety background

Child anxiety is important to study for several reasons. First, the rates of anxiety in children are high. Anxiety disorders are among the most common psychiatric problems experienced by children, with prevalence rates ranging from 3% to 15% (Costello & Angold, 1995). Moreover, anxiety disorders appear to remain stable and problematic for youths throughout childhood and adolescence (McLeod et al., 2007b). Many children with anxiety have difficulty attending and performing in school, struggle with making and maintaining friendships, and experience significant personal distress (for a review see Silverman & Ginsburg, 1998). Importantly, anxiety disorders do not tend to remit with time but instead appear to continue into adulthood; one longitudinal study found that children with anxiety disorders face a two- to four-fold increased risk for having an adult anxiety disorder (Pine et al., 1998). Together, these findings suggest that childhood anxiety disorders are important to study to identify targets for prevention and treatment (Ginsburg & Schlossberg, 2002).

1.1.6. Summary

The studies reviewed above indicate that children and adolescents living with a depressed caregiver are at increased risk for a wide range of internalizing and externalizing problems over the course of their development. Among studies examining internalizing outcomes, depression has been studied more frequently than anxiety; nevertheless, a number of studies have suggested possible links between maternal depression and child anxiety. There are important reasons for examining the association between parental depression and child anxiety specifically. Anxiety and depressive disorders are highly comorbid in both adults and

children. Likely as a consequence of this comorbidity, offspring of parents with depression are at increased risk for developing an anxiety disorder due to familial aggregation of anxiety and depressive disorders. Importantly, not only are anxiety and depressive disorders highly comorbid, but anxiety disorders also appear to be a consistent precursor for depressive disorders, pointing to the value of targeting anxiety problems early in children's development. Finally, specific, overlapping parenting behaviors (i.e., hostility, intrusiveness, withdrawal, and warmth) have been implicated in the development of both depressive and anxiety disorders in children. Moreover, these same parenting behaviors are characteristic of depressed caregivers. Presumably as a direct consequence of the negative cognitions, behaviors, and affects that characterize their depression, depressed parents engage in more negative, hostile, and intrusive parenting, more withdrawn and disengaged parenting, and less warm and affectionate parenting than mothers who are not depressed.

In their recent conceptualization of the mechanisms by which depression is transmitted from parent to child, Goodman and Gotlib (1998) hypothesized that parenting behavior may be one important mediator of the association between maternal depression and subsequent child psychopathology. Thus, parenting behavior may be one mechanism through which parental depression leads to the development of anxiety problems in offspring. Parents with depression may engage in specific parenting behaviors that result in increased levels of anxiety in their children.

According to Baron and Kenny (1986), a given variable can be said to function as a mediator to the extent that it accounts for the relation between the predictor variable and the outcome variable. Mediators, in other words, speak to how or why associations occur. A finding that parenting is a significant mediator of the association of parental depression and

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child anxiety would provide support for Goodman and Gotlib's hypothesis that parenting is one of the mechanisms through which psychopathology is transmitted from parent to child and, more specifically, through which children of parents with depression develop problems with anxiety.

1.2. Purpose, Mediation Model, and Hypotheses

1.2.1. Purpose

The purpose of the current study was to test a meditational model of the associations of parental depression, parenting behavior, and child anxiety. *First*, the association of parental depression to child anxiety was examined. *Second*, the association of parental depression to parenting behavior was examined. *Third*, the associations of the four specific parenting behaviors (i.e., hostility, intrusiveness, withdrawal, and warmth) to child anxiety outcomes were examined. *Fourth* and last, each specific parenting behavior was examined as a mediator of the association between parental depression and child anxiety.

With regard to parental depression, studies have demonstrated that parenting behavior is more strongly impacted by current depression than by other depression indicators, such as history of depressive episodes (Hammen et al., 1987; Lovejoy et al., 2000). Therefore, current depressive symptoms were examined. With regard to parenting, McLeod et al. (2007b) found the strongest associations between parenting and child anxiety when observational data were utilized. Therefore, observational data from parent-child interactions were used in the current study. The four specific parenting behaviors (i.e., hostility, intrusiveness, withdrawal, and warmth) found to be both characteristic of parents with depression *and* associated with child anxiety outcomes based on the literature reviewed previously were examined. With regard to child anxiety, continuous measures of child anxiety symptoms were used to examine whether

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higher levels of parental depressive symptoms and particular parenting behaviors were associated with higher levels of anxiety symptoms in offspring. Compared to categorical approaches, continuous, or dimensional, approaches better capture symptom severity (Bell-Dolan, Last, & Strauss, 1990; Schniering, Hudson, & Rapee, 2000; Wadsworth, Hudziak, Heath, & Achenbach, 2001) and subclinical levels of anxiety, the latter of which have been associated with impaired functioning and the developmental of anxiety disorders (Beidel, Fink, & Turner, 1996; Gurley, Cohen, Pine, & Brook, 1996; Masi, Mucci, Favilla, Romano, & Poli, 1999).

1.2.2. Mediation model

According to Baron and Kenny (1986), a variable functions as a mediator when the following conditions are met: 1) variations in levels of the independent variable significantly account for variations in the presumed mediator (path *a*); 2) variations in levels of the presumed mediator significantly account for variations in the dependent variable (path *b*); 3) variations in levels of the independent variable significantly account for variations in the dependent variable (path *c*); and 4) when paths *a* and *b* are controlled, the previously significant relation between the independent and dependent variables (path *c*) is no longer significant. With regard to the last condition, when path *c* is reduced to zero, there is strong evidence for a single, dominant mediator; when path *c* is not reduced to zero, there is evidence for multiple mediating factors. Goodman and Gotlib (1999) proposed four mechanisms for transmission of psychopathology from parent to child. As a consequence, path *c* would not be expected to be reduced to zero in an examination of the role of parenting as a mediator of the association between parent depression and child anxiety. Below is the model that was tested in the current study, depicting parenting behavior as a mediator of the association between parent depression and child anxiety.
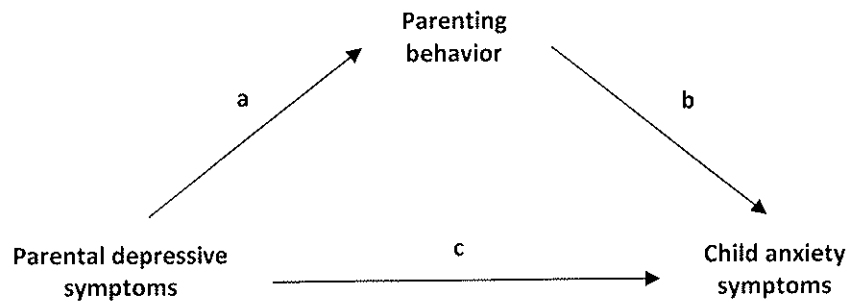
Figure 1: Proposed mediation model

1.2.3. Hypotheses

The four primary hypotheses for the current study are delineated below with regard to each criterion proposed by Baron and Kenny (1986) for testing a mediation model.

Hypothesis 1: With regard to path c, it was expected that parental depressive symptoms would be significantly and positively associated with parent and child reports of child anxiety symptoms, such that higher levels of parental depressive symptoms would be associated with higher levels of child anxiety symptoms.

Hypothesis 2: With regard to path a, it was expected that parental depressive symptoms would be significantly associated with each of the four parenting behaviors of interest, such that higher levels of parental depressive symptoms would be significantly associated with higher levels of observed hostility, intrusiveness, and withdrawal, and lower levels of warmth.

Hypothesis 3: With regard to path b, it was expected that observed hostility, intrusiveness, and withdrawal would each be significantly associated with parent and child reports of child anxiety symptoms, such that higher levels of hostility, intrusiveness, and withdrawal would be significantly associated with higher levels of child anxiety symptoms.

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Given the relatively low effect size found for the association between parental warmth and child anxiety in the meta-analysis conducted by McLeod et al. (2007b), a significant association between these two variables was not expected.

Hypothesis 4: It was expected that observed hostility, intrusiveness, and withdrawal would each separately and significantly mediate the associations between parental depressive symptoms and parent-reported child anxiety symptoms and between parental depressive symptoms and child-reported child anxiety symptoms. Specifically, it was hypothesized that the associations between parental depressive symptoms and parent- and child-reported child anxiety symptoms would be significantly reduced when hostility, intrusiveness, and withdrawal were included in the regression equation. As in hypothesis two, in light of the relatively low effect size found for the association between parental warmth and child anxiety across the extant literature (McLeod et al., 2007b), parental warmth was not expected to significantly mediate the association between parental depressive symptoms and child anxiety symptoms.

CHAPTER 2: METHOD

2.1. Overview

Raising Healthy Children (RHC) is a randomized, controlled efficacy trial and preventive

intervention funded by the National Institutes of Mental Health to prevent the incidence of

mental health problems among children of depressed parents. The intervention being tested is

a 12-session (i.e., 8 weekly, followed by 4 monthly, sessions), multi-family, cognitive-behavioral

program that is comprised of the following components: psychoeducation regarding the

etiology and treatment of depression, child coping skills (e.g., acceptance, distraction, cognitive

reappraisal), and parenting skills (e.g., appropriate and consistent discipline, positive

reinforcement). The active control involved self-study of psychoeducational materials that were

mailed to participants' homes during the same time period in which the group intervention took

place. Families in both the intervention and self-study conditions participated in assessments at

baseline, 2-, 6-, 12-, 18-, and 24-month intervals. Although the RHC study will continue to follow

families longitudinally over a period of two years, the current study used baseline data only.

2.2. Participants

To be eligible for participation in the RHC study, families were required to have: 1) a

target parent with either a current MDD or dysthymia diagnosis, or a past MDD or dysthymia

diagnosis that occurred during the lifetime of their oldest participating child; and 2) at least one

child between the ages of 9 years and 15 years, 11 months. In addition, the following exclusion

criteria were utilized: 1) families were excluded from participating in the study if any parent met

diagnostic criteria for lifetime bipolar I disorder or lifetime schizophrenia; 2) children were

permanently excluded from participating if they were diagnosed with current conduct disorder,

lifetime bipolar I disorder, lifetime schizophrenia, or a pervasive developmental disorder; 3)

families were temporarily excluded from participating (for a 2-month period) if any child was diagnosed with a current depressive disorder or current alcohol or substance abuse or dependence; and, 4) families were temporarily excluded if no participating parent had an interviewer-determined Global Assessment of Functioning score that was greater than or equal to 51. These exclusion criteria were established as a means to ensure that parents and children were capable of participating in the study and, with regard to current child depression, that children did meet criteria at the outset of the study for the primary outcome of interest.

Demographic data for the sample used in the current study is presented in Table 2. The sample consisted of 104 parents (91 mothers, 13 fathers; Mage = 41.5 years, SD = 8.1 years) with a current and/or previous diagnosis of MDD or dysthymia and their 131 children (64 female, 67 male; Mage = 11.5 years, SD = 2.0 years). Families for the RHC study were recruited from Burlington, Vermont, and Nashville, Tennessee and surrounding areas to participate in a cognitive-behavioral, family-based intervention program for the prevention of child and adolescent psychopathology. Recruitment strategies included mental health care provider and primary care physician referrals, local newspaper and radio advertisements, and flyers posted in the community. Participating target parents were largely Caucasian (79.8%), well educated (83.7% reported at least some college), and married or living with a partner (57.7%). Sixty-one parents had more than one eligible child; all eligible children who participated in RHC were included in the data analyses for the current study. Eight participants were not included in the current sample due to missing data: six families were missing child-reported outcome data, one family was missing parent-reported child outcome data, and one family was missing parental anxiety data. As previously reported, all data for the current study were drawn from the baseline assessment.

2.3. Measures

2.3.1. Demographic information

Demographic data were obtained from each target parent in the RHC study during the baseline assessment with surveys designed for this purpose. The following demographic variables, described in Table 2, were utilized in data analyses in the current study: parent gender, age, ethnicity/ race, marital status, education level, and annual family income, and child gender and age.

2.3.2. Parental depression

The *Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Patient Edition* (SCID-I/P; First, Spitzer, Gibbon, & Williams, 2001) was used in the RHC study to assess parental psychopathology for purposes of study inclusion and exclusion. The SCID-I/P is a semi-structured interview designed to reliably measure Diagnostic and Statistical Manual-Fourth Edition (DSM-IV; APA, 1994) Axis I diagnoses. Organization of the SCID-I/P is hierarchical, with decision trees guiding continuation or termination of module administration. Clinical interviewers score each item on a 3-point scale, with '1' indicating that the symptom is absent, '2' indicating that the symptom is present at a subthreshold level, and '3' indicating that the symptom is present at a threshold level. The Major Depressive Episode (MDE) section of the Mood Episodes Module of the SCID-I/P was used in the RHC study to establish a current or previous diagnosis of MDE in the target parent. A diagnosis of MDE was assigned if the target parent met threshold criteria for five of nine symptoms, including at least one cardinal feature of major depression (i.e., sad mood or the loss of interest or pleasure in almost all daily activities). Other symptoms that count toward diagnosis are: 1) significant weight loss or gain or change in appetite, 2) sleep disturbance, such as insomnia or hypersomnia, 3) psychomotor

Table 2: Descriptive statistics for demographic variables

	M	SD	%
TP Gender			87.5 (female)
TP Age	41.5	8.1	
TP Race			
Caucasian			79.8
Black or African American			13.5
Asian			1.0
Latino or Hispanic			1.9
American Indian or Alaska Native			1.0
Mixed			2.9
TP Marital Status			
Married or Living with a Partner			57.7
Widowed			1.0
Divorced			21.2
Separated			7.7
Never Married			12.5
TP Education Level			
Less than High School			6.7
High School or Equivalent			9.6
Some College or Technical School			37.5
College Graduate			25.0
Graduate Education			21.2
TP Household Income Level			
Under $5000			6.7
$5,000-$9,999			5.8
$10,000-$14,999			1.9
$15,000-$24,999			11.5
$25,000-$39,000			18.3
$40,000-$59,999			18.3
$60,000-$89,999			19.2
$90,000-$179,999			14.4
Over $180,000			3.8
Child Gender			48.9 (female)
Child Age	11.5	2.0	

Note. N = 104 Target Parents and 131 Children.

agitation or retardation, 4) fatigue or diminished energy, 5) difficulty thinking, concentrating, or

making decisions, 6) feelings of worthlessness or excessive or inappropriate guilt, and 7)

preoccupation with death, suicidal ideation, or suicide attempts. In addition, the symptoms

must cause significant clinical impairment or distress in interpersonal relationships, interfere

with household or occupational responsibilities, or impair performance in other functional

domains. Depressive symptoms must not be due to a general medical condition, alcohol or drug

use, or bereavement (APA, 1994). If the parent did not meet criteria for current or past MDE,

then the Dysthymic Disorder section of the Mood Episodes Module was administered. The

Manic Episode and Hypomanic Episode sections of the Mood Episodes Module, the Delusions

and Hallucinations sections of the Psychotic Symptoms Module, and the Alcohol and Substance

Abuse and Dependence sections of the Substance Use Disorders Module were also administered

to assess for lifetime bipolar disorder, schizophrenia, and alcohol and substance use for

purposes of study exclusion.

