STRESS, NEGATIVE COGNITIVE STYLE, AND COPING

AS PREDICTORS OF DEPRESSIVE SYMPTOMS

IN CHILDREN OF DEPRESSED PARENTS

By

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BACKGROUND

Research has demonstrated the increased risk for psychopathology among children of depressed parents. Compared to children in the general population, an estimated 50% of children of depressed parents develop their own depression by adulthood (Hammen, Burge, Burney, & Adrian, 1990) and children of depressed parents have been shown in longitudinal studies to experience a two to sixfold higher risk of developing psychopathology, ranging from mood and anxiety disorders to substance dependence (Weissman, Wickramaratne, Nomura, Warner, Pilowsky, & Verdeli, 2006). Research has examined sources of risk and resilience for these children, often with the goal of understanding etiology or identifying targets for intervention or prevention in order to reduce the risk for the children in these families (Goodman, 2007). With an estimated 10 to 15 million American children under the age of eighteen living with a parent who has had a depressive episode in the past year, the gravity of this problem and the importance of identifying ways to reduce their risk for psychopathology is clear (England & Sim, 2009).

Various processes that confer this increased risk on children of depressed parents have been identified, and include biological and genetic predispositions, interpersonal processes, and psychological processes (Goodman & Gotlib, 1999). Children's coping and negative cognitive style are two important psychological characteristics of children of depressed parents that have been the subject of past research to examine how they are

related to symptoms of psychopathology in this at-risk population. The current study

focuses on these two psychological processes, both of which have been examined in

relation to exposure to stress in children and adolescents, with a small number of studies

focusing on these processes in offspring of depressed parents.

Growing up with a depressed parent is a stressful, and often chronically stressful,

experience because depression tends to recur (Weissman & Olfson, 2009). Parents with

depression experience impairment in various aspects of their lives, including impairment

in relationships with family members, specifically their children. Interactions between

children and their depressed parents are characterized in two ways. Parents with

depression can be withdrawn from their children and seem uninvolved or they can be

intrusive and overly controlling (Lovejoy, Graczyk, O'Hare, & Neuman 2000). An

example of a withdrawn parent is one who returns home every evening from work and

goes straight to bed, leaving her children to fend for themselves for dinner and

homework. An intrusive parent may be quite irritable and critical with her children when

they misbehave. Ultimately, what can make these interaction styles stressful for children

is that many depressed parents vacillate between these two patterns, and often in

unpredictable ways (Hammen, Brennan, & Shih, 2004; Jaser et al., 2005; Jaser, Fear,

Reeslund, Champion, Reising, & Compas, 2008; Langrock, Compas, Keller, Merchant, &

Copeland, 2002). Exacerbating the situation, in addition to being unpredictable, these

patterns of parental behavior are chronic, as past research has shown that parents with a

history of depression often continue to exhibit negative withdrawn and intrusive

parenting behaviors even when they are not in an episode of depression (Langrock et al.,

2002; Lee & Gotlib, 1991).

Coping

Identifying the ways in which children react to and cope with the stress of living with a depressed parent has been and continues to be an important area of research. Coping is broadly defined as "conscious, volitional efforts to regulate emotion, cognition, physiology and the environment in response to stressful events or circumstances," (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). Research has shown that certain coping strategies are more effective when dealing with the uncontrollable stress associated with living with a depressed parent. Such coping strategies include acceptance, distraction, and cognitive reappraisal, all of which comprise secondary control coping. Secondary control coping refers to efforts to adjust one's thoughts, emotions, or physiological reactions to the stressor, rather than trying to change the stressor itself (Compas et al., 2001; Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000).

Past research with children of depressed parents has demonstrated lower levels of internalizing symptoms, including depressive symptoms, in children who utilized more secondary control coping strategies, compared with children who did not utilize these strategies (e.g., Fear et al., 2009; Jaser et al., 2005, 2007, 2008; Langrock et al., 2002). Additionally, a recent family group preventive intervention study conducted by Compas et al. (2009) targeted secondary control coping in children of depressed parents by teaching the children specific skills (acceptance, distraction, and cognitive restructuring) to manage the stress associated with their parents' depression. The children in the family group condition had significantly lower depressive and anxious symptoms at follow up time points up to 12 months after their initial assessments as compared to children in an

information only condition, and the effects of the intervention were mediated in part by increases in children's use of secondary control coping skills (Compas et al., 2010a).

Research by Silk, Shaw, Forbes, Lane, and Kovacs (2006) with children of depressed parents showed a link between children's use of emotion regulation skills that are closely linked to secondary control coping, and their internalizing symptoms. Children who were observed as able to increase positive emotion during an adverse, negative emotion inducing laboratory-based task had lower levels of internalizing problems. It is possible that these children were more successful at pursuing and engaging in enjoyable activities in order to generate positive emotions even in difficult and stressful times (Silk et al., 2007). Strategies such as distraction and cognitive reappraisal may underlie or enable this ability to up-regulate positive emotions (Compas et al., 2010b).

Disengagement coping, in contrast to secondary control coping, refers to responses that are oriented away from the stressor or one's emotions or thoughts regarding the stressor. This type of coping includes the following behaviors: cognitive and behavioral avoidance, denial, and wishful thinking (Compas et al., 2001; Connor-Smith et al., 2000). Unlike secondary control coping, prior research with children and adolescents has determined disengagement coping to be related to higher levels of depressive symptoms, and thus this type of coping may be an additional source of risk for these children (e.g., Compas et al., 2001; Wadsworth & Compas, 2002; Connor-Smith et al., 2000). However, recent research with children of depressed parents has not found significant correlations between disengagement coping and depression symptoms (e.g., Jaser et al., 2005, 2007; Langrock et al., 2002). Other research has shown that the use of

more passive emotion regulation strategies by children of depressed parents is related to greater adjustment problems and lower abilities to reduce feelings of sadness and anger (e.g., Garber, Braafladt, & Weiss, 1995; Garber, Braafladt, & Zeman, 1991; Silk, Steinberg, & Morris, 2003). Consistent with these findings, disengagement coping can be conceptualized as a more passive way of coping with a stressor and may be related to higher levels of depressive symptoms.

These studies provide evidence of relationships between two types of coping strategies (secondary control and disengagement) and depressive symptoms in children and adolescents of non-depressed and depressed parents. All of these studies tested coping as a mediator of the relations between stress and depressive symptoms but none tested coping as a moderator that could change the relationship between stress and symptoms. Gaining an understanding of how coping interacts with stress in the relationship with children's psychopathology can inform research in this field. For example, Wadsworth and Compas (2002) investigated relationships between the stress of economic hardship, coping, and adolescent outcomes to clarify the role of coping in these relationships and found no evidence of coping as a moderator of the connection between stress and adolescent psychopathology symptoms. Conversely, Connor-Smith and Compas (2004) found evidence of secondary control coping as a moderator of the relationships between stress reactivity (both self-reported and physiological responses in a lab task) and health outcomes and internalizing symptoms in a sample of college students. This study also found evidence for disengagement coping as a moderator between heart rate reactivity in a stressful lab task and health status, yet it was also positively related to internalizing problems. The authors concluded that disengagement

coping might be beneficial in the short term when used with uncontrollable stress, as was the case with the participants in this laboratory study (Connor-Smith & Compas). These studies suggest that secondary control and disengagement coping may serve as moderators between stress and outcomes in adolescents. Additional research is needed to help clarify the role of coping as a moderator of the effects of stress.