Adequate reliability and validity have been demonstrated for the SCID-I/P. Moderate

test-retest reliability has been established for current episodes with clinical participants (mean

Kappa = .61) (Williams et al., 1992). Although relatively fewer concurrent validity studies have

been conducted with the SCID-I/P, available data suggest a high level of agreement between

SCID-I/P mood disorder diagnoses and composite diagnoses made by psychiatrists (Maziade et

al., 1992). Tests of convergent validity using receiver operating characteristics (ROC) analyses

suggest that the Hamilton Depression Rating Scale (HDRS; Hamilton, 1960) and the Beck

Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) can identify SCID-

I/P depression and dysthymia diagnoses (Stukenberg, Dura, & Kiecolt-Glaser, 1990).

The *Beck Depression Inventory-II* (BDI-II; Beck, Steer, & Brown, 1996) was used in the current study to assess current levels of parental depressive symptoms. The BDI-II is a well-established, widely-used 21-item self-report inventory designed to assess cognitive, affective, and physiological symptoms associated with the depression criteria set forth for major depressive disorder in the DSM-IV (1994). Participants were asked to indicate which of four statements reflecting varying degrees of symptom severity was representative of how they were feeling over the past two weeks (e.g., "I do not feel sad" is scored 0, "I feel sad much of the time" is scored 1, "I am sad all of the time" is scored 2, and "I am so sad or unhappy that I can't stand it" is scored 3). Higher scores are indicative of more severe depressive symptoms, with scores ranging from 14 to 19 indicating mild depression, scores ranging from 20 to 28 indicating moderate depression, and scores ranging from 29 to 63 indicating severe depression. The BDI-II has good convergent and discriminant validity (Osman et al., 2005), stable internal consistency (α = .90; Beck, Steer, Ball, & Ranieri, 1996), and high test-retest reliability over a one week period (i.e., r = .93; Beck et al., 1996). Total scores from the BDI-II were used in the current study as a continuous measure of parental depressive symptoms. Internal consistency for the current sample was high (α = .92).

2.3.3. Parental anxiety

The *Beck Anxiety Inventory* (BAI; Beck & Steer, 1996) was used in the current study to assess and control for current levels of parental anxiety symptoms. The BAI is a well-established, widely-used, 21-item self-report inventory designed to assess current anxiety symptoms in adults and to reliably discriminate symptoms of anxiety and depression. Participants were asked to indicate which of four statements reflecting varying degrees of symptom severity was representative of how they were feeling over the past two weeks.

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Scoring for each item ranges from 0 to 3, with 0 indicating an absence of that particular symptom (e.g., "I have no numbness or tingling") and 3 indicating the most severe level of that symptom (e.g., "Feelings of numbness or tingling bother me severely"). Thus, higher total scores are indicative of more severe anxiety symptoms, with scores ranging from 8 to 15 indicating mild anxiety, scores ranging from 16 to 25 indicating moderate anxiety, and scores ranging from 26 to 63 indicating severe anxiety. The BAI has been demonstrated to have excellent internal consistency (α = .92) and to correlate moderately with other measures of anxiety, such as the revised Hamilton Anxiety Rating Scale (r = .51) (Beck & Steer, 1990). Total scores from the BAI were used in the current study as a continuous measure of parental anxiety symptoms. Internal consistency for the current sample was high (α = .92).

2.3.4. Parenting behavior

Two measures of parenting behavior were examined in the current study, one in primary analyses and the other in secondary analyses. DVD-recorded parent-child interactions for the RHC study are conducted in private laboratory spaces at the University of Vermont and Vanderbilt University. At baseline, parents and children participated in two 15-minute interactions. For the first interaction, they were instructed to spend 15 minutes discussing a recent pleasant activity in which the parent and child participated together (e.g., family vacation, outing, other special activity). For the second interaction, the parent and child were instructed to spend 15 minutes discussing a recent activity that was a source of stress. If possible, they were asked to identify a stressful activity that occurred during a time when the parent was feeling depressed, down, irritable, or grouchy. Only the stressful interaction was used in the current study due to the increased likelihood that the parenting behaviors of interest would be evident in this second interaction.

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The *Iowa Family Interaction Rating Scales* (IFIRS; Melby et al., 1998) are used in the RHC study to code parenting behavior. The IFIRS is a global observational coding system designed to measure the quality of family interactions. Evaluation of interactions is based on verbal and nonverbal behaviors, the context in which the behaviors occur, and the affect displayed by the family members engaged in the behaviors. For the majority of the IFIRS behavior codes, ratings are based on both frequency and intensity. Therefore, one intense example of a behavior may receive the same rating as several low intensity behaviors. The system is not exhaustive, in that some behaviors do not fit into any code. Additionally, each code is not exclusive, in that one behavior may fit into several separate codes.

The IFIRS system consists of 60 individual codes, each of which has a detailed definition and clarifications regarding its use. Typically, based on the specific aims of a research project, investigators select only some of the codes for use, since use of all 60 codes would be burdensome and unnecessary for any given project. In the RHC study, parents are assessed on 22 codes and children on 14. Of the 22 parent codes, the following four codes were used in the current study as measures of specific parenting behaviors, as they parallel the parenting behaviors identified by Lovejoy et al. (2000) as characteristic of parents with depression and by McLeod et al. (2007b) as being implicated in the development of anxiety in children: 1) *hostility* (the extent to which hostile, angry, critical, disapproving, rejecting, or contemptuous behavior is directed toward the child); 2) *intrusiveness* (the extent to which the parent is domineering and over-controlling during interactions with the child); 3) *neglect/ distancing* (the degree to which the parent minimizes the amount of time, contact, or effort he/she expends on the child, including ignoring or psychological/physical distancing in the interaction situation; the parenting behaviors captured by this parent code resemble the disengagement/ withdrawal variable

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identified by Lovejoy et al.); and 4) *warmth/ support* (expression of care, concern, support, or encouragement toward the child). Two of these codes (i.e., intrusiveness and neglect/ distancing) permit the observer to base scores on information reported during the family discussion about the parent's behavior toward the child outside of the interaction, as well as on behavior actually observed during the interaction task. Each individual code is rated on a scale from 1 to 9, with every odd level having a specific definition. Table 3 provides general definitions of the codes used in the current study as they appear in the IFIRS coding manual. Additional behavioral indicators are provided in the manual for each code, allowing trained observers to follow specific coding criteria rather than forcing them to rely on assumption, intuition, and subjective judgment.

Of note, McLeod et al. (2007b) found a strong association between parental autonomy-granting and child anxiety. However, autonomy-granting was not identified by Lovejoy et al. (2000) as a parenting behavior characteristic of parents with depression. Moreover, intrusiveness represents the failure to encourage autonomy (see Table 3). For example, the definition of McLeod and colleagues' definition of over-involvement, a term similar to intrusiveness, includes "parental interference with children's age-normative autonomy" (p. 161). Given that Lovejoy et al. did not identify autonomy-granting, or lack thereof, as a characteristic behavior of parents with depression, and that interference with autonomy is included in both the definition of over-involvement by McLeod et al. and the definition of intrusiveness in the IFIRS coding system, autonomy-granting was not examined as a separate construct in the current study.

The psychometric properties of the IFIRS are strong and have been established in studies of families with children ranging in age from nine to adulthood (Melby & Conger, 2001).

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Table 3: Description of IFIRS codes proposed for use in the current study as measures of parent behavior

Behavior Code	Description
Hostility	This scale measures the degree to which the focal (i.e., parent) displays hostile, angry, critical, disapproving, and/or rejecting behavior toward the behavior, appearance, and/or personal characteristics of another person involved in the interaction (i.e., child). The following behaviors are taken into account in coding: *nonverbal communication*, such as angry or contemptuous facial expressions and menacing/threatening body posture; *emotional expression*, such as irritable, sarcastic, or curt tones of voice or shouting, or rejection such as actively ignoring the other, showing contempt or disgust for the other or the other's behavior, or denying the other's needs; and the *content* of the statements themselves, such as complaints about the other or denigrating or critical remarks (e.g., "You don't know anything" or "You could never manage that"). Two people can disagree without be hostile. To be hostile, disagreements must include some element of negative affect such as derogation, disapproval, blame, ridicule, etc.
Intrusiveness	This scale assesses intrusive and over-controlling behaviors that are parent-centered rather than child-centered. In structured tasks, the behavior may be manifested by extreme concern about completing the task. Task completion appears more important than promoting the child's autonomy and allowing the child to explore and set the pace for the task. Regardless of affect or tone, the parent is over-involved in fulfilling task activities.
Neglect/distancing	This scale measures the degree to which the parent is uncaring, apathetic, uninvolved, ignoring, aloof, unresponsive, self-focused, and/or adult-oriented. The scale assesses the degree to which the parent displays behavior that minimizes the amount of time, contact, or effort he/she has to expend on the child. The parent seems focused on his/her needs to the exclusion of the legitimate needs of the child. Although involved in the task, the parent may be dismissive of the child's feelings and/or concerns. The parent seems to promote psychological or physical distance between self and child by making it difficult for the child to feel validated. The parent is disengaged and/or withdrawn from the child. Alternatively, the parent may behave in a hostile manner toward the child in order to minimize the parent's involvement with the child.
Warmth/support	The scale measures the degree to which the focal (i.e., parent) expresses liking, appreciation, praise, care, concern, or support for the other person (i.e., child). Three types of behavior are taken into account: *nonverbal communication*, such as affectionate touching, kissing, and loving smiles; *supportiveness*, such as showing concern for the other's welfare, offering encouragement, and praise; and *content*, such as statements of affirmation, empathy, liking, appreciation, care, and concern, Affect and nonverbal behaviors are more heavily weighted than content of statements.

The individual codes have been validated against self-report measures, as well as reports from other family members. Validity has been assessed using correlation and confirmatory factor analyses. Interobserver reliability has been assessed using intraclass correlations, which have ranged from .55 to .85 for any given code. The overall evidence of the IFIRS system's validity suggests that it is a useful tool for studying social processes within families (Melby & Conger, 2001).

Observational coders for the RHC study include trained graduate and undergraduate students who do not interact in any formal way with families being videotaped, thus minimizing bias while coding. The complexity of the IFIRS macro-level coding system requires observers to undergo extensive training involving memorization of the coding manual, followed by a written exam. This exam requires coders to define the codes with at least 90% accuracy. In addition, coders must pass viewing tests in which 80% of their scores are within one point of the criterion scores. Once trainees pass the written test and achieve 80% reliability on at least three viewing tests, they are qualified to begin coding videotapes.

Each interaction is viewed five times. During the first viewing, the coder does not score behaviors, but simply watches the overall interaction in order to see the content of the tape in its entirety. The coder then randomly selects either the parent or child as the first individual to be scored, and views the recording focusing only on that focal and recording specific behaviors under each code being assessed. Scores range from 1 to 9, with 1 = not at all characteristic, 3 = minimally characteristic, 5 = somewhat characteristic, 7 = moderately characteristic, and 9 = mainly characteristic. The coder then repeats the process for the second focal. In order to check reliability, each tape is double coded. Once a tape has been double coded, the reliability between the two coders is determined using percent agreement. For example, of the 22 parent

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codes, if the two coders have scores within one point of each other on 20 of these codes, then the inter-rater reliability would be 91%. Codes that are more than one point different (e.g., one coder rates Hostility a 3, whereas the second coder rates Hostility a 5) are consensus coded by the two observers (i.e., the coders are required to come to an agreement about how to score the code).

The *Alabama Parenting Questionnaire* (APQ; Frick, 1991), a 42-item measure of parenting style, was used in secondary analyses to examine parent and child reports of parenting behavior. The APQ consists of 35 items (Shelton, Frick, & Wootton, 1996) and yields three parenting constructs based on an empirically derived three-factor model (Hinshaw et al., 2000): Positive Involvement (16 items; e.g., praise, attends school meetings, helps with homework), Negative/ Ineffective Discipline (11 items; e.g., threatens to punish but doesn't, spanks child, lets child out of punishment early), and Deficient Monitoring (8 items; e.g., child out with friends unknown to you, child comes home one or more hours late). Items are rated on a 5 point scale to indicate how often the specific parenting behavior is performed in the home context, ranging from 1 (never) to 5 (always). As the Positive Involvement construct is the only one that maps onto any of the specific parenting behaviors examined in the current study (i.e., warmth), only the Positive Involvement subscale was examined in secondary analyses. Both parent and child reports on the APQ were utilized in the current study to reduce inflated associations due to shared method variance and in line with literature demonstrating only moderate correlations between parent- and child-report (e.g., Jacob, Moser, Windle, Loeber, & Stouthamer-Loeber, 2000). Internal consistencies for both the parent-report ($\alpha = .90$) and child-report ($\alpha = .93$) forms for the current sample were high.

2.3.5. Child anxiety

Three measures of child anxiety were examined in the current study. The *Kiddie Schedule for Affective Disorders and Schizophrenia for School-Aged Children – Present and Lifetime Version* (K-SADS-PL; Kaufman et al., 1997) was used in the RHC study at the baseline time point to assess for child psychopathology for purposes of study inclusion and exclusion. The K-SADS-PL is a semi-structured diagnostic interview designed to assess child and adolescent current and past psychopathology. When all screen items and follow-up modules are administered, the K-SADS-PL is capable of assessing 32 DSM-IV Axis I diagnoses. In coding current disorders, symptoms are rated for the most severe period within the episode that meets the duration requirement for the disorder (e.g., at least 4 weeks for separation anxiety disorder). Parent and child are separately interviewed regarding the child's symptoms, after which summary scores are calculated. The majority of the K-SADS-PL items are scored from '0' to '3', with '0' indicating no information available, '1' indicating that the symptom is not present, '2' indicating a subthreshold level of symptomatology, and '3' indicating a threshold level of symptomatology. The summary score represents the highest rating for each symptom (regardless of child or parent report) and is used in the symptom count for diagnostic requirements. The K-SADS-PL has demonstrated good test-retest reliability over a 1 to 5 week period (e.g., current MDD, $\kappa=.90$; current conduct disorder, $\kappa=.74$), and well-supported concurrent validity with CBCL/6-18 broadband and syndrome scale scores (e.g., Kaufman et al., 1997).

The complete K-SADS-PL interview utilized in the RHC study consists of an introductory interview (used to establish rapport and collect information about school functioning, peer and family relations, and hobbies), a screen interview (used to streamline the assessment by using

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cardinal symptoms for each disorder and allowing skip-outs if none of the symptoms in the screen meet threshold criteria), and diagnostic supplements (used when indicated by threshold criteria being met in the screen to fully assess symptoms required for a diagnosis). For the current study, the K-SADS-PL modules of interest for purposes of inclusion and exclusion were current depression, current conduct disorder, and current alcohol and substance abuse and dependence, as these diagnoses either excluded children temporarily (i.e., current depression, current alcohol or substance abuse or dependence) or permanently (i.e., current conduct disorder).

The K-SADS-PL was also used in secondary analyses in the current study to indicate presence or absence of a child anxiety disorder. Specifically, the version of the K-SADS-PL used in the RHC study assesses for the following five anxiety disorders: 1) separation anxiety disorder, 2) social anxiety disorder, 3) generalized anxiety disorder, 4) panic disorder, and 5) agoraphobia. Meeting criteria for any of these five anxiety disorders according to parent or child report was taken to indicate that the presence of a current anxiety disorder.

The DSM-Oriented Anxiety Problems scale from the *Child Behavior Checklist for Ages 6-18* (CBCL/6-18; Achenbach & Rescorla, 2001) was used in the current study as a parent-report measure of current child anxiety symptoms. The CBCL/6-18 is a 118-item, parent report measure designed to assess child behavioral and emotional problems. Each item is rated according to the extent that it was true for the child/adolescent within the last six months using the following scale: 0 = not true; 1 = somewhat or sometimes true; and 2 = very or often true. The CBCL/6-18 yields a composite Total Problems score, Internalizing and Externalizing Problems broadband scores, and Syndrome and DSM-Oriented Scale scores. Although the DSM-Oriented Scales are not directly equivalent to *Diagnostic and Statistical Manual of Mental Disorders, 4th*

Edition diagnoses, they were developed to reflect symptoms of DSM-IV diagnostic categories.

The DSM-Oriented Anxiety Problems scale items are thought to reflect criteria from the

generalized anxiety disorder, separation anxiety disorder, and specific phobia DSM-IV diagnostic

categories. The scale is comprised of the following items: "too dependent on adults," "afraid of

certain animals, situations, or places, other than school," "afraid of going to school," "nervous or

tense," "too fearful or anxious," and "worries a lot". Examination of T-scores from the CBCL/6-

18 facilitates the comparison of offspring anxiety levels to a normative sample. However, T-

scores are truncated at the non-deviant end for DSM-Oriented Scales. Therefore, in line with

the recommendations for use in research by the authors of the measure, raw scores were used

in all data analyses to account for the full range of variability of scores on these scales.

Extensive data regarding the reliability and validity of the CBCL/6-18 indicate excellent internal

consistency ($\alpha = .97$) and one-week test-retest reliability ($r = .94$) for the Total Problems scale

(Achenbach & Rescorla, 2001). Internal consistency ($\alpha = .72$) and test-retest reliability ($r = .80$)

estimates for the Anxiety Problems scale are also good. Achenbach and Rescorla reported the

Anxiety Problems scale to be significantly correlated with both the DSM-IV Checklist ($r = .43$) and

diagnoses by clinicians based on clinical evaluation ($r = .45$). Internal consistency for the current

sample was low ($\alpha = .57$).

The DSM-Oriented Anxiety Problems scale from the *Youth Self-Report for Ages 11-18*

(YSR/11-18; Achenbach & Rescorla, 2001) was used in the current study as a self-report measure

of current child anxiety symptoms. The items on the YSR/11-18 generally parallel those of the

CBCL/6-18. Youths rate themselves on how true each item was for them within the last six

months using the same three-point response scale as for the CBCL/6-18. Like the CBCL/6-18, the

YSR/6-18 yields a Total Problems score, Internalizing and Externalizing Problems broadband

scores, and Syndrome and DSM-Oriented Scale scores. The DSM-Oriented Anxiety Problems scale includes parallel items to those in the same scale of the CBCL/6-18. As with the CBCL/6-18, T-scores are truncated at the non-deviant end for DSM-Oriented Scales. In addition, normative data are not available for use with youth younger than 11 years of age. Therefore, raw scores were used in all analyses to account for the full range of variability of scores on these scales. Extensive data regarding the reliability and validity of the YSR/11-18 indicate excellent internal consistency (α = .95) and one-week test-retest reliability (r = .87) for the Total Problems scale (Achenbach & Rescorla, 2001). Internal consistency (α = .67) and test-retest reliability (r = .68) estimates for the Anxiety Problems scale have also been shown to be acceptable. Internal consistency for the current sample was adequate (α = .66).

Researchers have noted the value of incorporating data from multiple reporters, who may each provide a unique yet valid perspective on the child's symptomatology and functioning (Achenbach & Rescorla, 2001; Kolko & Kazdin, 1993). However, numerous studies have indicated low agreement among reporters for child anxiety symptoms (e.g., Benjamin, Costello, & Warren, 1990; Klein, 1991; Manassis, Tannock, Mendlowitz, Laslo, & Masellis, 1997; Mesman & Koot, 2000a, 2000b; Schniering et al., 2000). Consistent with the findings from these studies, cross-informant agreement for the current sample on the CBCL/6-18 and YSR/6-18 Anxiety Problems scales was relatively low (r = .38). Therefore, raw scores from the DSM-Oriented Anxiety Problems scales from the CBCL/6-18 and YSR/11-18 were examined separately rather than the alternative of averaging the parent and child scores to create a single score.

2.3.6. Child depressive symptoms

The DSM-Oriented Affective Problems scale from the *Child Behavior Checklist for Ages 6-18* (CBCL/6-18; Achenbach & Rescorla, 2001) was used in the current study as a parent-report

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measure of current child depressive symptoms. Please see the description of the CBCL/6-18 in the section above on the DSM-Oriented Anxiety Problems scale for information about the measure. The DSM-Oriented Affective Problems scale items are thought to reflect criteria from the Major Depressive Disorder and Dysthymia diagnostic categories of the DSM-IV. The scale is comprised of the following items: "enjoys little," "cries a lot," "deliberately tries to hurt self," "does not eat well," "feels worthless or inferior," "feels too guilty," "overtired," "sleeps less than most kids," "sleeps more than most kids," "talks of suicide," "has trouble sleeping," "does not have much energy," and "is unhappy, sad, or depressed". As with the DSM-Oriented Anxiety Problems scale, examination of T-scores facilitates the comparison of offspring anxiety levels to a normative sample. However, T-scores are truncated at the non-deviant end for DSM-Oriented Scales. Therefore, in line with the recommendations for use in research by the authors of the measure, raw scores were used in all data analyses to account for the full range of variability of scores on these scales. Internal consistency (α = .82) and test-retest reliability (r = .84) estimates for the Affective Problems scale are good. Achenbach and Rescorla (2001) reported the Affective Problems scale to be significantly correlated with both the DSM-IV Checklist (r = .63) and diagnoses by clinicians based on clinical evaluation (r = .39). Internal consistency for the current sample was adequate (α = .66).

The DSM-Oriented Affective Problems scale from the *Youth Self-Report for Ages 11-18* (YSR/11-18; Achenbach & Rescorla, 2001) was used in the current study as a self-report measure of current child depressive symptoms. Please see the description of the YSR/11-18 in the section above on the DSM-Oriented Anxiety Problems scale for information about the measure. The DSM-Oriented Affective Problems scale includes parallel items to those in the same scale of the CBCL/6-18. As with the CBCL/6-18, T-scores are truncated at the non-deviant end for DSM-

Oriented Scales. In addition, normative data are not available for use with youth younger than 11 years of age. Therefore, raw scores were used in all analyses to account for the full range of variability of scores on these scales. Internal consistency (α = .81) and test-retest reliability (r = .80) estimates for the Affective Problems scale are good. Internal consistency for the current sample was also good (α = .79).

As with the DSM-Oriented Anxiety Problems scales, cross-informant agreement for the current sample on the CBCL/6-18 and YSR/6-18 Affective Problems scales was relatively low (r = .35). Therefore, raw scores from the DSM-Oriented Affective Problems scales from the CBCL/6-18 and YSR/11-18 were examined separately rather than the alternative of averaging the parent and child scores to create a single score.

2.4. Interviewer Training

Interviewers underwent approximately 25 hours of training prior to administering the SCID-I/P (First et al., 2001) and the K-SADS-PL (Kaufman et al., 1996). Training included the following steps: 1) participating in a detailed overview of both instruments followed by practice with a previously trained and reliable interviewer; 2) listening to and scoring a previously administered interview; 3) resolving discrepancies from the original scoring of that interview with a master trainer; 4) completing a reliability check, achieved by administering an interview with the master trainer (SCID-I/P) or a community parent and child (K-SADS-PL); 5) resolving discrepancies through discussion between the interviewer and master trainer; and 6) participating in periodic mandatory interviewer refresher meetings to prevent interviewer drift. Reliability checks, conducted in approximately 20% of the interviews, resulted in adequate agreement. For example, for each of the SCID-I/P diagnostic categories of interest, the percent

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agreement was .90 or higher (100% in 55% of the categories). The kappa coefficient was above .60 for all primary categories of interest.

2.5. Procedure

All prospective target parents were initially screened via diagnostic telephone interview for symptoms of current or previous depression, lifetime history of bipolar I and II, lifetime schizophrenia, and current alcohol and substance abuse and dependence. Diagnoses were made using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I/P: First et al., 2001). In addition, parents participating in the telephone screen were asked to report on participating offspring's current depression (i.e., symptoms occurring within the past month), current conduct disorder, current alcohol and substance use, lifetime bipolar disorder, lifetime schizophrenia, and pervasive developmental disorder. Child and adolescent diagnoses were made using relevant sections of the Schedule for Affective Disorders and Schizophrenia for School-Aged Children – Present and Lifetime Version (K-SADS-PL; Kaufman et al., 1997), a semi-structured diagnostic interview based on the DSM-IV.

Families meeting initial eligibility criteria based on the telephone screen were invited to participate in a more comprehensive in-person assessment at either the University of Vermont or Vanderbilt University. This assessment included administration of the SCID-I/P and K-SADS-PL interviews to make a final decision regarding eligibility; these interviews also served as measures of parent and child symptomatology at baseline. The baseline assessment also included administration of the parent-child interaction tasks. As described previously, each parent-child dyad was asked to participate in two 15-minute interactions, one in which they discussed a recent pleasant activity in which they engaged together and another in which they discussed a recent situation that was stressful for them as a result of the target parent's

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depression. Lastly, target parents and all participating children were asked to complete a battery of paper-and-pencil or on-line questionnaires; these questionnaires were completed either during the assessment session or at home within one week of the session. All baseline procedures were repeated for each participating child, and parents and children were compensated $40 each for their participation.

CHAPTER 3: RESULTS

3.1. Preliminary Analyses

Descriptive statistics were computed for all primary and control variables and are

presented in Table 4. The mean BDI-II score for target parents was 19.34 (SD = 11.91), indicating

that parents, on average, reported *moderate* levels of depressive symptoms. The mean BAI

score for target parents was 11.90 (SD = 10.60), indicating that parents, on average, reported

mild levels of anxiety symptoms. With regard to observed parenting behaviors, which have a

possible score range of one to nine, the mean score for parental hostility was 3.82 (SD = 2.04),

indicating that parents, on average, were *minimally* to *somewhat* hostile in their interactions

with their children. The mean score for parental warmth was 4.66 (SD = 1.86), indicating that

parents, on average, were *somewhat* warm in their interactions with their children. Finally, the

mean scores for parental neglect/ distancing and intrusiveness were 2.89 (SD = 1.87) and 3.07

(SD = 1.84), respectively, indicating that parents, on average, were *minimally* intrusive and

withdrawn in their interactions with their children. Thus, in general, target parents exhibited

relatively low levels of all of the observed parenting behaviors of interest. Mean scores for both

parent-report (T-score = 57.98) and child-report (T-score = 55.36) of child anxiety problems on

the CBCL/6-18 and YSR/11-18, respectively, fell in the normative range. Similarly, mean scores

for both parent-report (T-score = 60.47) and child-report (T-score = 56.6) of child affective

problems on the CBCL/6-18 and YSR/11-18, respectively, fell in the normative range. Thus, both

parent- and child-reported child anxiety symptoms generally fell in the normative range for the

current sample. Sixteen percent (n = 21) of children in the current sample met criteria for at

least one anxiety disorder based on the combined reports of parents and children. Specifically,

six children met criteria for current separation anxiety disorder, nine children met criteria for

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Table 4: Descriptive data for primary variables and control variables

	M	SD	%
Predictor Variable			
BDI-II-II[1]	19.34	11.91	
Mediator Variables			
Hostility[2]	3.82	2.04	
Warmth[2]	4.66	1.86	
Neglect/Distancing[2]	2.89	1.84	
Intrusiveness[2]	3.07	1.87	
Criterion Variables			
CBCL Anxiety Problems Raw Score[3]	2.48	2.00	
CBCL Anxiety Problems T-Score[4]	57.98 (N = 129)	7.27	
YSR Anxiety Problems Raw Score[3]	2.89	2.31	
YSR Anxiety Problems T-Score[4]	55.36 (N = 130)	6.64	
KSADS Anxiety Diagnosis			16
Control Variables			
BAI[5]	11.90	10.60	
CBCL Affective Problems Raw Score[6]	3.89	2.87	
CBCL Affective Problems T-Score[4]	60.47 (N = 129)	7.34	
YSR Affective Problems Raw Score[6]	4.89	3.97	
YSR Affective Problems T-Score[4]	56.60 (N = 130)	7.49	

Note. N = 131 except where noted; BDI-II = Beck Depression Inventory-II, BAI = Beck Anxiety Inventory, CBCL = Child Behavior Checklist, YSR = Youth Self-Report, KSADS = Kiddie Schedule for Affective Disorders and Schizophrenia; [1]BDI scale range = 0-63; [2]Parenting behavior scales range = 1-9; [3]CBCL/YSR Anxiety Problems subscale range = 0-12; [4]CBCL/YSR T-Scores above 69 considered clinically significant; [5]BAI scale range = 0-63; [6]CBCL/YSR Affective Problems subscale range = 0-26.

current social phobia, and seven children met criteria for current generalized anxiety disorder; no children met criteria for current panic disorder or agoraphobia.

Zero-order correlations were computed to examine the relations between theoretically-relevant *dimensional* demographic variables (i.e., target parent socioeconomic status and child age), the primary variables of interest (i.e., parental depressive symptoms, observed parenting behaviors, and child anxiety symptoms), and the control variables (i.e., parental anxiety and child depression). Because of the nested nature of the data, correlations were computed after individual cases had been weighted. For example, when correlating target parent socioeconomic status and child anxiety scores in a family with two participating children, the value for socioeconomic status was weighted at one-half. Table 5 presents zero-order correlations for the dimensional demographic variables, the primary variables of interest, and the control variables. One-way analyses of variance were computed to examine the relations between theoretically-relevant *categorical* demographic variables (i.e., target parent gender, race, and marital status and child gender) and the outcome variables of interest. Again, these analyses were conducted after individual cases had been weighted, to account for the nested nature of the data. Table 6 presents data from the one-way analyses of variance. The following three paragraphs describe the findings presented in Tables 5 and 6.