Negative Cognitive Style

Cognitive vulnerability in children of depressed parents has also been widely studied as a possible mechanism of risk in children of depressed parents. Throughout this research, cognitive vulnerability has been defined in several ways, based on separate conceptual models and means of measurement (Lakdawalla, Hankin, & Mermelstein, 2007). For the current study, cognitive vulnerability is defined and assessed based on the Hopelessness theory of depression (Abramson, Metalsky, & Alloy, 1989) and is characterized as a general negative cognitive style or way of thinking about the self and the world (Hankin & Abramson, 2002). The term negative cognitive style refers to how a person thinks about causes, consequences, and the implications for one's self after a negative event occurs (Hankin & Abramson). The tendency to interpret causes of adverse events as stable (things will always be this way), global (this negative event affects many arenas of life), and internal (this happened because of something about one's self) characterizes negative attributional style. Negative cognitive style adds two additional elements to negative attributional style by including expectations of other negative consequences after an adverse event and negative implications for one's self as a result of

the adverse event (e.g., something is wrong with the self because this event happened; Hankin & Abramson).

Another conceptualization of cognitive vulnerability used in past research is that of negative self-schema, which refers to general negative beliefs about the self that are associated with a lower sense of self-worth and self-efficacy (Hammen, 1988). Negative self-schema are reflected in the negative implications about one's self after a negative event, which are included in the definition of negative cognitive style. By encompassing attributional style plus these additional elements, negative cognitive style integrates several definitions of cognitive vulnerability that have been previously applied in research, and is thus a more comprehensive measure of cognitive vulnerability (Hankin & Abramson, 2002).

Several studies have established a link between parental depression and children's cognitive vulnerability. In one of the first studies to examine cognitive vulnerability in children of depressed parents, Jaenicke, Hammen, Zupan, Hiroto, Gordon, & Adrian et al. (1987) found that children of unipolar depressed mothers exhibited greater levels of negative attributional style and more negative self concept than children of mothers with bipolar disorder, medical illness, and no physical or mental disorder. Garber and Robinson (1997) found similar results, demonstrating that children of depressed mothers exhibited more negative attributional style and more negative automatic thoughts than children of non-depressed mothers. Additionally, with greater chronicity of their mothers' depression, children had more negative automatic thoughts and greater negative attributional style than children whose mothers had less chronic depression (Garber & Robinson). This more depressogenic attributional style remained significantly different

for children of chronically depressed mothers when controlling for children's current depressive symptoms (Garber & Robinson).

The findings of these studies are consistent with studies using experimental tasks to examine cognitions with children of depressed parents. Dearing and Gotlib (2009) found that healthy (i.e., no current or past Axis I disorders) but at-risk daughters of depressed mothers interpreted emotionally ambiguous words and stories in a negative manner after a sad mood induction. This study provided further evidence of a cognitive bias or vulnerability in children of depressed parents, independent of current depressive symptoms. Taylor and Ingram (1999) conducted a study of cognitive reactivity using an experimental task and found that children of depressed mothers displayed an increased recall of information pertaining to a negative self-image when a negative mood was induced compared to children of non-depressed mothers. In this study, similar to other studies previously discussed, this increased recall of negative information in the high-risk group was independent of children's current depressive symptoms. Considering the stress associated with living with a depressed parent, it is possible that children experience negative mood much of the time they interact with their depressed parents, so possibly, this tendency towards negative information processing is frequently activated in these children (Taylor & Ingram). These studies emphasize the significance of this risk factor, as it occurs in this high-risk group more frequently than children of non-depressed parents even if the children are not experiencing depression.

In addition to these studies that demonstrated children of depressed parents to be more likely to show signs of cognitive vulnerability, other studies have confirmed the association between cognitive vulnerability and children's depressive symptoms in

children of depressed parents. Hammen (1988) found children's negative self-schemas (one aspect of negative cognitive style) and stress created an additive risk of depressive diagnoses in a group comprised of high-risk and low-risk children (i.e., children of parents with depression, bipolar disorder, medical illness, and children whose parents had no mental or physical disorder) over a 6-month time period. This study found no interaction between stress and cognitive vulnerability; rather, each of these variables represented a significant main effect in predicting depressive symptoms. Like others, this study also controlled for the children's initial and current depression levels at each assessment to assure that the negative self-schemas were not simply another symptom of depression, but rather a separate vulnerability factor.

Garber, Keily, and Martin (2002) conducted a longitudinal study to assess children of depressed and non-depressed mothers (77% of mothers had history of a depressive disorder) starting in the 6th grade with follow-up through 11th grade and found that higher levels of negative attributional style (an aspect of negative cognitive style) and stress at the first time point predicted higher levels of parent and child-reported depressive symptoms at that initial assessment after controlling for child gender and maternal depression history. Moreover, increases in attributional style and stress longitudinally predicted increases in children's depressive symptoms over time, again when controlling for child gender and maternal depression history. This study used growth models to examine these trajectories over time and did not specifically examine an interaction between stress and attributional style.

A recent study by Morris, Ciesla, and Garber (2008) examined the interaction between stress and cognitive vulnerability in a sample of children at variable risk for

psychopathology; some were high-risk because their mothers had a history of depression (77%) and some whose mothers had no history of psychopathology were considered low-risk. This study found that various operational definitions and measures of cognitive vulnerability at an initial assessment (hopelessness, low self-worth, and negative attributional style) predicted depressive symptoms in children at the second assessment that occurred sometime in the following school year, regardless of their level of risk (i.e., their mothers' depression status). This study also found evidence of a cognitive-stress diathesis, in that an interaction between stress and a composite of all the cognitive vulnerabilities assessed was predictive of depressive symptoms at the second time point.

As shown in the results of the Morris et al. (2008) study and as discussed in the conceptualization of negative cognitive style in adolescents (Hankin & Abramson, 2002), the interaction between stress and negative cognitive style is an important aspect of this source of vulnerability for depression. Although Hankin and Abramson (2002) examined a community sample of high-school adolescents (i.e., parental depression status was not taken into account), the results showed an interaction between stress and negative cognitive style in predicting depression, such that at higher levels of stress, more negative cognitive style predicted higher levels of depression. By including stress in these studies, negative cognitive style has been conceptualized as a cognitive-stress diathesis, which may provide a more complete model of this risk factor.

Coping and Negative Cognitive Style

Research has shown how cognitive vulnerability and coping are each individually related to depressive symptoms in children of depressed parents, but the relationships

between these processes have received relatively little attention. Several studies have examined the link between cognitive vulnerability and coping as they predict depression in varied samples but not in children of depressed parents. For example, in a study of depressed women, Burns, Shaw, and Croker (1987) found that willingness to cope and cognitive distortion were independent and significant predictors of depression and together, willingness to cope and cognitive distortion accounted for 55% of the variance in depressive symptoms. The women in this study who had higher levels of cognitive distortion reported less willingness to cope, and they had more depressive symptoms, all of which were measured concurrently via questionnaires. This study shows some preliminary evidence of a relation between cognitive vulnerability and coping, but the use of the construct of willingness to cope does not address questions related to specific coping strategies the women in this sample utilized.

Another study analyzed reports of specific coping strategies and attributional style as they predicted depression symptoms, hostility, and flu-like symptoms in a sample of college students over the course of a college semester (Hemenover & Dienstbier, 1998). In this study, lower social support seeking (a type of coping) was correlated with more negative attributional style, but only negative attributional style was predictive of depressive symptoms; social support seeking did not affect the relationship between attributional style and depressive symptoms. Also, this study found avoidant coping to be positively related to depressive symptoms, but it was not related to negative attributional style (Hemenover & Dienstbier).

Finally, a cross-sectional study of children who had experienced residential fires by Ollendick, Langley, Jones, and Kephart (2001) also did not find a significant

relationship between avoidant coping and attributional style, but this study did find that avoidant coping, attributional style, and negative life events were all significant and independent predictors of levels of fear experienced by the children.