Prior research suggests that a number of demographic variables may be associated with the parenting behaviors of parents with depression (Lovejoy et al., 2000), as well as with child anxiety outcomes (Weiss & Last, 2001) and child development more generally (Gottfried, Gottfried, Bathurst, Guerin, Parramore, 2003). Therefore, in the current study, relations were assessed between selected demographic variables and the primary outcome variables of

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Table 5: Zero-order correlations between dimensional demographic variables, primary variables, and control variables

	1	2	3	4	5	6	7	8	9	10	11	12
Demographics												
1. TP Socioeconomic Status	--	-.06	-.29**	-.23*	.10	-.15	-.29**	-.27**	-.23*	-.30**	-.23*	-.19
2. Child Age		--	.09	.19	-.16	.07	.06	-.07	.04	.08	.20*	.13
Predictor Variable												
3. BDI-II-II			--	.15	-.17	.16	.19	.12	.14	.61**	.26**	.15
Mediator Variables												
4. Hostility				--	-.49**	.31**	.50**	.15	.20*	.08	.24*	.20*
5. Warmth					--	-.49**	-.26*	.03	-.19	-.05	-.11	-.22*
6. Neglect/Distancing						--	.09	.13	.06	.12	.19	.09
7. Intrusiveness							--	.11	.22*	.15	.17	.12
Criterion Variables												
8. CBCL Anxiety Problems								--	.38**	.26**	.40**	.14
9. YSR Anxiety Problems									--	.17	.34**	.61**
Control Variables												
10. BAI										--	.23*	.02
11. CBCL Affective Problems											--	.35**
12. YSR Affective Problems												--

Note. N = 131; *p ≤ .05, **p ≤ .01; BDI-II-II = Beck Depression Inventory-II, BAI = Beck Anxiety Inventory, CBCL = Child Behavior Checklist, YSR = Youth Self-Report.

Table 6: One-way analyses of variance for categorical demographic variables and primary variables

	df	MS	F	p
Hostility				
TP Gender	1, 97	8.09	2.03	.16
TP Race	1, 97	19.31	5.00	.03*
TP Marital Status	1, 97	5.92	1.48	.23
Child Gender	1, 97	1.80	.44	.51
Warmth				
TP Gender	1, 97	.65	.20	.66
TP Race	1, 97	46.94	16.48	.00**
TP Marital Status	1, 97	1.51	.46	.50
Child Gender	1, 97	2.46	.75	.39
Neglect/Distancing				
TP Gender	1, 97	.94	.28	.60
TP Race	1, 97	10.83	3.23	.07
TP Marital Status	1, 97	2.33	.69	.41
Child Gender	1, 97	.24	.07	.79
Intrusiveness				
TP Gender	1, 97	3.82	1.17	.28
TP Race	1, 97	.78	.24	.63
TP Marital Status	1, 97	16.34	5.20	.03*
Child Gender	1, 97	2.31	.70	.40
CBCL Anxiety Problems				
TP Gender	1, 97	8.50	2.17	.14
TP Race	1, 97	.31	.08	.78
TP Marital Status	1, 97	18.88	4.95	.03*
Child Gender	1, 97	13.98	3.61	.06
YSR Anxiety Problems				
TP Gender	1, 97	4.71	.88	.35
TP Race	1, 97	8.41	1.59	.21
TP Marital Status	1, 97	20.88	4.05	.05*
Child Gender	1, 97	14.60	2.80	.10

Note. $N = 131$; *$p \leq .05$, **$p \leq .01$; CBCL = Child Behavior Checklist, YSR = Youth Self-Report.

interest. When significant relations with the demographic variables were found, these variables were controlled in subsequent analyses. Of note, parent education level is often considered a family variable and combined with household income to form a measure of family socioeconomic status (SES) (Ensminger & Fothergill, 2003). In the current study, because target parent education and household income were significantly and highly correlated ($r = .49$, $p <$ .01), they were standardized and summed to create a composite variable reflecting family SES. This continuous measure of SES was then correlated with the study variables of interest. Two other demographic variables were also modified for data analytic purposes. Specifically, target parent marital status was transformed into a two-category variable reflecting whether or not a second parent or partner lives in the home. Similarly, due to the low frequency of target parents identifying with a race other than Caucasian, target parent race/ ethnicity was transformed into a two-category variable indicating whether or not the target parent was Caucasian.

Results indicate that target parent socioeconomic status was negatively associated with parental hostility and intrusiveness, as well as with both parent report of child anxiety problems on the CBCL/6-18 and child self-report of anxiety problems on the YSR/11-18; specifically, higher levels of socioeconomic status were associated with lower levels of parental hostility and intrusiveness and lower levels of parent- and child-reported anxiety. Target parent race was associated with parental hostility and warmth; specifically, higher levels of hostility and lower levels of warmth were observed for parents who identified with a race/ ethnicity other than Caucasian. Target parent marital status was associated with parental intrusiveness, as well as with both parent report of child anxiety problems on the CBCL/6-18 and child self-report of anxiety problems on the YSR/11-18; specifically, higher levels of intrusiveness were observed for

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parents who were not married or living with a partner. Similarly, higher levels of child anxiety were reported by both parents and children when parents were not married or living with a partner. Target parent gender and child age and gender were not significantly associated with any parenting behavior or child anxiety outcome variable.

The following associations were found between the primary variables of interest (i.e., parental depressive symptoms, the four observed parenting behaviors, and child anxiety symptoms). Parental depressive symptoms were not significantly associated with any of the four observed parenting behaviors or with parent or child report of child anxiety symptoms. Parental hostility and intrusiveness were both positively associated with child self-report, but not parent report, of anxiety symptoms; specifically, higher levels of hostility and intrusiveness were associated with higher levels of child-reported anxiety symptoms. In contrast, parental warmth and neglect/ distancing were not associated with parent or child report of child anxiety symptoms.

With regard to the parental anxiety and child depression control variables, parental depressive symptoms were positively associated with both parental anxiety symptoms and parent report of child depressive symptoms; as expected, higher levels of parental depressive symptoms were associated with higher levels of parental anxiety symptoms and parent-reported child depressive symptoms. Parental depressive symptoms were not significantly associated with child self-report of depressive symptoms. Additionally, parental hostility was significantly associated with both parent and child report of child depressive symptoms, with higher levels of hostility being associated with higher levels of child depressive symptoms. Parental warmth was also significantly associated with child self-report of depressive symptoms, with higher levels of warmth being associated with lower levels of child depressive symptoms.

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The parental anxiety symptoms control variable was not significantly associated with any of the observed parenting behaviors.

Due to the relatively low internal consistencies found in the current study for the Anxiety Problems scale of the CBCL/6-18 and YSR/11-18, additional preliminary analyses were conducted to examine the association of parental depressive symptoms and child anxiety symptoms using an anxiety scale consisting of more items. In a recent study examining the development and maintenance of anxiety symptoms from infancy through adolescence, Bosquet and Egeland (2006) created a broader anxiety scale from all items on the CBCL that appeared to tap anxiety: fears he or she might think or do something bad; feels he or she has to be perfect; feels others are out to get him or her; is nervous, high-strung, or tense; is too fearful or anxious; is self-conscious or easily embarrassed; is suspicious; worries; fears going to school; fears certain animals, situations, or places other than school; cannot get mind off certain thoughts; and repeats acts over and over. Thus, the anxiety scale used by Bosquet and Egeland consisted of a total of 12 items, double the number of items that comprise the Anxiety Problems scale of the CBCL/6-18 and YSR/11-18. The 12 items identified by Bosquet and Egeland, along with one additional item that is included in the Anxiety Problems scale as a measure of separation anxiety (i.e., is too dependent on adults), were examined in preliminary regression analyses in the current study to determine if the association between parental depressive symptoms and child anxiety symptoms might change with a longer, and potentially more reliable, measure of child anxiety symptoms. Results from these initial regression analyses were similar to those found with the more established Anxiety Problems scale. Thus, a decision was made to use the Anxiety Problems scale in primary analyses despite its short length and relatively low internal consistency reliability.

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3.2. Primary Analyses

3.2.1. Linear Mixed Models Analyses

Because multiple children from the same family were included in data analyses, Linear

Mixed Models Analyses (LMM) were used in SPSS to examine the relations between the primary

variables of interest. LMM accounts for the correlation of data within families by assuming a

compound symmetry covariance structure and using an iterative, or repeated measures,

procedure to estimate parameters of the model. In this way, mixed model analyses account for

the assumed correlations between parental outcome measurements on children in the same

family (A. Howard, personal communication, May 2, 2007). Of note, two different ways of

specifying the model were compared prior to selecting the one used here. Specifically, the

repeated procedure, which treats multiple children per family as a repeated measure, was

compared to a procedure which treats multiple children per family as a random effect.

However, because the model parameter estimates were similar regardless of the procedure

used, a decision was made to use the repeated procedure in all LMM analyses.

In a linear mixed-effects model, responses from a subject are considered to be the sum

of fixed- and random-effects. Effects of the independent variables (i.e., parental depressive

symptoms and observed parenting behaviors) on the dependent variables (i.e., child anxiety

symptoms) are considered fixed. Fixed effects, in other words, are represented by the

regression coefficients for the effects of the independent variables on the dependent variables.

In contrast, effects associated with the sampling procedure (i.e., sampling data from multiple

children within the same family) are considered random. Although the fixed-effects are typically

of primary interest, it is necessary to account for the random-effects of the data, which

represent random deviations for a given subject or cluster from the overall fixed effects (West, Welch, & Galecki, 2008).

The linear mixed-effects procedure estimates the fixed- and random-effects in the model according to the multiple levels found in the data. Level 1 represents observations at the individual level (i.e., observations of parenting behaviors and parent and child-reports of child anxiety). Level 2 represents clusters of units (i.e., families) within the dataset. In the case of the current two-level clustered data set, linear mixed-effects modeling nested children from the same family into a single cluster. In the current model, the independent variables (i.e., parental depressive symptoms and observed parenting behaviors) served as the fixed factors and produced regression coefficients representing the associations with child anxiety symptoms. Family size served as the random factor in the model; the random-effects associated with family size were accounted for in the linear mixed-effects model, thereby controlling for the variability in the dependent variable associated with the inclusion of multiple children per family (West et al., 2008).

3.2.2. Regression models

Baron and Kenny (1986) delineate three data-analytic steps for testing mediation via a series of regression models. Specifically, a test of the linkages of the mediation models entails: 1) regressing the dependent variable on the independent variable; 2) regressing the mediator on the independent variable; and 3) regressing the dependent variable on the independent variable and the proposed mediator simultaneously. To establish mediation, the independent variable must affect the dependent variable in the first equation, the independent variable must affect the mediator in the second equation, and the mediator must affect the dependent variable in the third equation. If these conditions all hold in the predicted direction, then the effect of the

independent variable on the dependent variable must be less in the third equation than in the second. Theoretically, perfect mediation holds if the independent variable has no effect when the mediator is controlled in the third equation.

3.2.3. Analyses without controls for parental anxiety and child depression

Following these steps, the analyses delineated in the following paragraphs were conducted separately with each of the four parenting behaviors of interest (i.e., hostility, intrusiveness, withdrawal, and warmth) and parent- and child-reports of child anxiety symptoms. Although not required to test statistical mediation according to Baron and Kenny (1986), analyses regressing the dependent variable on the mediator variable were performed to examine the association of these variables in the current sample. The third step of Baron and Kenny's statistical procedure for testing mediation (i.e., regressing the dependent variable on the independent variable and the proposed mediator simultaneously, as in Hypothesis 4 below) was not performed, as significant regressions in both of the first two steps were not found. Thus, a total of 14 sets of primary LMM analyses were conducted.

Hypothesis 1: Current parental depressive symptoms will be significantly associated with parent- and child-reported child anxiety symptoms. To test Hypothesis 1, two sets of LMM analyses were conducted in which parent and child reports of child anxiety symptoms were regressed on current parental depressive symptoms after controlling for relevant demographic variables. As reported in Table 7, after controlling for target parent marital status and target parent socioeconomic status, parental depressive symptoms were not a significant predictor of parent-reported child anxiety symptoms. As reported in Table 8, after controlling for target parent race and target parent socioeconomic status, parental depressive symptoms were not a

Table 7: Parental depressive symptoms predicting parent-reported child anxiety symptoms

	F (each predictor)	β	SE	t	p
Dependent Variable: CBCL Anxiety Problems					
Blocks					
1. TP Marital Status	1.25	0.11	0.40	1.12	ns
TP Socioeconomic Status	5.05	-0.22	0.11	-2.25	≤.05
2. BDI-II	0.00	0.01	0.02	0.06	ns

Note. N = 104; BDI-II-II = Beck Depression Inventory-II.

Table 8: Parental depressive symptoms predicting child self-report of anxiety symptoms

	F (each predictor)	β	SE	t	p
Dependent Variable: YSR Anxiety Problems					
Blocks					
1. TP Race	0.76	0.07	0.47	0.87	ns
TP Socioeconomic Status	2.56	0.10	0.14	-1.60	ns
2. BDI-II	0.30	0.09	0.02	0.55	ns

Note. N = 104; BDI-II-II = Beck Depression Inventory-II.

significant predictor of child self-reported anxiety symptoms.   Thus, Hypothesis 1, or step one of

Baron and Kenny's (1986) three steps for testing mediation models, was not supported.

Hypothesis 2: *Current parental depressive symptoms will be significantly associated with*

observed parental hostility, intrusiveness, withdrawal, and warmth. To test Hypothesis 2, four

sets of LMM analyses were conducted in which parental hostility, intrusiveness, withdrawal, and

warmth were separately regressed on current parental depressive symptoms after controlling

for relevant demographic variables. As reported in Table 9, after controlling for target parent

race and target parent socioeconomic status, parental depressive symptoms were not a

significant predictor of observed parental hostility. Similarly, as reported in Table 10, after

controlling for target parent race, parental depressive symptoms were not a significant predictor

of observed parental warmth. As reported in Table 11, parental depressive symptoms *were* a

significant predictor of observed parental neglect/ distancing; specifically, as hypothesized,

higher levels of parental depressive symptoms were associated with higher levels of neglect/

distancing, or withdrawal, by parents in the interaction task. As reported in Table 12, after

controlling for target parent marital status and target parent socioeconomic status, parental

depressive symptoms were not a significant predictor of observed parental intrusiveness. Thus,

Hypothesis 2, or step two of Baron and Kenny's (1986) steps for testing mediation models, was

only partially supported.

Table 9: Parental depressive symptoms predicting observed parental hostility

	F (each predictor)	β	SE	t	p
Dependent Variable: Hostility					
Blocks					
1. TP Race	3.63	0.17	0.46	1.90	ns
TP Socioeconomic Status	3.76	0.10	0.11	-1.94	ns
2. BDI-II	1.06	0.09	0.02	1.03	ns

Note. *N* = 104; BDI-II-II = Beck Depression Inventory-II.

Table 10: Parental depressive symptoms predicting observed parental warmth

	F (each predictor)	β	SE	t	p
Dependent Variable: Warmth					
Blocks					
1. TP Race	15.44	-0.34	0.39	-3.93	≤.01
2. BDI-II	2.44	-0.13	0.01	-1.56	ns

Note. *N* = 104; BDI-II-II = Beck Depression Inventory-II.

Table 11: Parental depressive symptoms predicting observed parental neglect/distancing

	F (each predictor)	β	SE	t	p
Dependent Variable: Neglect/Distancing					
Blocks					
1. BDI-II	4.28	0.18	0.01	2.068	≤.05

Note. N = 104; BDI-II-II = Beck Depression Inventory-II.

Table 12: Parental depressive symptoms predicting observed parental intrusiveness

	F (each predictor)	β	SE	t	p
Dependent Variable: Intrusiveness					
Blocks					
1. TP Marital Status	1.75	0.13	0.38	1.32	ns
TP Socioeconomic Status	3.68	-0.20	0.11	-1.92	ns
2. BDI-II	1.85	0.09	0.01	1.36	ns

Note. N = 104; BDI-II-II = Beck Depression Inventory-II.

Hypothesis 3: Observed parental hostility, intrusiveness, and withdrawal will be

significantly associated with parent- and child-reported child anxiety symptoms; a significant

association is not expected between parental warmth and child anxiety symptoms. To test

Hypothesis 3, eight sets of LMM analyses were conducted in which parent and child reports of

child anxiety symptoms were separately regressed on parental hostility, intrusiveness,

withdrawal, and warmth after controlling for relevant demographic variables (i.e., target parent

marital status and target parent socioeconomic status in all cases). None of these sets of

analyses was significant for the primary variables of interest. Specifically, as reported in Tables

13 and 14, observed parental hostility was not a significant predictor of either parent- reported

or child-reported child anxiety symptoms. As reported in Tables 15 and 16, observed parental

warmth was not a significant predictor of either parent-reported or child-reported child anxiety

symptoms. As reported in Tables 17 and 18, observed parental neglect/ distancing was not a

significant predictor of either parent-reported or child-reported child anxiety symptoms. Finally,

as reported in Tables 19 and 20, observed parental intrusiveness was not a significant predictor

of either parent-reported or child-reported child anxiety symptoms. Thus, Hypothesis 3, which

examined the link between observed parenting behaviors and child anxiety symptoms in the

proposed mediation model, was not supported.

Table 13: Observed parental hostility predicting parent-reported child anxiety symptoms

	F (each predictor)	β	SE	t	p
Dependent Variable: CBCL Anxiety Problems					
Blocks					
1. TP Marital Status	1.21	0.11	0.39	1.10	ns
TP Socioeconomic Status	4.24	-0.20	0.11	-2.06	≤.05
2. Hostility	0.89	0.09	0.09	0.94	ns

Note. N = 104.

Table 14: Observed parental hostility predicting child self-report of anxiety symptoms

	F (each predictor)	β	SE	t	p
Dependent Variable: YSR Anxiety Problems					
Blocks					
1. TP Marital Status	0.68	0.08	0.46	0.82	ns
TP Socioeconomic Status	1.86	-0.13	0.13	-1.36	ns
2. Hostility	2.85	0.15	0.10	1.69	ns

Note. N = 104.

Table 15: Observed parental warmth predicting parent-reported child anxiety symptoms

	F (each predictor)	β	SE	*t*	*p*
	Dependent Variable: CBCL Anxiety Problems				
Blocks					
1. TP Marital Status	1.37	0.12	0.40	1.17	ns
TP Socioeconomic Status	5.74	-0.23	0.11	-2.40	≤.05
2. Warmth	1.00	0.09	0.09	1.00	ns

Note. $N = 104$.

Table 16: Observed parental warmth predicting child self-report of anxiety symptoms

	F (each predictor)	β	SE	*t*	*p*
	Dependent Variable: YSR Anxiety Problems				
Blocks					
1. TP Marital Status	0.66	0.08	0.46	0.81	ns
TP Socioeconomic Status	2.52	-0.06	0.13	-1.59	ns
2. Warmth	2.58	-0.14	0.11	-1.61	ns

Note. $N = 104$.

Table 17: Observed parental neglect/distancing predicting parent-reported child anxiety symptoms

	F (each predictor)	β	SE	t	p
Dependent Variable: CBCL Anxiety Problems					
Blocks					
1. TP Marital Status	1.28	0.11	0.39	1.13	ns
TP Socioeconomic Status	4.97	-0.21	0.11	-2.23	≤.05
2. Neglect/Distancing	0.88	0.08	0.09	0.94	ns

Note. $N = 104$.

Table 18: Observed parental neglect/distancing predicting child self-report of anxiety symptoms

	F (each predictor)	β	SE	t	p
Dependent Variable: YSR Anxiety Problems					
Blocks					
1. TP Marital Status	0.77	0.09	0.47	0.88	ns
TP Socioeconomic Status	2.87	-0.17	0.13	-1.70	ns
2. Neglect/Distancing	0.13	0.03	0.11	0.36	ns

Note. $N = 104$.

Table 19: Observed parental intrusiveness predicting parent-reported child anxiety symptoms

	F (each predictor)	β	SE	t	p
	Dependent Variable: CBCL Anxiety Problems				
Blocks					
1. TP Marital Status	1.13	0.10	0.40	1.06	ns
TP Socioeconomic Status	4.71	-0.21	0.11	-2.17	≤.05
2. Intrusiveness	0.17	0.04	0.10	0.41	ns

Note. $N = 104$.

Table 20: Observed parental intrusiveness predicting child self-report of anxiety symptoms

	F (each predictor)	β	SE	t	p
	Dependent Variable: YSR Anxiety Problems				
Blocks					
1. TP Marital Status	0.43	0.07	0.47	0.66	ns
TP Socioeconomic Status	1.90	-0.14	0.14	-1.38	ns
2. Intrusiveness	2.74	0.09	0.11	1.65	ns

Note. $N = 104$.

Hypothesis 4: The association between current parental depressive symptoms and child anxiety symptoms will be significantly reduced when hostility, intrusiveness, and withdrawal are separately included in the regression model, indicating significant mediation. As previously noted, Hypothesis 4 was not tested, as Hypotheses 1 through 3 were not all supported.

3.2.4. Analyses with controls for parental anxiety and child depression

Analyses paralleling the primary analyses just described were conducted controlling for comorbid parental anxiety symptoms and child depressive symptoms. This is important given the highly comorbid nature of anxiety and depression in both adults (e.g., Kessler et al., 2003) and children (e.g., Angold & Costello, 1993). As discussed above, because one of the primary aims of the RHC study is to prevent depression in children who have a parent with depression in their families, children with current depression diagnoses are excluded from the study. However, to ensure that comorbid child depressive symptoms were not inflating the association between parental depression and child anxiety, secondary analyses were conducted in which any subthreshold symptoms of child depression were statistically controlled in all regression models. Similarly, to ensure that comorbid parental anxiety symptoms were not inflating the association between parent depression and child anxiety, subthreshold symptoms of parental anxiety were also statistically controlled in all regression models. Controlling for parental anxiety symptoms is particularly important given that parents are included in the RHC study regardless of their levels of current or previous anxiety symptoms.

Hypothesis 1b: Current parental depressive symptoms will be significantly associated with parent- and child-reported child anxiety symptoms after controlling for parental anxiety symptoms and parent- and child-reported child depressive symptoms. To test Hypothesis 1b, two sets of LMM analyses were conducted in which parent and child reports of child anxiety

symptoms were regressed on current parental depressive symptoms after controlling for relevant demographic variables, parental anxiety symptoms, and parent- and child-reported child depressive symptoms. As reported in Table 21, after controlling for target parent marital status and socioeconomic status, along with parental anxiety symptoms and child depressive symptoms, parental depressive symptoms *were* a significant predictor of parent-reported child anxiety symptoms. However, contrary to prediction, parental depressive symptoms were found to be *inversely* associated with parent-reported child anxiety symptoms; specifically, higher levels of parental depressive symptoms were associated with lower levels of child anxiety symptoms. Of note, parental anxiety symptoms and child depressive symptoms were both *positively* associated with parent-reported child anxiety symptoms in these analyses; specifically, higher levels of parental anxiety symptoms and child depressive symptoms were associated with higher levels of child anxiety symptoms.

As reported in Table 22, after controlling for target parent race and socioeconomic status, along with parental anxiety symptoms and child depressive symptoms, parental depressive symptoms were not a significant predictor of child self-reported anxiety symptoms. Thus, with the inclusion of controls for parental anxiety and child depression, Hypothesis 1b, or step one of Baron and Kenny's (1986) three steps for testing mediation models, remained unsupported.

Table 21: Parental depressive symptoms predicting parent-reported child anxiety symptoms with parental anxiety and child depression controlled

	F (each predictor)	β	SE	t	p
Dependent Variable: CBCL Anxiety Problems					
Blocks					
1. TP Marital Status	0.11	0.03	0.37	0.33	ns
TP Socioeconomic Status	4.71	-0.19	0.10	-2.17	<.05
2. BAI	5.04	0.23	0.02	2.25	<.05
CBCL Affective Problems	16.98	0.34	0.24	4.12	<.01
3. BDI-II	4.22	-0.20	0.02	-2.06	<.05

Note. N = 104; BDI-II-II = Beck Depression Inventory-II, BAI = Beck Anxiety Inventory, CBCL = Child Behavior Checklist.

Table 22: Parental depressive symptoms predicting child self-report of anxiety symptoms with parental anxiety and child depression controlled

	F (each predictor)	β	SE	t	p
Dependent Variable: YSR Anxiety Problems					
Blocks					
1. TP Race	0.09	-0.02	0.40	-0.29	ns
TP Socioeconomic Status	1.39	-0.10	0.11	-1.18	ns
2. BAI	4.10	0.18	0.02	2.03	≤.05
YSR Affective Problems	86.19	0.63	0.04	9.28	≤.01
3. BDI-II	1.99	-0.13	0.02	-1.41	ns

Note. N = 104; BDI-II-II = Beck Depression Inventory-II, BAI = Beck Anxiety Inventory, YSR = Youth Self Report.

Hypothesis 2b: *Current parental depressive symptoms will be significantly associated with observed parental hostility, intrusiveness, withdrawal, and warmth after controlling for parental anxiety symptoms.* To test Hypothesis 2, four sets of LMM analyses were conducted in which parental hostility, intrusiveness, withdrawal, and warmth were regressed on current parental depressive symptoms after controlling for relevant demographic variables and parental anxiety symptoms. None of these sets of analyses were significant. As reported in Table 23, results indicated that after controlling for target parent race and socioeconomic status, along with parental anxiety symptoms, parental depressive symptoms were not a significant predictor of observed parental hostility. As reported in Table 24, after controlling for target parent race, along with parental anxiety symptoms, parental depressive symptoms were not a significant predictor of observed parental warmth. As reported in Table 25, after controlling for parental anxiety symptoms, parental depressive symptoms were no longer a significant predictor of observed parental neglect/ distancing. Finally, as reported in Table 26, after controlling for target parent marital status and socioeconomic status, along with parental anxiety symptoms, parental depressive symptoms were not a significant predictor of observed parental intrusiveness. Thus, with the inclusion of the controls for parental anxiety, Hypothesis 2b, or step two of Baron and Kenny's (1986) steps for testing mediation models, was no longer partially supported.

Table 23: Parental depressive symptoms predicting observed parental hostility with parental anxiety controlled

	F (each predictor)	β	SE	t	p
Dependent Variable: Hostility					
Blocks					
1. TP Race	3.62	0.17	0.46	1.90	ns
TP Socioeconomic Status	3.96	-0.18	0.11	-1.99	≤.05
2. BAI	0.28	-0.06	0.02	-0.53	ns
3. BDI-II	1.32	0.13	0.02	1.15	ns

Note. N = 104; BDI-II-II = Beck Depression Inventory-II, BAI = Beck Anxiety Inventory.

Table 24: Parental depressive symptoms predicting observed parental warmth with parental anxiety controlled

	F (each predictor)	β	SE	t	p
Dependent Variable: Warmth					
Blocks					
1. TP Race	15.66	-0.34	0.40	-3.96	≤.01
2. BAI	0.77	0.09	0.02	0.88	ns
3. BDI-II	3.16	-0.19	0.02	-1.78	ns

Note. N = 104; BDI-II-II = Beck Depression Inventory-II, BAI = Beck Anxiety Inventory.

Table 25: Parental depressive symptoms predicting observed parental neglect/distancing with parental anxiety controlled

	F (each predictor)	β	SE	t	p
Dependent Variable: Neglect/Distancing					
Blocks					
1. BAI	0.01	0.01	0.02	0.10	ns
2. BDI-II	2.49	0.18	0.02	1.58	ns

Note. N = 104; BDI-II-II = Beck Depression Inventory-II, BAI = Beck Anxiety Inventory.

Table 26: Parental depressive symptoms predicting observed parental intrusiveness with parental anxiety controlled

	F (each predictor)	β	SE	t	p
Dependent Variable: Intrusiveness					
Blocks					
1. TP Marital Status	1.45	0.13	0.40	1.20	ns
TP Socioeconomic Status	3.64	-0.20	0.11	-1.91	ns
2. BAI	0.07	0.03	0.02	0.26	ns
3. BDI-II	0.88	0.10	0.02	0.94	ns

Note. N = 104; BDI-II-II = Beck Depression Inventory-II, BAI = Beck Anxiety Inventory.