Building on these findings, prior studies of children of depressed parents have acknowledged that children's cognitive vulnerabilities may interfere with their ability to cope effectively with stress, (e.g., Goodman & Gotlib, 1999; Hammen, 1988) but none have directly tested that hypothesis in a sample of children of depressed parents. Moreover, both negative cognitive style and coping are closely tied to stress. This established shared connection to stress provides further rationale for examining how these two processes affect one another. Understanding how a child thinks about stressful events, as part of his or her cognitive style, is important, but knowing how those types of thinking may be related to what that child does to respond to stressful events, how that child copes, can also be very informative to the study of this high-risk population.

How might negative cognitive style be related to coping? Understanding how negative cognitive style is related to a child's thoughts about negative or stressful events can begin to elucidate the connections between two sources of risk in children of depressed parents. First, negative cognitive style encompasses negative attributional style, which means a child interprets the causes of adverse events as stable (things will always be this way), global (this negative event affects many arenas of life), and internal (this happened because of something about the self). Two other key aspects of negative cognitive style refer to a child's expectations for future stressful events to occur, and a child's belief that because a negative event occurred, something is flawed about him or herself. These ways of thinking may lead a child to believe that he or she has little or no

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control over stressful situations or his or her reactions to those situations, to believe that other negative events will occur, and there is no possibility that the situation will change. Thus, this style of thinking can lead a child to feel hopeless when faced with stress. If a child feels hopeless, it is possible he or she may be a more passive responder to stressful or negative events. The child may also be less motivated to engage with the stressor or with his reactions to the stressor, and as a result, he or she may engage in fewer active coping strategies, such as secondary control coping, and more passive coping strategies, such as disengagement coping. As a result, it is possible that coping may modify or moderate the effects of negative cognitive style on depressive symptoms.

Current Study

The current study was designed to both replicate and extend prior studies. Similar to prior research, this study examines types of coping strategies used by children of depressed parents and how those strategies relate to their depressive symptoms. This study also analyzes the relationship between stressors and cognitive style and how those relate to depressive symptoms. It goes a step further than prior studies by examining how coping is related to the previously established stress-diathesis relationship between negative cognitive style and stressors.

Based on prior research, the current study tested hypotheses regarding the relations between stress, coping and negative cognitive style in a sample of children of parents with a history of depression. First, we hypothesized that higher levels of stress would be associated with higher levels of negative cognitive style. Second, we hypothesized that children exposed to more stressors related to their parents' depression

and higher levels of negative cognitive style would have greater levels of depressive symptoms. Third, we hypothesized that children who use more secondary control coping strategies and less disengagement coping would have fewer depressive symptoms. Fourth, we hypothesized an interaction between stress and negative cognitive style in predicting depressive symptoms, such that at higher levels of stress, negative cognitive style would predict higher levels of depressive symptoms. Our fifth hypothesis was that an interaction would emerge between stress and coping in predicting depressive symptoms, such that secondary control coping would act as a protective factor at high levels of stress, and disengagement coping would cause a stronger relationship between stress and depressive symptoms at higher levels of stress.

In addition to these relationships that have been supported in previous research, we hypothesized several additional relationships that incorporate coping into the relationships between stress, negative cognitive style, and depression. Our sixth hypothesis was that children with higher levels of negative cognitive style would use active coping strategies (secondary control coping) less frequently and would use passive (disengagement) coping more frequently. Seventh, we hypothesized that stress, negative cognitive style, and each type of coping (secondary control and disengagement) would all predict depressive symptoms. Eighth, we hypothesized an additional interaction between coping and negative cognitive style, such that at lower levels of secondary control coping and higher levels of disengagement coping, the relationship between negative cognitive style and depressive symptoms will be stronger or more pronounced. Our ninth and final hypothesis was that a three-way interaction would emerge among stress, cognitive style, and coping as predictors of depressive symptoms. We hypothesized that secondary

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control coping would act as a protective factor such that there would be a significant interaction between stress and negative cognitive style in predicting depressive symptoms for children with low levels of secondary control coping but not for children with high levels of secondary control coping. We also hypothesized that high levels of disengagement coping together with high levels of stress and negative cognitive style would predict higher levels of depressive symptoms than lower disengagement coping with high stress and high negative cognitive style.

CHAPTER II

METHOD

Participants

Table 1 provides demographic data on the sample for this study. The sample

consisted of 166 children (ages 9-15-years-old) and their parents. All parents had

experienced at least one episode of major depressive disorder (MDD) during the lifetime

of their child, with a median of 3 episodes of MDD during their child's lifetime. One

hundred forty-eight of the parents were mothers and 18 were fathers with a mean age of

41.80 years. Eighty two percent of the parents were Euro-American, 11.4% were African

American, 1.2% were Asian American, 2.4% Hispanic American, 0.6% were American

Indian or Alaska Native and 2.4% were mixed ethnicity. Annual household income for

the families ranged from below $5,000 to over $180,000, with mean annual income

between $40,000 and $60,000. Education levels for the parents ranged from less than

high school to completion of a graduate program: 5.4% of the parents had not completed

high school, 9.6% had a high school education, 30.4% had received a degree from a

technical school or had completed at least one year of college, 31.9% had received a

degree from a 4 year college, and 22.9% had completed graduate education. Sixty one

percent of parents were married, 21.7% were divorced, 5.4% were separated, 10.8% had

never married, and 1.2% were widowed.

Table 1. Demographic variables of Parents and Children

	Parents (*n* =166)	Children (*n* = 166)
Age [mean (SD)]	41.80 (7.55)	11.50 (1.99)
Race [*n* (%)]		
White	136 (81.9)	122 (73.5)
African-American	19 (11.4)	23 (13.9)
Asian-American	2 (1.2)	4 (2.4)
Hispanic-American	4 (2.4)	3 (1.8)
American-Indian/Native Alaskan	1 (0.6)	1 (0.6)
Mixed Ethnicity	4 (2.4)	13 (7.8)
Annual Family Income [*n* (%)]		
Less than $5,000	11 (6.6)	
$5000-$9999	6 (3.6)	
$10,000-$14,999	3 (1.8)	
$15,000-24,999	17 (10.2)	
$25,000-39,999	34 (20.5)	
$40,000 – 59,999	28 (16.9)	
$60,000– $89,999	32 (19.3)	
$90,000 – $179,999	23 (13.9)	
$\geq$ $180,000	5 (3.0)	
Education [*n* (%)]		
Some high school	9 (5.4)	
Graduated high school	16 (9.6)	
Some college or technical school	50 (30.1)	
Graduated college	53 (31.9)	
One or more years graduate school	38 (22.9)	
Marital Status [*n* (%)]		
Married/Living with Someone	101 (60.8)	
Divorced	36 (21.7)	
Separated	9 (5.4)	
Never Married	18 (10.8)	
Widowed	2 (1.2)	

Children in the sample included 83 boys (mean age = 11.54 years) and 83 girls (mean age = 11.46 years). Seventy four percent of children were Euro-American, 13.9% were African American, 2.4% were Asian American, 1.8% Hispanic American, 0.6% were American Indian or Alaska Native and 7.8% mixed ethnicity. In order to identify a sample of children at-risk for depression, children were screened and excluded from the

study if they met criteria for major depressive disorder (see below). In families with more than one child in the targeted age range, one child was randomly selected for inclusion in the analyses to avoid possible problems of non-independence of children within the same family.

Measures

Parental depression diagnoses. Parents' past and current history of MDD was assessed and other Axis I disorders were screened with the Structured Clinical Interview for DSM (SCID; First et al., 2001), a semi-structured diagnostic interview used to assess current and previous episodes of psychopathology according to DSM-IV criteria (American Psychiatric Association, 1994). Inter-rater reliability, calculated on a randomly selected subset of these interviews, indicated 93% agreement (*kappa* = 0.71) for diagnoses of MDD.