Hypothesis 3b: *Observed parental hostility, intrusiveness, and withdrawal will be*

significantly associated with parent- and child-reported child anxiety symptoms after controlling

for parent- and child-reported child depressive symptoms; a significant association is not

expected between parental warmth and child anxiety symptoms. To test Hypothesis 3, eight

sets of LMM analyses were conducted in which parent and child reports of child anxiety

symptoms were regressed on parental hostility, intrusiveness, withdrawal, and warmth after

controlling for relevant demographic variables (i.e., target parent marital status and target

parent socioeconomic status in all cases) and child depressive symptoms. None of these sets of

analyses were significant. Specifically, as reported in Tables 27 and 28, after controlling for

parent- and child-reported child depressive symptoms, observed parental hostility was not a

significant predictor of either parent-reported child anxiety symptoms or child self-reported

anxiety symptoms. As reported in Tables 29 and 30, after controlling for parent- and child-

reported child depressive symptoms, observed parental warmth was not a significant predictor

of either parent-reported child anxiety symptoms or child self-reported anxiety symptoms. As

reported in Tables 30 and 31, after controlling for parent- and child-reported child depressive

symptoms, observed parental neglect/ distancing was not a significant predictor of either

parent-reported child anxiety symptoms or child self-reported anxiety symptoms. Finally, as

reported in Tables 32 and 33, after controlling for parent- and child-reported child depressive

symptoms, observed parental intrusiveness was not a significant predictor of either parent-

reported child anxiety symptoms or child self-reported anxiety symptoms. Thus, with the

inclusion of controls for parental anxiety and child depression, Hypothesis 3b, which examined

the link between observed parenting behaviors and child anxiety symptoms, remained

unsupported.

Table 27: Observed parental hostility predicting parent-reported child anxiety symptoms with child depression controlled

	F (each predictor)	β	SE	t	p
Dependent Variable: CBCL Anxiety Problems					
Blocks					
1. TP Marital Status	0.79	0.08	0.37	0.89	ns
TP Socioeconomic Status	3.36	-0.17	0.11	-1.83	ns
2. CBCL Affective Problems	16.01	0.33	0.06	4.00	≤.01
3. Hostility	0.02	0.01	0.08	0.13	ns

Note. N = 104; CBCL = Child Behavior Checklist.

Table 28: Observed parental hostility predicting child self-report of anxiety symptoms with child depression controlled

	F (each predictor)	β	SE	t	p
Dependent Variable: YSR Anxiety Problems					
Blocks					
1. TP Marital Status	0.06	0.02	0.39	0.25	ns
TP Socioeconomic Status	1.10	-0.09	0.11	-1.05	ns
2. YSR Affective Problems	80.25	0.62	0.04	8.96	≤.01
3. Hostility	0.26	0.04	0.08	0.51	ns

Note. N = 104; YSR = Youth Self Report.

Table 29: Observed parental warmth predicting parent-reported child anxiety symptoms with child depression controlled

	F (each predictor)	β	SE	t	p
Dependent Variable: CBCL Anxiety Problems					
Blocks					
1. TP Marital Status	0.94	0.09	0.37	0.97	ns
TP Socioeconomic Status	4.33	-0.19	0.10	-2.08	≤.05
2. CBCL Affective Problems	18.80	0.35	0.06	4.34	≤.01
3. Warmth	2.54	0.13	0.09	1.59	ns

Note. N = 104; CBCL = Child Behavior Checklist.

Table 30: Observed parental warmth predicting child self-report of anxiety symptoms with child depression controlled

	F (each predictor)	β	SE	t	p
Dependent Variable: YSR Anxiety Problems					
Blocks					
1. TP Marital Status	0.06	0.02	0.39	0.25	ns
TP Socioeconomic Status	1.22	-0.09	0.11	-1.11	ns
2. YSR Affective Problems	80.21	0.62	0.04	8.96	≤.01
3. Warmth	0.24	-0.03	0.09	-0.49	ns

Note. N = 104; YSR = Youth Self Report.

Table 31: Observed parental neglect/distancing predicting parent-reported child anxiety symptoms with child depression controlled

	F (each predictor)	β	SE	t	p
Dependent Variable: CBCL Anxiety Problems					
Blocks					
1. TP Marital Status	0.79	0.08	0.37	0.89	ns
TP Socioeconomic Status	3.42	-0.17	0.16	-1.85	ns
2. CBCL Affective Problems	16.31	0.33	0.06	4.04	≤.01
3. Neglect/Distancing	0.25	0.04	0.09	0.50	ns

Note. N = 104; CBCL = Child Behavior Checklist.

Table 32: Observed parental neglect/distancing predicting child self-report of anxiety symptoms with child depression controlled

	F (each predictor)	β	SE	t	p
Dependent Variable: YSR Anxiety Problems					
Blocks					
1. TP Marital Status	0.07	0.02	0.39	0.27	ns
TP Socioeconomic Status	1.34	-0.10	0.11	-1.16	ns
2. YSR Affective Problems	82.56	0.62	0.04	9.09	≤.01
3. Neglect/Distancing	0.03	-0.01	0.09	-0.17	ns

Note. N = 104; YSR = Youth Self Report.

Table 33: Observed parental intrusiveness predicting parent-reported child anxiety symptoms with child depression controlled

	F (each predictor)	β	SE	t	p
Dependent Variable: CBCL Anxiety Problems					
Blocks					
1. TP Marital Status	0.83	0.09	0.38	0.91	ns
TP Socioeconomic Status	3.60	-0.18	0.11	-1.90	ns
2. CBCL Affective Problems	16.85	0.34	0.06	4.10	≤.01
3. Intrusiveness	0.05	-0.02	0.09	-0.22	ns

Note. $N = 104$; CBCL = Child Behavior Checklist.

Table 34: Observed parental intrusiveness predicting child self-report of anxiety symptoms with child depression controlled

	F (each predictor)	β	SE	t	p
Dependent Variable: YSR Anxiety Problems					
Blocks					
1. TP Marital Status	0.02	0.01	0.39	0.15	ns
TP Socioeconomic Status	0.89	-0.08	0.11	-0.94	ns
2. YSR Affective Problems	80.15	0.62	0.04	8.95	≤.01
3. Intrusiveness	1.07	0.08	0.09	1.03	ns

Note. $N = 104$; YSR = Youth Self Report.

Hypothesis 4b: The association between current parental depressive symptoms and child anxiety symptoms will be significantly reduced when hostility, intrusiveness, and withdrawal are separately included in the regression model, indicating significant mediation, after parental anxiety symptoms and child depressive symptoms have been controlled. As with Hypothesis 4, Hypothesis 4b was not tested, as Hypotheses 1b through 3b were all not supported.

3.3. Secondary Analyses

As very limited support was found for the primary hypotheses of the current study, four sets of secondary analyses were conducted to further examine the data.

3.3.1. Categorical analyses examining child anxiety diagnostic status

Individuals who meet diagnostic criteria for an anxiety disorder may be categorically different from individuals with subclinical levels of anxiety with regard to associated risk factors and course of symptoms (Rapee, 2001). Consequently, secondary analyses were conducted to examine the association of parental depressive symptoms and child anxiety diagnostic status for the current sample.

As an initial step toward determining whether parenting behaviors served as a mediator between parental depressive symptoms and child anxiety diagnostic status, two logistic regression analyses were conducted to examine this association, first without and then with a control for parental anxiety symptoms. Of note, these regression analyses did not account for multiple children per family. The strategy adopted was that if this first step of Baron and Kenny's (1986) data analytic steps for testing mediation models were significant, then the analyses would be repeated accounting for multiple children per family.

Because several groups of researchers have found strong evidence for an overall construct of anxiety disorder in children but only weak support for the delineation of separate

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childhood anxiety disorders (Angold, Costello, & Erkanli, 1999; Cantwell & Baker, 1989; Schniering et al., 2000), an anxiety disorder was considered present if the child met criteria for any anxiety disorder measured by the K-SADS-PL (i.e., separation anxiety disorder, social anxiety disorder, generalized anxiety disorder, panic disorder, and agoraphobia). However, as previously noted, no child in the current sample met criteria for either panic disorder or agoraphobia. As reported previously in Table 4, sixteen percent of the current sample met criteria for an anxiety disorder.

As reported in Table 35, results from the first logistic regression, in which parental anxiety symptoms were not controlled, indicate that parental depressive symptoms did not significantly predict child anxiety diagnostic status for the current sample. Similarly, as reported in Table 36, results from the second logistic regression indicate that the relation between parental depressive symptoms and child anxiety diagnostic status remained non-significant after controlling for parental anxiety symptoms. As noted above, the subsequent data analytic steps outlined by Baron and Kenny (1986) for testing mediation were not conducted in light of the failure to find a significant association between parental depressive symptoms and child anxiety diagnostic status.

Table 35: Logistic regression: parental depressive symptoms predicting child anxiety diagnostic status

	β	SE	Wald's χ2	df	p
Dependent Variable: K-SADS-PL Child Anxiety Diagnostic Status					
Blocks					
1. BDI-II	0.19	0.02	0.08	1	ns

Note. N = 104; BAI = Beck Anxiety Inventory, BDI-II = Beck Depression Inventory-II.

Table 36: Logistic regression: parental depressive symptoms predicting child anxiety diagnostic status with parental anxiety controlled

	β	SE	Wald's χ2	df	p
Dependent Variable: K-SADS-PL Child Anxiety Diagnostic Status					
Blocks					
2. BAI	1.23	0.03	2.69	1	ns
3. BDI-II	-0.63	0.03	0.06	1	ns

Note. N = 104; BAI = Beck Anxiety Inventory, BDI-II = Beck Depression Inventory-II.

3.3.2. Moderation analyses: The roles of child age and gender

Given the relatively wide age range of the current sample (9 years to 15 years, 11 months), along with literature suggesting gender differences in the development and maintenance of anxiety disorders (Weiss & Last, 2001), secondary analyses were conducted to determine if child age or gender significantly interacted with parental depressive symptoms to predict parent and child reports of child anxiety symptoms. Results of LMM analyses indicated that child age did not significantly moderate the association of parental depressive symptoms and parent-reported child anxiety symptoms ($t = 0.77$, $\beta = 0.07$, $p = .44$) or the association of parental depressive symptoms with child self-report of anxiety symptoms ($t = 1.66$, $\beta = 0.12$, $p = .10$). Similarly, child gender did not significantly moderate the association of parental depressive symptoms with parent-report ($t = 1.70$, $\beta = 0.14$, $p = .09$) or child-report ($t = -0.02$, $\beta = -.0070$, $p = .80$) of child anxiety symptoms.

3.3.3. Parenting as a moderator of the association between parental depression and child anxiety

Given the limited support found for the hypothesized role of parenting behaviors as mediators of the association between parental depressive symptoms and child anxiety symptoms, exploratory analyses were conducted to determine if the same parenting behaviors may be better conceptualized as moderators of this relation. Interaction terms were formed between parental depressive symptoms and each of the four parenting behaviors. Results of LMM analyses including the interaction terms indicated that none of the four parenting behaviors moderated the relation between parental depressive symptoms and child anxiety symptoms. Specifically, parental hostility did not moderate the association of parental depressive symptoms with parent-reported ($t = -0.39$, $\beta = -0.03$, $p = .70$) or child-reported ($t = -$

0.35, β = -0.02, p = .73) child anxiety. Similarly, parental warmth did not moderate the association of parental depressive symptoms with parent-reported (t = -0.56, β = -0.05, p = .58) or child-reported (t = -0.87, β = 0.07, p = .39) child anxiety. Parental neglect/distancing did not moderate the association of parental depressive symptoms with parent-reported (t = 0.44, β = 0.04, p = .66) or child-reported (t = 0.86, β = 0.06, p = .86) child anxiety. Finally, parental intrusiveness did not moderate the association of parent-reported (t = -0.43, β = -0.03, p = .67) or child-reported (t = -1.69, β = -0.11, p = .09) child anxiety.

3.3.4. Reports of parental Positive Involvement on the Alabama Parenting Questionnaire

A final set of secondary analyses were conducted to determine if parent or child report of parenting behaviors via the APQ were significantly associated with either parental depressive symptoms or child anxiety symptoms for the current sample. As previously discussed, because the Positive Involvement construct is the only subscale of the APQ that maps onto any of the specific parenting behaviors examined in the current study (i.e., warmth), only the Positive Involvement subscale was examined. Results of LMM analyses indicated that parental depressive symptoms were not significantly associated with either parent report (t = -0.42, β = -0.05, p = .68) or child report (t = -0.41, β = -0.05, p = .68) of positive involvement on the APQ. Similarly, parent self-report of positive involvement was not significantly associated with parent-reported child anxiety (t = 1.69, β = 0.14, p = .09). However, a significant positive relation was found between child report of positive involvement and parent report of child anxiety (t = 2.00, β = 0.16, p < .05). Specifically, and unexpectedly, results indicated that as child-reported positive involvement increased, parent-reported child anxiety also increased. Parent (t = 1.14, β = 0.08, p = .26) and child (t = -0.55, β = -0.04, p = .59) reports of positive involvement on the APQ were not significantly associated with child report of anxiety.

CHAPTER 4: DISCUSSION

Major depressive disorder (MDD) is estimated to impact nearly one in five people in the United States during their lifetime (Kessler et al., 2003) and is one of the leading causes of disease-related disability worldwide (Murray & Lopez, 1997). Studies from the last few decades indicate that children and adolescents living with a depressed caregiver are at increased risk for a wide range of emotional and behavioral problems (Beardslee et al., 1983; Downey & Coyne, 1990), including difficulties with anxiety (e.g., Feng et al., 2008). Parenting behavior has been identified as one potential mechanism by which children of parents with depression develop depression and other forms of psychopathology, potentially including anxiety (Goodman & Gotlib, 1999). The current study was designed to extend past research in the areas of parental depression and parenting by examining parenting behavior as an explanatory mechanism for the association of parental depressive symptoms and child anxiety symptoms.

Although parental depression has been shown to have non-specific associations across child emotional and behavioral problems (see reviews by Goodman & Tully 2006; Shanahan, Copeland, Costello, & Angold, 2008), several groups of researchers (McKee et al. 2008b; McMahon, Grant, Compas, Thurm, & Ey, 2003; Shanahan et al. 2008) have recently emphasized the importance of examining whether specific risk factors, such as parental depression, are associated with specific child outcomes, such as child anxiety. Although the extant literature is limited, both cross-sectional and retrospective studies indicate increased rates of anxiety disorders among children of parents with depression histories (e.g., Beidel & Turner 1997; Fendrich et al. 1990; Hammen & Brennan 2003; Ohannessian et al. 2005). Moreover, most (e.g., Lieb, Isensee, Hofler, Pfister, & Wittchen, 2002; Weissman, Warner, Wickramaratne, Moreau, & Olfson, 1997; Wickramaratne & Weissman, 1998), though not all (Biederman et al. 2006),

existing longitudinal studies demonstrate that offspring of depressed parents are at increased

risk for developing anxiety disorders. The most rigorous way to examine the relation between

parent depression and child anxiety is by experimental manipulation of parent depression

through medication or psychosocial intervention, and there is some limited support for the

treatment of parental depression alleviating children's mental health problems (e.g., Weissman

et al. 2006a; for a review, see Gunlicks & Weissman 2008). In summary, some limited cross-

sectional, retrospective, and longitudinal data support an association between parental

depression and child anxiety.

Prior research has also suggested a relation between parental depression and parenting

behavior. In their model of depression risk transmission, Goodman and Gotlib (1999)

hypothesized that mothers with depression have difficulty meeting the social, emotional, and

behavioral needs of their children via adequate parenting. The extant literature supports this,

as the parenting behaviors of mothers with depression have been found to differ in important

ways from the parenting behaviors of mothers without a depression history (Lovejoy et al.,

2000). In a recent meta-analysis, Lovejoy et al. analyzed the results of 46 observational studies

of parent-child interactions to determine the strength of the association between maternal

depression and parenting behavior. Three main categories of parenting behaviors were

identified: 1) negative/hostile behaviors, including negative maternal affect and hostile or

coercive behaviors; 2) positive behaviors, including warmth, enthusiasm, praise, and

affectionate contact; and 3) disengagement, including neutral affect and behaviors indicative of

lack of involvement with the child. The findings indicated a medium effect size for the

association between maternal depression and negative parenting behaviors, a small to medium

effect size for the association between maternal depression and disengagement, and a small effect size for the association between maternal depression and positive parenting behaviors.

Finally, prior research has suggested a relation between parenting behavior and child anxiety. In a recent meta-analysis of studies examining the relation between specific parenting behaviors and child anxiety outcomes (McLeod et al., 2007b), five specific parenting behaviors (i.e., warmth, hostility, intrusiveness, withdrawal, and autonomy-granting) were associated with child anxiety to differing degrees. Medium effect sizes were found for the associations of hostility, intrusiveness, and withdrawal with child anxiety, and a small effect size was found for the association of warmth with child anxiety. A large effect size was found for the association of autonomy-granting with child anxiety; however, because the autonomy-granting construct has not been examined in the depression literature, it was not examined in the current study. Thus, hostility, intrusiveness, withdrawal, and, to a lesser extent, warmth have been consistently associated with child anxiety in previous research.

The above theory and research guided development of four primary hypotheses in the current study:

1) Parental depressive symptoms would be significantly associated with parent and child reports of child anxiety symptoms;

2) Parental depressive symptoms would be significantly associated with each of the four parenting behaviors of interest (i.e., hostility, intrusiveness, withdrawal, and warmth);

3) Three of the four parenting behaviors of interest (i.e., hostility, intrusiveness, and withdrawal) would be significantly associated with parent and child reports of child anxiety symptoms; and

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4) The same three parenting behaviors of interest (i.e., hostility, intrusiveness, and withdrawal) would each separately and significantly mediate the association between parental depressive symptoms and parent- and child-reported child anxiety symptoms.

In light of the high comorbidity of depression and anxiety in both children and adults, all primary analyses were conducted both without and with controls for parental anxiety symptoms and child depressive symptoms. Findings from LMM analyses, discussed in detail in the following paragraphs, did not support the hypothesized role of specific parenting behaviors as mediators of the association of parental depression and child anxiety.

In the first study hypothesis, it was predicted that parental depressive symptoms would be significantly and positively associated with parent and child reports of child anxiety symptoms, such that higher levels of parental depressive symptoms would be associated with higher levels of child anxiety symptoms. Counter to findings from previous research, the hypothesized relation between parental depressive symptoms and child anxiety symptoms was not found in primary analyses that did not control for comorbid parental anxiety symptoms or child depressive symptoms. In contrast, an *inverse* relation was found between parental depressive symptoms and parent-reported child anxiety symptoms when parental anxiety and child depression were controlled. Specifically, results indicated that higher levels of parental depressive symptoms were predictive of lower levels of parent-reported child anxiety symptoms. Parental depressive symptoms were not predictive of child self-report of anxiety symptoms.

Three explanations are offered for this finding of an inverse relation between parental depressive symptoms and parent-reported child anxiety symptoms after parental anxiety

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symptoms and child depressive symptoms were controlled. First, the children in the current

sample may have attempted to keep their anxiety hidden from their parents. Children of

parents with depression may adopt a caretaking role and either deny or hide their own

symptoms of anxiety as a consequence. The more severe the parents' symptoms of depression,

the more their children may have denied or hidden their anxiety symptoms in an attempt to

relieve their parents of any additional emotional burden.

Some support for this explanation comes from a recent study by Champion and

colleagues (2009), who examined caretaking behaviors by adolescent children of mothers both

with and without a history of depression. Champion et al. found that among the children of

mothers with a history of depression, emotional caretaking was related to adolescents' self-

reports on the Anxiety/Depression scale of the CBCL/6-18 and YSR/11-18. In contrast, the

mothers of adolescents who engaged in emotional caretaking perceived them as more

competent and capable. Thus, as offered in explanation by Champion et al., the children may

have attempted to hide their distress from their mothers as a means of relieving their mothers

from additional emotional burden. Consistent with this explanation, in the current study,

children reported somewhat lower levels of both anxiety symptoms (T-score = 55.36) and

depressive symptoms (T-score = 56.60) than did their parents (T-score = 57.98 and T-score =

60.47, respectively).

A second explanation for the inverse relation found between parental depressive

symptoms and child anxiety symptoms after controlling for parental anxiety and child

depression, is that parents with higher levels of depression may have been less aware of their

children's distress as a consequence of their own depression. More specifically, it is possible

that an inverse relation may have emerged between parental depressive symptoms and parent-

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reported child anxiety symptoms because parents were "blinded" by their own depression. Research suggests that one of the characteristics of depressive disorders is internal self-focus (Ingram, 1990). Consequently, it may be that parents with higher levels of depressive symptoms were less aware of the problems with anxiety in their children. The positive relation found in the current study between parent and child depressive symptoms presents somewhat of a challenge to this hypothesis. However, it may be that parents were more focused on symptoms in their children that were similar to their own. In support of this explanation, parents in the current study reported somewhat higher levels of depressive symptoms (T-score = 60.47) than anxiety symptoms (T-score = 57.98) for their children. However, it may be that children in the current sample were in fact experiencing more depressive symptoms than anxiety symptoms due to the high degree of heritability of depressive disorders (Goodman & Gotlib, 1999).

The last explanation offered here for the inverse relation found between parental depressive symptoms and parent-reported child anxiety symptoms is a suppression effect (Cohen, Cohen, West, & Aiken, 2003). Parental depressive symptoms and parent-reported child anxiety symptoms were not significantly associated at the bivariate level. Rather, the significant inverse association between them emerged only after comorbid parental anxiety symptoms and child depressive symptoms were controlled in LMM analyses. This finding is consistent with what has been termed a *suppression effect* (Cohen et al., 2003). A suppressor variable is defined as a variable which increases the predictive validity of another variable, or set of variables, by its inclusion in a regression equation. As explained by MacKinnon, Krull, and Lockwood (2000), in confounding and mediational hypotheses, it is typically assumed that statistical adjustment for a third variable will reduce the magnitude of the relation between the independent and dependent variables. In mediation, the relation is reduced because the mediator explains part

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or all of it. In confounding, the relation is reduced because the third variable removes distortion due to the confounding variable. In contrast, in the case of suppression, the statistical removal of a confounding effect could *increase* the magnitude of the relation between the independent and dependent variable (MacKinnon et al., 2000). Thus, the emergence of the inverse relation between parental depressive symptoms and child anxiety symptoms after controlling for the comorbid associations of parental anxiety and child depression could be viewed as a suppression effect.

However, there is a great deal of skepticism about suppression effects (e.g., Wiggins, 1973). This skepticism appears to be especially warranted in this instance, as the inverse relation found between parental depressive symptoms and child anxiety symptoms runs counter to previous research suggesting a positive relation between parental depression and child anxiety. Moreover, in correlation analyses in the current study, parental depressive symptoms were positively associated with both parental anxiety symptoms ($r = .61$) and parent-reported child depressive symptoms ($r = .26$). Thus, it is important to consider that the inverse relation found between parental depressive symptoms and parent-reported child anxiety symptoms may be a mere spurious association or artifact that does not warrant intense scrutiny or serious interpretation.

Thus, no support was found for the hypothesized positive relation between parental depressive symptoms and child anxiety symptoms. Although an inverse relation between parental depressive symptoms and child anxiety symptoms was found after controlling for comorbid parental anxiety symptoms and child depressive symptoms, this relation was likely spurious. As a consequence, and in light of the relatively wide age range of the current sample (9 years to 15 years, 11 months), along with literature suggesting gender differences in the

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development and maintenance of anxiety disorders (Weiss & Last, 2001), secondary analyses were conducted to begin to determine if an association between parental depressive symptoms and child anxiety symptoms might be moderated by child age or gender and thus only exist for one age group (e.g., adolescents but not preadolescents) or gender (e.g., females but not males). However, results of moderation analyses using LMM indicated that neither child age nor gender significantly interacted with parental depressive symptoms to predict child anxiety symptoms.

Secondary analyses were also conducted to determine if parental depressive symptoms might be associated with likelihood of having a child anxiety disorder. Theoretically, individuals who meet diagnostic criteria for an anxiety disorder may be categorically different from individuals with subclinical levels of anxiety with regard to associated risk factors and course of symptoms (Rapee, 2001). Consequently, logistic regression analyses were conducted to examine the association of parental depressive symptoms and child anxiety diagnostic status for the current sample. Results from these analyses indicated that the relation between parental depressive symptoms and child anxiety diagnostic status was not significant. Thus, secondary analyses did not help to explain the lack of support for the hypothesized positive relation between parental depressive symptoms and child anxiety symptoms.

In the second study hypothesis, it was predicted that parental depressive symptoms would be significantly associated with each of the four parenting behaviors of interest, such that higher levels of parental depressive symptoms would be significantly associated with higher levels of hostility, intrusiveness, and withdrawal, and lower levels of warmth. The hypothesized relations between parental depressive symptoms and three of the four parenting behaviors of interest (i.e., hostility, intrusiveness, and warmth) were not found. In contrast, a significant

association was found between parental depressive symptoms and observed parental withdrawal. Specifically, higher levels of parental depressive symptoms were associated with higher levels of withdrawal. Of note, however, after controlling for parental anxiety, this association was no longer significant.

In their meta-analysis of 46 observational studies assessing the strength of the association between parental depressive symptoms and negative (e.g., hostile, coercive, intrusive), disengaged (i.e., uninvolved, withdrawn), and positive (i.e., enthusiastic, engaged) maternal behaviors, Lovejoy et al. (2000) found the strongest association for negative maternal behavior (d = .40), followed by a somewhat weaker association for maternal disengagement (d = .29) and a much weaker association for positive maternal behavior (d = .16). As Lovejoy et al. did not control for comorbid maternal anxiety, the significant relation found in the current study between parental depressive symptoms and withdrawal before controlling for parental anxiety symptoms is consistent with the association found by Lovejoy et al. for disengaged maternal behavior. Similarly, although a significant association was hypothesized for parental depressive symptoms and observed parental warmth, the lack of support for this hypothesis is not surprising in light of the relatively weak association found for maternal depressive symptoms and positive maternal behavior by Lovejoy et al. In contrast, the finding in the current study that parental depressive symptoms were not significantly associated with observed parental hostility and intrusiveness even before controlling for parental anxiety symptoms is surprising given that the strongest relation with maternal depressive symptoms found by Lovejoy et al. was for maternal behaviors such as hostility and intrusiveness.

Two explanations are offered for the finding that parental depressive symptoms were not significantly associated with observed parental hostility and intrusiveness. The first

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explanation pertains to the interaction task, which may have been too short in duration or too contrived in nature to capture the parenting behaviors examined. More specifically, the lack of significant findings may have been due to the short length of the interaction task and thus to low levels of the four parenting behaviors examined. Alternatively, the contrived nature of the interaction tasks may have limited the validity of the parent-child interactions. For example, parents may have been more cautious in their interactions with their children during the interaction task than they are typically because they knew they were being observed. However, descriptive data for the observed parenting behaviors do not provide consistent support for either of these alternatives. Although the mean scores for observed parental hostility and intrusiveness were low ($M = 3.82$, $SD = 2.04$ and $M = 3.07$, $SD = 1.84$, respectively), indicating that parents, on average, were only *minimally* to *somewhat* hostile and intrusive in their interactions with their children, the mean score for parental neglect/ distancing, or withdrawal, which *was* significantly associated with parental depressive symptoms, was equally low ($M = 2.89$, $SD = 1.84$). Additionally, in the meta-analysis by Lovejoy et al. (2000), observation length was not a significant moderator of the relation between maternal depression and negative maternal behavior.

A second explanation for the finding that parental depressive symptoms were not associated with observed parental hostility and intrusiveness could be that parental depressive symptoms are not the best indicator of depression among parents with a depression history. Instead, other indicators of depression, such as number or severity of current or previous episodes may be more reliably associated with parenting deficits. For example, Lovejoy et al. (2000) found that the association between maternal depression and negative maternal behavior was strongest for current depression, defined as episodes or syndromes occurring in the last

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year. In contrast, parents in the current study were included if they had a history of a depressive episode in the lifetime of their oldest eligible child and were not required to be experiencing a depressive episode currently or to have experienced an episode in the year prior to their baseline assessment.

However, in an unpublished dissertation, Jaser (2007) found that mothers with a history of depression who were not currently depressed were significantly more likely to exhibit negative affect and hostile parenting behaviors than mothers with no depression history, suggesting that hostile parenting can be present even when parents are not experiencing a current depressive episode. Moreover, Jaser found that mothers' current depressive symptoms were related to both higher levels of observed negative affect and mother- and child-reported intrusive parent behaviors. Thus, it is not clear why a significant relation was not found between parental depressive symptoms and observed parental hostility and intrusiveness in the current study.

In summary, limited support was found for the hypothesized relations between parental depressive symptoms and the observed parenting behaviors. As a consequence, and to explore the possibility that parental depressive symptoms might have been associated with another modality of parenting measure, secondary analyses were conducted examining the association of parental depressive symptoms and parent and child reports on the Alabama Parenting Questionnaire (APQ). As previously discussed, because the Positive Involvement construct is the only subscale of the APQ that maps onto any of the specific parenting behaviors examined in the current study (i.e., warmth), only the Positive Involvement subscale was examined. However, results of LMM analyses indicated that parental depressive symptoms were not significantly associated with parent or child report of Positive Involvement. These findings are consistent

with the absence of a relation between parental depression symptoms and observed parental warmth.

In the third study hypothesis, it was predicted that hostility, intrusiveness, and withdrawal would each be significantly associated with parent and child reports of child anxiety symptoms, such that higher levels of hostility, intrusiveness, and withdrawal would be significantly associated with higher levels of child anxiety symptoms. Given the relatively low effect size found for the association between parental warmth and child anxiety in the meta-analysis conducted by McLeod et al. (2007b), a significant association between these two variables was not expected. The hypothesized relations between the observed parenting behaviors and child anxiety symptoms, both before and after controlling for comorbid child depressive symptoms, were not found.