Children's and adolescents' depressive symptoms. The Child Behavior Checklist (CBCL) and the Youth Self-Report (YSR) were used to assess children's symptoms of depression. Reliability and validity of the CBCL and YSR are well established (Achenbach & Rescorla, 2001). The Affective Problems scale was used in the current analyses as an index of children's depressive symptoms. Internal consistency for the scales used in this study were α = .72 for the CBCL and α = .81 for the YSR. Nine and 10 year-old children completed the YSR to allow for complete data on all measures. The internal consistency for the YSR scales was adequate with this younger age group in the current sample (all alphas $\geq$ .75). Raw scores on the CBCL and YSR scores were used in all analyses to maximize variance (i.e., some variability is lost when the raw scores are

converted to *T*-scores).

Children's depressive symptoms were also quantified using the Schedule for Affective Disorders and Schizophrenia for School-Age Children- Present and Lifetime Version (K-SADS-PL; Kaufman et al., 1997). The K-SADS-PL is a reliable and valid semi-structured interview that generates DSM-IV Axis I child psychiatric diagnoses. Separate interviews were conducted with parents and children and were combined to yield both current and lifetime psychiatric diagnoses. Inter-rater reliability for diagnoses of MDD, calculated on a randomly selected subset of these interviews, indicated 96% agreement (*kappa* = 0.76). The entire depression section of the K-SADS (i.e., both screener and supplement) was administered to all children in the study and their participating parents in order to obtain full information on any and all current depression symptoms the children were experiencing. For data analyses, each threshold symptom was scored as a 2, each subthreshold symptom was scored as a 1, and any symptom not present was scored as 0. These symptom scores were then summed to represent the children's total current depression symptoms on the K-SADS ranging from 0 to 18, giving more weight to a threshold symptom (coded a 2) than to a subthreshold symptom (coded a 1). The children in this sample were experiencing a mean of 2.11 (s.d. = 1.73) subthreshold symptoms of depression and a mean of 0.75 (s.d. = 1.11) threshold symptoms of depression, with a mean depressive symptoms score of 3.58 on the KSADS.

Parent-child reports of parental related stressors and children's coping. The parental depression version of the Responses to Stress Questionnaire (Connor-Smith et al., 2000; Jaser et al., 2005, 2008) was used to assess how the adolescents experienced and responded to stressors related to their parents' depression. Stressor items asked

adolescents to rate the frequency with which they had experienced various identified

stressful aspects of parental depression in the past six months (e.g., My mom seems to be

sad or cries a lot of the time; My mom does not want to do things with the family; My

mom is too upset, tense, grouchy, angry, and easily frustrated). Coping and stress

response items cover five factors of coping and stress responses: primary control

engagement coping, secondary control engagement coping, disengagement coping,

involuntary engagement/stress reactivity, and involuntary disengagement (Connor-Smith

et al., 2000). Adolescents and their parents were asked separately to rate each item with

regard to the degree/frequency with which the adolescent experienced and responded to

the identified stressors. To control for response bias and individual differences in base

rates of item endorsement, proportion scores were calculated by dividing the total score

for each coping and stress response factor by the total score for the entire RSQ (Vitaliano,

Maiuro, Russo, & Becker, 1987). A total stressor score was obtained by summing the

scores for the stressor items. Internal consistency for the stressors was $\alpha = .78$ for parent

report and $\alpha = .84$ for adolescent report.

Analyses focused on two coping strategies due to past research findings and

hypotheses in this study: secondary control coping (acceptance, positive thinking,

cognitive restructuring, distraction) because these are the coping skills that are best suited

for coping with uncontrollable stressors related to parental depression (e.g., Jaser et al.,

2005) and disengagement coping (avoidance, denial, wishful thinking) because of the

hypothesized associations of this type of coping with negative cognitive style. Internal

consistency for secondary control coping was $\alpha = .76$ for parent report and $\alpha = .80$ for

adolescent report and internal consistency for disengagement coping was $\alpha = .82$ for

parent report and $\alpha = .83$ for adolescent report. A separate composite measure was created for each scale (adolescents' stress, secondary coping, and disengagement coping) by converting scores from adolescent and parent reports to z-scores and calculating the mean z-score for each participant (stress composite: $\alpha = .86$, secondary control composite: $\alpha = .76$, disengagement composite: $\alpha = .83$).

Child and adolescent reports of negative cognitive style. The children's negative cognitive style was measured using the mean score on the children's report on the Adolescent Cognitive Style Questionnaire (ACSQ; Hankin & Abramson, 2002). This measure presents the child or adolescent with hypothetical negative events that were selected by the developers based on common experiences of childhood and adolescence. The original measure contains twelve situations, however, in this study, a shortened version of the measure was used, such that only four hypothetical situations were presented. The events used in the current study included "You get a bad report card for the semester", "You get in a big fight with your parents", "You don't get chosen for an extracurricular activity (such as a sports team, club, or play) that you want to be a part of", and "Someone says something bad about how you look". The situations that were excluded for this study included several experiences more common for older adolescents that would not have been appropriate for the younger children in this sample (e.g., "You don't get accepted to any colleges"; "You can't get a date for a big dance you want to go to").

The child is asked to write in a cause of the hypothetical experience then asked to rank on a scale of 1 to 7 whether the event happened because of something about him or herself (internal cause), whether the reason for the event will cause that same event to

continue happening (e.g., the reason for the bad report card this time will cause more bad report cards; stable cause), and whether the reason for the event will cause problems in other arenas (global cause). These first three items measure attributional style, with higher scores representing a more negative attributional style. The additional two items ask the child to rate (again on a scale of 1 to 7) whether other negative events will occur because this event occurred (inferences for consequences) and whether the negative event means something is wrong with him or herself (inferences for the self), with higher scores representing more negative inferences. An overall score on the ACSQ is obtained by computing the mean of all items for all the hypothetical events. The internal consistency reliability for the ACSQ has been shown in prior research to be quite high, which is one reason for its development, as prior measures of cognitive vulnerability in youth had lower internal consistency reliabilities. In this sample, internal consistency for the ACSQ overall mean was $\alpha = .90$, which reflects the findings of Hankin & Abramson (2002) in their original sample to test the psychometric properties of the measure ($\alpha = .95$).

Procedure

Upon expressing interest in the study, each parent completed an initial phone interview to begin to determine eligibility for the baseline assessment of the intervention study. If determined eligible from the phone interview, the family then participated in the baseline assessment in the laboratory to assess psychological history and ultimately determine eligibility for randomization into the intervention trial. These baseline

assessments included structured clinical interviews with the parent and the child and questionnaires completed by parent and child.

Families were screened to determine eligibility, primarily to discern that at least one parent in the family had experienced at least one major depressive episode or dysthymia during the child's lifetime. If two parents met criteria for depression or dysthymia, the parent who initially contacted the study was designated as the target parent. The following parental diagnoses or characteristics were permanently excluded from the sample: bipolar I, schizophrenia, or schizoaffective disorder. If a parent met criteria for current major depression accompanied by significant impairment (established by a Global Assessment of Function, GAF, score at or below 50) or acute active suicidal ideation, or drug or alcohol use disorders accompanied by significant impairment (GAF ≤ 50), the family was placed on hold temporarily and then re-assessed at a later time. If suicidal ideation or impairment had improved at time of re-assessment, the family was then eligible to participate in the intervention. Child diagnoses that led to exclusion from the study included mental retardation, pervasive developmental disorders, alcohol or substance use disorders, current conduct disorder, bipolar I disorder, and schizophrenia or schizoaffective disorder. Additionally, if a child in the family met criteria for current depression or was acutely suicidal, the family was placed on hold, and the same re-assessment procedure was applied as described above.