Three explanations are provided for the finding that the observed parenting behaviors were not significantly associated with child anxiety symptoms. First, there may be too few items on the CBCL/6-18 and YSR/11-18 Anxiety Problems scale to obtain a reliable measure of child anxiety. The Anxiety Problems subscale is comprised of only six items. Moreover, the internal consistencies of the Anxiety Problems subscale for both the CBCL/6-18 (α = .57) and YSR/11-18 (α = .66) were low in the current study. Thus, it is possible that the scale did not provide a reliable measure of child anxiety symptoms. Additionally, the low internal consistencies for the scale may have precluded sufficient power to detect the hypothesized relations with child anxiety symptoms.

However, results from preliminary regression analyses with a longer anxiety scale do not support this explanation. Specifically, regression analyses that utilized a broader anxiety scale with 13 items, more than double the number of items that comprise the Anxiety Problems scale

of the CBCL/6-18 and YSR/11-18, were initially conducted to determine if the association between parental depressive symptoms and child anxiety symptoms would change with a longer, and potentially more reliable, measure of child anxiety symptoms. Results from these analyses were similar to those found with the more established Anxiety Problems scale.

Two other possible explanations for the finding that the observed parenting behaviors were not significantly associated with child anxiety symptoms have to do with the parenting behaviors themselves. First, it is possible that parenting behaviors other than those examined here may play a more important role in the development of child anxiety problems. For example, the parenting construct known as *autonomy-granting*, which was not examined in the current study due to an absence of research linking it to parental depression, appears to be particularly important for child anxiety. In the McLeod et al. (2007b) meta-analysis, autonomy-granting, defined as "parental encouragement of children's opinions and choices, acknowledgement of children's independent perspectives on issues, and solicitation of children's input on decisions and solutions of problems" (p. 162), accounted for 18% of the variance in child anxiety outcomes. In contrast, the parenting behaviors examined here accounted for substantially less variance in child anxiety in the McLeod et al. study. Thus, autonomy granting, and other parenting variables not examined in the current study, may play a more important role in child anxiety outcomes.

Second, it is possible that parenting generally may play only a modest role in the development and maintenance of child anxiety (McLeod et al., 2007b). Across the 47 studies testing the association of parenting and child anxiety that were analyzed by McLeod et al., parenting accounted for a mere four percent of the total variance in child anxiety. McLeod et al.

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concluded that understanding the origins of children's anxiety will likely require identifying factors other than parenting that account for the remaining variance.

Thus, no support was found for the hypothesized relations between the observed parenting behaviors and child anxiety symptoms. As a consequence, and to explore the possibility that child anxiety symptoms might have been significantly predicted using another modality of parenting measure, secondary analyses were conducted examining the association of child anxiety symptoms and parent and child reports of Positive Involvement on the Alabama Parenting Questionnaire (APQ). Parent and child reports of Positive Involvement on the APQ were not significantly associated with child report of anxiety symptoms. However, whereas parent report of positive involvement was not significantly associated with parent-reported child anxiety in LMM analyses, a significant positive relation emerged between child report of positive involvement and parent report of child anxiety. Counter to expectation, results indicated that as child-reported positive involvement increased, parent-reported child anxiety also increased.

This finding runs counter to most extant research, which generally indicates an inverse relation between parental positive involvement and child internalizing problems (McKee, Colletti, Rakow, Jones, & Forehand, 2008a). However, one recent study examining the specificity of parental warmth and involvement in the prediction of child internalizing symptoms found a similar result to the one found here (McKee et al., 2008b). McKee and colleagues found that although warmth was not significantly related to internalizing problems in correlation analyses, it was positively related to internalizing problems in mixed model analyses.

Three explanations are offered for this counterintuitive finding. First, although in the current study the direction of effect was assumed to be from parenting behavior to child anxiety

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problems, because of the cross-sectional nature of the study, it is equally possible that child anxiety elicited certain behaviors by parents (Belsky & Jaffee, 2006). As such, parents may have identified emerging anxiety symptoms in their children and responded with increased positive involvement in an attempt to relieve their children's distress. Second, parents' positive involvement may have been misinterpreted by their children. Because parental intrusiveness has been found to characterize the interactions of depressed parents with their children (Lovejoy et al., 2000), it is possible that children of depressed parents may come to experience parental positive involvement as intrusiveness instead. If this is the case, a positive relation would be expected between positive involvement and child anxiety in the context of parental depression. Third and last, like the inverse relation found between parental depressive symptoms and parent-reported child anxiety symptoms, the positive relation between child-reported positive involvement and parent-reported child anxiety may be spurious in nature and may not warrant serious interpretation. Given that the extant literature generally indicates a negative relation between parental warmth and child internalizing problems, and that a significant relation did not emerge between observed parental warmth and child anxiety, this last explanation is likely the most probable.

In the fourth and last study hypothesis, it was predicted that hostility, intrusiveness, and withdrawal would each separately and significantly mediate the associations between parental depressive symptoms and parent-reported child anxiety symptoms and between parental depressive symptoms and child-reported child anxiety symptoms. Specifically, it was hypothesized that the associations between parental depressive symptoms and parent- and child-reported child anxiety symptoms would be significantly reduced when hostility, intrusiveness, and withdrawal were included in the regression equation. As in hypothesis three,

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in light of the relatively low effect size found for the association between parental warmth and child anxiety across the extant literature (McLeod et al., 2007b), parental warmth was not expected to significantly mediate the association between parental depressive symptoms and child anxiety symptoms. As noted in the results, because significant relations were not found between the primary variables of interest as outlined in the first three hypotheses, analyses testing this last hypothesis were not conducted.

In summary, no support was found for the four observed parenting behaviors examined as mediators of the association between parental depressive symptoms and child anxiety symptoms. In addition, with the exceptions of the inverse relation found between parental depressive symptoms and parent report of child anxiety symptoms, which was likely spurious, and the association found between parental depressive symptoms and observed parental withdrawal, no support was found for the proposed links in the mediation model.

4.1. Limitations and Strengths

The findings of this study must be considered in the context of both its limitations and its strengths. The cross-sectional nature of the study design precludes our ability to assess direction of effect between parental depressive symptoms and the observed parenting behaviors, and between the observed parenting behavior and child anxiety symptoms. The hypotheses tested in the current study suggest that the direction of effect is from parental depressive symptoms to parenting behaviors, and from parenting behavior to child anxiety symptoms. However, it is equally possible that ineffective parenting elicits parental depressive symptoms. For example, there is substantial research indicating that when parenting behaviors improve, parental depressive symptoms remit (see McMahon & Forehand, 2003). Similarly, it is equally possible that child anxiety symptoms elicit ineffective parenting strategies from parents.

More specifically, anxiety in children may develop as a consequence of one of the other three mechanisms of transmission outlined by Goodman and Gotlib (1999), including genes and biology; this anxiety may then elicit specific parenting behaviors as parents attempt to decrease the distress they observe in their children. Although parenting behavior was not found to significantly predict child anxiety symptoms in the current study, future studies that do find a significant relation between these variables should employ a longitudinal design in order to better determine direction of effect.

In addition, as this study utilized current parental depressive symptoms as the indicator of depression, the role of variables such as severity, duration, and timing of parental depressive episodes during the lifetime of the child were not explicitly examined. In a study examining the role of all three of these factors in children's risk for developing depression and other problems, Hammen and Brennan (2003) found severity of maternal depressive episodes to be the best predictor of subsequent depression in children. Specific to child anxiety, their results suggested an association between longer duration of mild maternal depression and occurrence of youth non-depressive disorders, including anxiety disorders; however, the sample size precluded analyses of specific non-depressive disorders. Timing of exposure to maternal depression appears to play a less important role in the development of subsequent problems in children, as Hammen and Brennan found that a similar proportion of children received a depression diagnosis regardless of the developmental period in which their mother's depression occurred. The current study did not examine the moderating role of severity or duration of parents' depressive episodes. As such, potentially significant relations between parental depression and child anxiety may have been obscured. Future research should take such factors into account to

determine whether there is a significant relation between parental depression and child anxiety for certain subgroups of parents with depression.

A final limitation of the current study is a mostly Caucasian, relatively well-educated sample comprised primarily of mothers. Consequently, generality of the findings to more racially and socioeconomically diverse populations and to fathers is limited.

Although there were a number of limitations to the current study, there were also a number of strengths that merit discussion. First, the age range for inclusion in the RHC study was 9 to 15 years. This age range is appropriate for examining anxiety problems in children in light of the findings by Weissman et al. (2006b) that the peak incidence of child anxiety disorders occurs approximately between the ages of 5 and 10 years, and by Kessler et al. (2005) that the median age of onset of child anxiety disorders is 11 years. The findings from these two studies suggest that studying young children would not identify those most at risk for anxiety. Furthermore, as anxiety disorders are relatively stable once they onset (e.g., Lovibond, 1998; Nes, Roysamb, Reichborn-Kjennerud, Harris, & Tambs, 2007), studying children as old as 15 appears warranted.

Second, because one of the primary aims of the RHC study is to *prevent* depression in children who have a parent with depression in their families, children with current depression diagnoses are excluded from the study. Thus, a diagnosis of current depression is in essence controlled for in this sample. Third, the current study used measures from multiple reporters (i.e., parent and child) and multiple modalities (i.e., questionnaire, interview, observation). In their examination of family environment factors as mediating variables in the association of maternal depression and offspring psychopathology, Burt et al. (2005) found that analyses using a single informant (i.e., maternal report) and time point for all variables showed evidence for

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substantial mediation, whereas mediating effects were reduced in analyses utilizing data from multiple informants and time points. Although the data used in the current study were from only a single time point, data from multiple informants (i.e., parent and child) and modalities (i.e., questionnaire, interview, and observation) provided a more rigorous test of mediation and may help explain the lack of significant findings.

4.2. Summary and Future Directions

In summary, the current study found little support for the relations hypothesized. No support was found for the hypothesized positive relation between parental depressive symptoms and child anxiety symptoms. Although an inverse relation between parental depressive symptoms and child anxiety symptoms was found after controlling for comorbid parental anxiety symptoms and child depressive symptoms, this relation was likely spurious. Similarly, limited support was found for the hypothesized associations between parental depressive symptoms and the observed parenting behaviors. Specifically, the expected relations between parental depressive symptoms and hostility, intrusiveness, and warmth were not found. A positive association was found between parental depressive symptoms and observed parental withdrawal, but the association did not remain after controlling for parental anxiety. Finally, no support was found for the hypothesized relations between the observed parenting behaviors and child anxiety symptoms.

In light of these findings, several suggestions are made for future research examining the role of parenting behaviors in the association of parental depression with child anxiety. First, future research should examine the relation of parental depressive symptoms and autonomy-granting. As described in the discussion, autonomy-granting, which was not examined in the current study due to an absence of research linking it to parental depression,

appears to be particularly important for child anxiety. In the McLeod et al. (2007b) meta-analysis, autonomy-granting accounted for the highest percentage of the variance in child anxiety among all of the parenting behaviors examined. Although autonomy-granting has not been examined in relation to depression, it is the theoretical opposite of intrusiveness. Although intrusiveness was not significantly associated with either parental depression or child anxiety in the current study, it has been associated with both of these variables in previous research (Lovejoy et al., 2000; McLeod et al., 2007b; van der Bruggen, Stams, Geert Jan, & Bögels, 2008). Parental intrusiveness and withdrawal have been found to characterize the interactions of depressed parents with their children (Lovejoy et al., 2000), suggesting that parents may alternate between periods of over-involvement and under-involvement rather than providing constant, developmentally appropriate levels of autonomy-granting. Should parental depression be linked to autonomy-granting, then additional studies could examine autonomy-granting as a mediator of the association between parental depression and child anxiety.

Future research should also examine the relation between parental depression and individual child anxiety disorders, as stronger associations may emerge when specific anxiety disorders that are more highly comorbid with depression, such as generalized anxiety disorder and social phobia, are examined (Biederman et al., 2001; Shanahan et al., 2008). For example, Biederman and colleagues found that parental depression may be related to some, but not all, anxiety disorders. Assessing specific anxiety disorders will increase the sensitivity of the outcome measure, increasing the likelihood of detecting parent depression-child anxiety associations.

Another direction for future research is to examine other indicators of parental depression than current depressive symptoms, such as severity of depressive episodes or total

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duration of depressive episodes, in relation to child anxiety outcomes. Hammen and Brennan (2003) found severity of maternal depressive episodes to be the best predictor of subsequent depression in children. Interestingly, however, their results suggested a possible association between longer duration of mild maternal depression and occurrence of youth non-depressive disorders, including anxiety disorders; however, the sample size precluded analyses of specific non-depressive disorders. Theoretically, it is possible that children who experience over long periods of time the vacillation between parental intrusiveness and withdrawal that characterizes depression may become anxious as a consequence of the unpredictability of their parents' behavior. Thus, both severity and duration of parental depression should be considered in future studies examining the role of parenting in the development of child anxiety. By refining our measurement of depression, unique relationships between specific parameters of parental depression and child anxiety may emerge.

Due to the high comorbidity of depression and anxiety in both children and adults, future studies examining the relation of parental depression and child anxiety should control for comorbid parental anxiety and child depression. Without controlling for the symptoms of these comorbid disorders, associations between parental depression and child anxiety may be explained by their co-occurrence or overlap. For example, after controlling for panic disorder, Biederman et al. (2006) did not find a significant relation between parental depression and child anxiety. When comparing their findings to those of other investigators who found significant associations but did not control for comorbid parent anxiety disorders, Biederman et al. (2006) hypothesized that the comorbid anxiety disorders may have accounted for the difference. Beginning to control for comorbid parental anxiety and child depression will also help to

illuminate if the inverse relation between parental depression and child anxiety found in the current study is replicated in other samples or was in fact spurious in nature.

Finally, future research should continue to compare parent and child reports of parenting behaviors to parenting behaviors observed in interaction tasks to help explain the discrepant findings in the current study between observed parental warmth and child-reported parental positive involvement on the APQ. Moreover, future studies should utilize longer tasks, as well as a variety of types of interaction tasks, as a means to potentially better capture the parenting behaviors of interest in the current study.

The results of the current study do not support an intergenerational model of the transmission of parental depression to child anxiety through the mechanism of parenting practices, as very limited support was found for the hypothesized links of the proposed mediation model. Moreover, two of the three significant relations that were found were in a direction counter to that expected in light of previous research. It is important to note, however, that a formal test of a transmission model of psychopathology from parent to child requires prospective, longitudinal studies that explicitly focus on parenting behaviors as mediators. Thus, future studies using such designs to link research in the areas of parental depression, parenting, and child anxiety should help to illuminate some of the unexpected findings of the current study.

CHAPTER 5: REFERENCES

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