The Institutional Review Boards at Vanderbilt University and at the University of Vermont approved all procedures in the study. Doctoral students in clinical psychology completed extensive training for the structured clinical interviews and conducted all interviews in the Department of Psychology and Human Development at Vanderbilt

University and in the Psychology Department at the University of Vermont. All participants provided informed consent prior to participation in the study, and each participant received $40 compensation for their participation in the baseline assessments.

Data Analyses

Comparison of means. To test for gender differences in any of the variables of interest, *t*-tests of means were conducted on all variables (see Table 2).

Correlational analyses. To examine relationships between stress, negative cognitive style, secondary control coping, and disengagement coping, and depressive symptoms (as presented in the first, second, fourth, and fifth hypotheses), bivariate Pearson correlations were used (see Table 3).

Multiple linear regression analyses. To further examine how levels of stress, negative cognitive style, secondary control coping, and disengagement coping predict depressive symptoms, various multiple linear regressions were conducted using the YSR/CBCL composite Affective Problems and the KSADS MDD symptom score as dependent variables, see Blocks 1 through 3 in Tables 4 through 7. Additionally, as described in the fourth, fifth, eighth, and ninth hypotheses, interactions between predictor variables in predicting depressive symptoms were also tested using multiple linear regression, see Blocks 4 and 5 in Tables 4 through 7.

RESULTS

Descriptive Statistics

Means and standard deviations for all tested variables are presented in Table 2. Means and standard deviations were calculated on boys and girls separately and then on the sample as a whole. Due to prior research uncovering gender differences in negative cognitive style and depression (e.g., Hankin & Abramson, 2002; Morris et al., 2008) *t*-tests of means (also in Table 2) were conducted on all variables to test for gender differences, and none were significant. As a result, the sample as a whole was used for all other analyses and gender was not included in any of these analyses.

The mean on the ACSQ ($M = 2.88$) is comparable to that found in previous studies of negative cognitive style in adolescents. Hankin and Abramson (2002) found a mean score of 3.37 on the ACSQ in a general sample of high-school-age adolescents, and Kercher and Rapee (2009) found a mean score of 2.95 on the ACSQ in a community-based sample of seventh-grade students. The mean *T* score on the YSR Affective Problems Scale was 56.15 (*s.d.* = 7.69), and on the CBCL Affective Problems scale the mean *T* score was 60.39 (*s.d.* = 8.00), both of which are considered moderately elevated but below the clinical level of 70. A subgroup of children had scores on the affective symptoms scale at or above the clinical cut off of 70 (98th percentile) on the YSR (6.02%) and the CBCL (14.46%). These rates are 3 to 7 times higher than the rates (2%) found in the normative samples for these scales and suggest that this sample was at elevated risk

for depression. These data on the Affective Problems scale *T* scores are provided to help characterize this sample, and they provide additional evidence of the high-risk nature of this sample of children. It is important to note, however, that in order to maximize variance the raw scores on these measures were used in all other analyses.

Table 2. Descriptive statistics and between gender t-tests for children's coping, negative cognitive style, and depressive symptoms

	Entire Sample (*n* = 166) Mean (SD)	**Girls** (*n* = 83) Mean (SD)	**Boys** (*n* = 83) Mean (SD)	*t* value (d.f)	*p*
Child Stressors (Child Report)	9.65 (6.29)	9.98 (5.82)	9.32 (6.73)	-.68 (164)	.50
Child Stressors (Parent Report)	13.08 (5.44)	13.65 (5.03)	12.52 (5.80)	-1.34 (164)	.18
Child Negative Cognitive Style	2.88 (1.07)	2.82 (1.09)	2.94 (1.06)	.67 (164)	.50
Child Secondary Control Coping (Child Report)	0.24 (.05)	.23 (.05)	.24 (.04)	1.37 (164)	.17
Child Secondary Control Coping (Parent Report)	0.22 (.05)	.21 (.05)	.22 (.05)	.53 (164)	.60
Child Disengagement Coping (Child Report)	0.20 (.03)	.20 (.03)	.21 (.04)	1.36 (164)	.18
Child Disengagement Coping (Parent Report)	0.20 (.03)	.19 (.03)	.20 (.04)	.43 (164)	.67
YSR Affective Problems *T* Score	56.15 (7.69)	55.67 (7.45)	56.62 (7.94)	.79 (161)	.43
CBCL Affective Problems *T* Score	60.39 (8.01)	61.10 (7.98)	59.67 (8.02)	-1.15 (163)	.25
KSADS Symptoms of MDD	3.58 (3.05)	3.95 (3.16)	3.22 (2.91)	-1.56 (164)	.12

Bivariate Correlation Analyses

Bivariate correlation analyses are presented in Table 3. As predicted by the first hypothesis, higher levels of stress (parental withdrawal and intrusiveness) correlated positively with negative cognitive style ($r = .21, p < .01$). Relevant to the second hypothesis, higher levels of stress (parental withdrawal and intrusiveness) were positively related to adolescents' depressive symptoms (composite Affective Problems scale: $r = .35, p < .001$; K-SADS Symptoms of MDD: $r = .38, p < .001$), and negative cognitive style was positively related to depressive symptoms (composite Affective Problems scale: $r = .36, p < .001$; K-SADS Symptoms of MDD: $r = .27, p < .01$). Higher levels of stress were positively related to disengagement coping ($r = .44, p < .001$) and negatively related to secondary control coping ($r = -.31, p < .001$). As predicted by the third hypothesis, secondary control coping was negatively related to depressive symptoms (composite Affective Problems scale: $r = -.50, p < .001$; K-SADS Symptoms of MDD: $r = -.35, p < .001$) and disengagement coping was positively related to depressive symptoms (Affective Problems scale: $r = .19, p < .05$). Also following our fifth hypothesis, negative cognitive style was positively related to disengagement coping ($r = .19, p < .05$) and negatively related to secondary control coping ($r = -.20, p < .05$).

Table 3. Bivariate Correlation Analyses

	1	2	3	4	5
1. Stressors	--				
2. Negative Cognitive Style	.21**	--			
3. Secondary Control Coping	-.31***	-.20*	--		
4. Disengagement Coping	.44***	.19*	-.17*	--	
5. YSR/CBCL Affective Problems	.35***	.36***	-.50***	.19*	--
6. KSADS Symptoms of MDD	.38***	.27**	-.35***	.04	.51***

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

Linear Multiple Regression Analyses

Linear multiple regression analyses were conducted to test the remaining hypotheses. These results are presented in Tables 4 through 7.

Analyses of Main Effects. Four models tested the main effects of stress, negative cognitive style, and secondary control and disengagement coping as predictors of depressive symptoms. Blocks 1 through 3 in Table 4 present the main effects of stress, negative, cognitive style, and secondary control coping predicting depressive symptoms measured by the YSR/CBCL Affective Problems Composite and Blocks 1 through 3 in Table 5 present the main effects with KSADS MDD symptoms score as the dependent variable. In Block 3 in Tables 4 and 5, all three independent variables were independent and significant predictors of depressive symptoms. Stress was a significant predictor of depressive symptoms for the Affective Problems ($\beta = .17$, $p < .01$) and the KSADS symptoms score ($\beta = .27$, $p < .001$). Negative cognitive style was a significant predictor of depressive symptoms on both measures (Affective Problems: $\beta = .24$, $p < .001$; KSADS MDD Symptoms: $\beta = .16$, $p < .05$), and secondary control coping was also a significant predictor of depressive symptoms on both measures (Affective Problems: $\beta = -.40$, $p < .001$; KSADS MDD Symptoms: $\beta = -.23$, $p < .01$).

As seen in Blocks 1 through 3 in Tables 6 and 7, an additional linear regression model tested main effects of stress, negative cognitive style, and disengagement coping predicting depressive symptoms. Block 3 in Table 6 shows the main effects, and when the YSR/CBCL Affective Problems scale composite was used as the dependent variable, stress ($\beta = .28$, $p < .001$) and negative cognitive style ($\beta = .29$, $p < .01$) were significant predictors, but disengagement coping was not ($\beta = .01$, n.s.). When the KSADS MDD

symptom score was entered as the dependent variable, as seen in Block 3 of Table 7,

stress (β = .41, p < .001) and negative cognitive style (β = .22, p < .01) were significant

predictors, as was disengagement coping (β = -.19, p < .05). It is noteworthy that the beta

weight is negative for disengagement coping in this model of main effects, despite the

non-significant bivariate correlation between disengagement coping and depressive

symptoms on the K-SADS, reflecting a suppressor effect.

Analyses of Two-Way Interactions. To test the hypothesized two-way interactions,

predictor variables relevant to each interaction were centered and multiplied to create

each interaction term, and the interaction terms were entered as independent variables to

predict depressive symptoms (Aiken & West, 1991).

The hypothesized interaction between stress and negative cognitive style in

predicting depressive symptoms measured by the YSR/CBCL Affective Problems

composite is seen in Block 4 in Tables 4 and 6 (β = .06, *n.s.*) and in predicting K-SADS

MDD symptoms in Block 4 in Tables 5 and 7 (β = .09, *n.s.*). In neither case was the stress

by cognitive style interaction as significant predictor of depressive symptoms. The

interaction between stress and secondary control coping was also tested as it predicts

depressive symptoms on the YSR/CBCL Affective Problems composite in Block 4 in

Table 4 (β = -.03, *n.s.*), and this interaction was tested as it predicts K-SADS MDD

symptoms in Block 4 in Table 5 (β = -.04, *n.s.*); neither interaction was significant. The

additional two-way interaction between stress and disengagement coping was used to

predict depressive symptoms on the YSR/CBCL Affective Problems composite (β = -.12,

n.s.) and on the K-SADS (β = -.15, *n.s.*), and again, neither interaction was significant.

Finally, the two-way interactions between negative cognitive style and coping were tested

in Block 4 of Tables 4 through 7. In Block 4 of Table 4, the interaction between negative cognitive style and secondary control coping was used to predict depressive symptoms on the YSR/CBCL Affective Problems composite ($\beta = .01$, *n.s.*), and in Block 4 of Table 5 this interaction was used to predict K-SADS MDD symptoms ($\beta = .05$, *n.s.*). Block 4 of Table 6 shows the interaction of negative cognitive style and disengagement coping predicting YSR/CBCL Affective Problems ($\beta = .02$, *n.s.*) and Block 4 of Table 7 shows this interaction predicting K-SADS MDD symptoms ($\beta = .10$, *n.s.*). Each of these two-way interactions was tested with just its relevant main effects, and again, none of these were significant predictors of depressive symptoms on either the YSR/CBCL Affective Problems composite or the K-SADS MDD symptom score.

    Analyses of Three-Way Interactions. The same procedure was used to create three-way interaction terms as described above for two-way interaction terms. The three-way interaction was tested in Block 5 of Tables 4 through 7. In Tables 4 and 5, the three-way interaction was between stress, negative cognitive style, and secondary control coping (Affective Problems: $\beta = .02$, *n.s.*; K-SADS MDD Symptoms: $\beta = .07$, *n.s.*), and the interaction was not significant. In Tables 6 and 7, the three-way interaction was between stress, negative cognitive style, and disengagement coping (Affective Problems: $\beta = -.20$, *n.s.*; K-SADS MDD Symptoms: $\beta = -.17$, *n.s.*), and the interaction was not significant.

Table 4. *Regression Analyses Testing Stress, Negative Cognitive Style, Secondary Control Coping, Two-Way, and Three-Way Interactions as Predictors of Affective Symptoms*

DV: CBCL/YSR Affective Symptoms

	β	sr^2
Block 1 $R^2 \Delta = .12$*		
Stress	.35***	.12
Block 2a $R^2 \Delta = .08$*		
Stress	.28***	.09
Negative Cognitive Style	.30***	.09
Block 2b $R^2 \Delta = .18$*		
Stress	.21**	.04
Secondary Control Coping	-.44***	.18
Block 3 $R^2 \Delta = .15$*		
Stress	.17*	.04
Negative Cognitive Style	.24***	.08
Secondary Control Coping	-.40***	.18
Block 4 $R^2 \Delta = .01$		
Stress	.15*	.03
Negative Cognitive Style	.23***	.07
Secondary Control Coping	-.42***	.18
Stress✕Negative Cognitive Style	.07	.01
Stress✕Secondary Control Coping	-.03	.00
Secondary Control Coping✕ Negative Cognitive Style	.01	.00
Block 5 $R^2 \Delta = .00$		
Stress	.15*	.03
Negative Cognitive Style	.23***	.07
Secondary Control Coping	-.42***	.18
Stress✕Negative Cognitive Style	.07	.01
Stress✕Secondary Control Coping	-.03	.00
Secondary Control Coping✕ Negative Cognitive Style	.01	.00
Stress✕Negative Cognitive Style ✕Secondary Control Coping	.02	.00

Final Model $R^2 = .33$***

Note. Model values are Adjusted R^2. β = standardized beta; sr^2 = semi-partial correlation squared. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5. *Regression Analyses Testing Stress, Negative Cognitive Style, Secondary Control Coping, Two-Way, and Three-Way Interactions as Predictors of K-SADS MDD Symptoms*

DV: K-SADS MDD Symptoms

	β	sr^2
Block 1 $R^2 \Delta = .14$*		
Stress	.38***	.14
Block 2a $R^2 \Delta = .04$		
Stress	.34***	.11
Negative Cognitive Style	.20**	.04
Block 2b $R^2 \Delta = .06$		
Stress	.30***	.08
Secondary Control Coping	-.26**	.06
Block 3 $R^2 \Delta = .05$		
Stress	.27***	.08
Negative Cognitive Style	.16*	.03
Secondary Control Coping	-.23**	.06
Block 4 $R^2 \Delta = .01$		
Stress	.25**	.06
Negative Cognitive Style	.16*	.03
Secondary Control Coping	-.26**	.07
Stress✕Negative Cognitive Style	.09	.01
Stress✕Secondary Control Coping	-.04	.00
Secondary Control Coping✕ Negative Cognitive Style	.05	.00
Block 5 $R^2 \Delta = .00$		
Stress	.24**	.05
Negative Cognitive Style	.15*	.03
Secondary Control Coping	-.27**	.07
Stress✕Negative Cognitive Style	.09	.01
Stress✕Secondary Control Coping	-.05	.00
Secondary Control Coping✕ Negative Cognitive Style	.04	.00
Stress✕Negative Cognitive Style ✕Secondary Control Coping	.07	.01

Final Model $R^2 = .21$***

Note. Model values are Adjusted R^2. β = standardized beta; sr^2 = semi-partial correlation squared. * $p < .05$. ** $p < .01$.*** $p < .001$.

Table 6. *Regression Analyses Testing Stress, Negative Cognitive Style, Disengagement Coping, Two-Way, and Three-Way Interactions as Predictors of Affective Symptoms*

DV: CBCL/YSR Affective Symptoms

	β	sr^2
Block 1 $R^2 \Delta = .12$***		
Stress	.35***	.12
Block 2a $R^2 \Delta = .08$***		
Stress	.28***	.08
Negative Cognitive Style	.30***	.08
Block 2b $R^2 \Delta = .00$		
Stress	.32***	.08
Disengagement Coping	.05	.00
Block 3 $R^2 \Delta = .00$		
Stress	.28**	.06
Negative Cognitive Style	.29***	.08
Disengagement Coping	.01	.00
Block 4 $R^2 \Delta = .01$		
Stress	.30***	.07
Negative Cognitive Style	.29***	.07
Disengagement Coping	.01	.00
Stress × Negative Cognitive Style	.06	.00
Stress × Disengagement Coping	-.12	.01
Disengagement Coping × Negative Cognitive Style	.02	.00
Block 5 $R^2 \Delta = .01$		
Stress	.32***	.08
Negative Cognitive Style	.33***	.08
Disengagement Coping	.06	.00
Stress × Negative Cognitive Style	.12	.01
Stress × Disengagement Coping	-.03	.00
Disengagement Coping × Negative Cognitive Style	.02	.00
Stress × Negative Cognitive Style × Disengagement Coping	-.20	.01

Final Model $R^2 = .19$***

Note. Model values are Adjusted R^2. β = standardized beta; sr^2 = semi-partial correlation squared. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 7. *Regression Analyses Testing Stress, Negative Cognitive Style, Disengagement Coping, Two-Way, and Three-Way Interactions as Predictors of K-SADS MDD Symptoms*

<u>DV: K-SADS MDD Symptoms</u>

	β	sr^2
Block 1 $R^2 \Delta = .14$*		
Stress	.38***	.14
Block 2a $R^2 \Delta = .04$		
Stress	.34***	.11
Negative Cognitive Style	.20**	.04
Block 2b $R^2 \Delta = .02$*		
Stress	.45***	.16
Disengagement Coping	-.16*	.02
Block 3 $R^2 \Delta = .03$*		
Stress	.42***	.14
Negative Cognitive Style	.22**	.04
Disengagement Coping	-.19*	.03
Block 4 $R^2 \Delta = .02$		
Stress	.44***	.15
Negative Cognitive Style	.19*	.03
Disengagement Coping	-.20*	.03
Stress ✕ Negative Cognitive Style	.08	.00
Stress ✕ Disengagement Coping	-.15	.01
Disengagement Coping ✕ Negative Cognitive Style	.10	.01
Block 5 $R^2 \Delta = .01$		
Stress	.46***	.15
Negative Cognitive Style	.22**	.04
Disengagement Coping	-.15	.02
Stress ✕ Negative Cognitive Style	.13	.01
Stress ✕ Disengagement Coping	-.08	.00
Disengagement Coping ✕ Negative Cognitive Style	.10	.01
Stress ✕ Negative Cognitive Style ✕ Disengagement Coping	-.17	.01

Final Model $R^2 = .20$*

Note. Model values are Adjusted R^2. β = standardized beta; sr^2 = semi-partial correlation squared. * $p < .05$. ** $p < .01$. *** $p < .001$.

CHAPTER IV

DISCUSSION

The current study replicated and extended the findings of previous research

regarding stress, negative cognitive style, and coping in a sample of children of depressed

parents. Our first hypothesis was supported as we found higher levels of parent and child

reported stress related to parental depression (i.e., parental withdrawal and intrusiveness)

to be significantly and positively related to children's self reported negative cognitive

style. Considering the stressful home environment that children of depressed parents

often experience (Hammen, et al., 2004), this finding is potentially important, as it shows

additional evidence for cognitive vulnerability in children of depressed parents, and

particularly those children under the highest levels of stress in their interactions with their

parents (e.g., Garber & Robinson, 1997; Jaenicke et al., 1987).

Consistent with our second hypothesis, we found that higher levels of stress and

higher levels of negative cognitive style were significantly positively correlated with

depressive symptoms. Also, stress and negative cognitive style were independent and

significant predictors of depressive symptoms in multiple linear regression analyses,

together accounting for anywhere from 15-18% of the variance in depressive symptoms,

depending on measurement method of symptoms. In the correlations and regressions,

depressive symptoms were measured by a composite of the YSR and CBCL Affective

Problems scale and K-SADS MDD symptoms. These ways of measuring depressive

symptoms represent multiple informant methods (i.e., parent and child reports), which

reduce the likelihood of these findings resulting solely from the use of a single informant and follow recommendations for using multiple informants in the study of children of depressed parents (Goodman, 2007; Kraemer, Measelle, Ablow, Essex, Boyce, & Kupfer, 2003). These findings replicate prior research that has shown a positive relationship between levels of stress and depressive symptoms in children of depressed parents (e.g., Jaser et al., 2005; Langrock et al., 2002) and research that has found a positive relationship between cognitive vulnerability and depressive symptoms in children of depressed parents (e.g., Garber et al., 2002; Hammen, 1988; Morris et al., 2008).

Related to our third hypothesis, higher levels of secondary control coping were related to fewer depressive symptoms on the questionnaire (CBCL, YSR) and interview (K-SADS) measures, which replicates prior findings of this relationship (e.g., Jaser et al., 2005, 2007, 2008; Langrock et al., 2002). This relationship was seen in correlation and regression analyses. Our third hypothesis also predicted disengagement coping to be positively related to depressive symptoms. This hypothesized positive relationship between disengagement coping and depressive symptoms has been supported in some previous studies with prior samples of children, adolescents, and college students (e.g., Compas et al., 2001; Wadsworth & Compas, 2002; Connor-Smith et al., 2000), yet it has not been supported in other samples of offspring of depressed parents (e.g., Jaser et al., 2005, 2007; Langrock et al., 2002). The current study, like other studies of children of depressed parents, did not find conclusive evidence that more disengagement coping is related to more depressive symptoms. Disengagement coping was weakly positively correlated with depressive symptoms measured on the questionnaires, but not with depressive symptoms measured by the interviews. One possible explanation for the lack

of a consistent relationship between disengagement coping and depressive symptoms is that this type of coping may have a weaker effect on symptoms in children of depressed parents as compared to children and adolescents in the general population (Jaser et al., 2007).

Since prior studies had found a significant interaction between stress and a comprehensive measure of cognitive vulnerability in predicting depressive symptoms (e.g., Hankin & Abramson, 2002; Hankin, 2008; Morris et al., 2008), we included this interaction as our fourth hypothesis. Unlike these previous studies, we did not find a significant interaction in the current study in our multiple linear regression analyses predicting depression symptoms on the questionnaire or the interview measures. Additional prior studies have found inconsistent evidence of this stress by cognitive vulnerability interaction when using a more comprehensive measure of cognitive vulnerability (Abela & Sarin, 2002). Therefore, the weakest link hypothesis was suggested as an explanation for the interaction between cognitive vulnerability and stress (Abela & Sarin). This hypothesis posits that the aspect of negative cognitive style that is most depressogenic for an individual (i.e., that individual's "weakest link") will interact with stress to predict symptoms of hopelessness depression (Abela & Sarin). For example, if a person scores highest on the attributional style measure of negative cognitive style, and has lower scores on negative inferences for self and consequences, that person's weakest link would be attributional style, and according to the hypothesis, attributional style would interact with stress to predict depression for that individual. In fact, Abela and Sarin (2002) found evidence of this hypothesis in a sample of seventh grade children, and Morris et al. (2008) also found evidence of this hypothesis in a

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sample of children of depressed parents. Perhaps the more comprehensive measure of negative cognitive style in this study may have contributed to the lack of support for the hypothesized interaction. Another possible explanation may lie in the way stress was conceptualized. The studies that did find significant interactions used more comprehensive measures of stress, rather than stress specifically due to parental depression reflecting the construct in the current study. Additionally, a few studies that found a significant stress by cognitive vulnerability interaction were longitudinal (e.g., Hankin, 2008; Morris et al., 2008), and since the current study is cross-sectional, the true nature of the stress-diathesis (i.e., stress interacts with, and in a sense "activates" pre-existing negative cognitive style) may not be captured in the design of the current study.

The current study did not support our fifth hypothesis, which stated an interaction between stress and coping would predict depressive symptoms, such that at high levels of stress, higher levels of secondary control coping would act as a protective factor, and higher levels of disengagement coping would be related to even higher levels of depressive symptoms. Neither of these interactions was significant when predicting depressive symptoms on questionnaire or interview measures. These findings are consistent with past research that did not find evidence for coping as a moderator between stress and depressive symptoms (e.g., Wadsworth & Compas, 2002) yet they are contrary other studies that did provide evidence for coping functioning as a moderator (e.g., Connor-Smith & Compas, 2004). Of note, neither of these studies examined this interaction in children of depressed parents, so perhaps this interaction functions differently in different populations of children and adolescents. Additionally, prior work has shown that the detection of moderation in field studies such as ours (as opposed to

experimental studies) is difficult and rare (McClelland & Judd, 1993).

Our sixth hypothesis related the constructs of negative cognitive style and coping, and found a significant negative correlation between negative cognitive style and secondary control coping and a significant positive correlation between negative cognitive style and disengagement coping. As hypothesized, these relationships suggest that children with more negative cognitive style may be more likely to use more passive strategies to cope with stress (i.e., disengagement coping) and less likely to use more active strategies to cope with stress (i.e., secondary control coping). These findings are consistent with prior research that has found similar relationships in other samples (e.g., Hemenover & Dienstbier, 1998; Ollendick et al., 2001). However, the current study is the first of our knowledge to test this hypothesis using these models of cognitive vulnerability and coping in a sample of children of depressed parents. This finding is significant as it combines two previously separate areas of research on risk processes in children of depressed parents and helps provide a more complete picture of how these children think and cope in reaction to stress.

Mixed findings were obtained for our seventh hypothesis through our linear multiple regression analyses. As predicted, stress, negative cognitive style, and secondary control coping were all independent and significant predictors of depressive symptoms measured on questionnaires and interviews. Together, these three independent variables accounted for 30% of the variance in depressive symptoms measured on the questionnaires, and 17% of the variance in depressive symptoms measured via interviews. This finding shows that there may be multiple avenues for intervention or prevention work with children of depressed parents, including changing children's

negative cognitive style and coping. It will be important for the future prevention studies with children of depressed parents to incorporate all of these risk factors.

On the other hand, the findings for disengagement coping predicting depressive symptoms were not conclusive. With depressive symptoms measured by questionnaires as the dependent variable, disengagement coping was not a significant predictor in regression analyses, despite a weak positive correlation between disengagement coping and depression symptoms measured by questionnaires. This does not support our seventh hypothesis regarding disengagement coping as an additional significant and independent predictor of depressive symptoms alongside stress and negative cognitive style. When K-SADS depressive symptoms was the dependent variable in regression analyses, when disengagement coping was entered as an independent variable with stress and negative cognitive style, it had a negative, statistically significant beta weight. However, there was no correlation between disengagement coping and depression measured via the K-SADS. The lack of correlation and the beta weight in the opposite direction from what we hypothesized (and from the correlation between disengagement and depressive symptoms on the questionnaires) most likely indicate suppressor effects. Further interpretation of this finding is not recommended because it may be spurious and due to chance, as is generally the case with suppressor effects (Aiken & West, 1991).

Our eighth hypothesis posited that a significant interaction between negative cognitive style and coping in predicting depressive symptoms would emerge. This hypothesis was not supported for either type of coping nor for either way of measuring depressive symptoms. Despite the significant correlations between negative cognitive style and coping in the hypothesized directions (negatively related to secondary control

coping and positively related to disengagement coping), the hypothesized interactions were non-significant in linear multiple regression analyses. Again, this may be due to difficulty detecting significant interactions in field studies (McClelland & Judd, 1993). It is also possible that very few children in this study were high on secondary control coping and on negative cognitive style, further making such an interaction difficult to detect, since it is possible that a small portion of the sample exhibited one of the hypothesized patterns of scores that could have provided evidence for that interaction.

Finally, no evidence emerged to support our ninth hypothesis, of a three-way interaction among stress, negative cognitive style, and coping. No prior studies have examined or suggested such a relationship, yet we hypothesized that secondary control coping would interact with stress and negative cognitive style to produce a buffer effect whereby at high rates of stress and negative cognitive style and secondary control coping, lower depressive symptoms would result. The second part of this hypothesis suggested that higher levels of disengagement coping would serve to increase the relationship between the stress-diathesis and depressive symptoms. These three-way interactions were hypothesized based on findings of the stress-negative cognitive style two-way interaction in prior research (e.g., Hankin & Abramson, 2002; Hankin, 2008; Morris et al., 2008) combined with expected relationships between coping and negative cognitive style. Again, the lack of support for this relationship may be due to the fact that interactions in general are difficult to detect in non-experimental studies, with significant three-way interactions being rare (McLelland & Judd, 1993).

Limitations

Some limitations of this study include the cross-sectional design, making it impossible to infer conclusions regarding causality. As mentioned before, the stress-diathesis (i.e., the interaction between stress and negative cognitive style) may be better studied using a longitudinal design (e.g., Hankin, 2008), although a significant interaction has been found using a cross-sectional design (e.g., Hankin & Abramson, 2002).

Additionally, the sample is not representative of all children of depressed parents since the study screened out children with current depression and current conduct disorder, among other disorders. These characteristics were excluded since this study was part of a larger family group preventive intervention study, however, they do make this sample of children a slightly unique high-risk group. Since the larger preventive intervention study sought to prevent depression problems in the children, it was necessary to exclude children who had depression upon entrance into the study.

Finally, the inclusion of children as young as nine years old in the age range may have played a role in some of the non-significant but previously supported findings regarding negative cognitive style (i.e., non-significant interactions with stress). Much past research has focused on older children and adolescents to study negative cognitive style (e.g., Hankin & Abramson, 2002). One study of the developmental trajectory of the stress-diathesis found evidence that an interaction between attributional style (one part of negative cognitive style) and negative life events did not predict depression until the 8th grade, suggesting that cognitive vulnerability may not be fully established or trait-like until the age of 14 or 15, which is at the end of our study's age range (Cole et al., 2008). Further research to examine age differences in children's negative cognitive style, specifically in the younger children in

this sample may help elucidate these relationships with age. Nonetheless, our correlations and regressions do provide evidence that negative cognitive style is a significant predictor of depression in our sample of children.

Implications for Future Research

Future research should address several goals. First, other studies are needed to replicate the findings of relationships between negative cognitive style and coping. Additionally, other studies should focus on the hypothesized relationships between negative cognitive style and coping in order to further comprehend how these two processes interact and affect one another. Longitudinal studies will help clarify some of these hypothesized relationships and causality. Finally, although not included in the current study because it was not significantly different in any of the variables of interest, future studies should also examine how gender affects the findings of this study, since gender differences in negative cognitive style have been detected in other research (Hankin & Abramson, 2002).

In conclusion, the current study found significant relationships between stress, coping (both disengagement and secondary control), negative cognitive style, and depressive symptoms in a sample of children of depressed parents. Some of these findings replicate past research, while others are new contributions to the field. The significant and independent contributions of stress, both types of coping, and negative cognitive style to the prediction of depressive symptoms in this sample suggest the possibility of multiple avenues for prevention with this high-risk population of children. Future research is needed to replicate the new findings from this study and clarify inconclusive results and to better understand and ultimately provide help and care for children of depressed parents.

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