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**A Developmentally-Sensitive Evaluation of Two Cognitive Models of
Depression in Childhood and Early Adolescence**

by

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Dissertation

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Doctor of Philosophy

The University of Texas at Austin

May 2014

A Developmentally-Sensitive Evaluation of Two Cognitive Models of Depression in Childhood and Early Adolescence

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The University of Texas at Austin, 2014

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Abstract: This study used mediation analysis to evaluate Beck's model and Abramson's model in a sample of 198 girls, in the 4th through 7th grades. Data from diagnostic interviews were used to create a continuous measure of depressive symptoms. Self-report measures, including the Life Events Checklist, the Cognitive Triad Inventory for Children, and the Children's Cognitive Style Questionnaire, were used to assess perceptions of negative life events, Beck's cognitive triad, and Abramson's cognitive inferential style, respectively. Results of separate mediation analyses supported both Beck's and Abramson's cognitive theories of depression in children. There was a significant indirect effect of life events through Beck's cognitive triad on symptoms of depression. Similarly, there was a significant indirect effect of life events through Abramson's negative cognitive inferential style on depressive symptoms. Higher depressive symptoms were associated with a more depressotypic cognitive triad, a more depressotypic cognitive inferential style, and a greater number and greater magnitude of negative life events. Developmentally-sensitive analyses using the weakest link approach and moderated mediation (conditional process) analysis found support for both Beck's and Abramson's models. However, there was also some support for the developmental

hypothesis that in younger children negative life events can have a direct effect on symptoms of depression; for the 4th graders in this study, direct effects and indirect effects were significant. However, for the 5th, 6th, and 7th graders indirect effects were significant, but direct effects ceased to be significant. Implications and suggestions for future research are provided.

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CHAPTER 1: INTRODUCTION

Cognitive theories of depression, such as Abramson's hopelessness theory (Abramson, Metalsky, & Alloy, 1989) and Beck's cognitive theory (Beck, 1987) were originally designed to explain depression in adults. These theories share the same general hypothesis that the way one pays attention to, interprets, and remembers the experience of stressful life events contributes to the onset and recurrence of depression (Lakdawalla, Hankin, & Mermelstein, 2007). What distinguishes one cognitive theory of depression from another is the specific cognitive vulnerability factor, or diathesis hypothesized to predispose and individual to becoming depressed when faced with a stressful life event. For example, Abramson's theory¹ (Abramson et al., 1989) highlights the importance of a negative cognitive inferential style, whereas Beck's theory (Beck, 1987) focuses on depressotypic schemas and their resulting negative cognitive triad as potential diatheses for depression.

Through the years, from Beck's early characterizations of depression as a thought disorder to recent research, multiple studies of adults have found support for the general role of cognition in depression. However, downward extensions of these adult cognitive theories of depression to child and adolescent populations have not taken into account the role of cognitive development and, therefore, have achieved mixed results. The downward extension of these cognitive theories is relatively recent, and thus, few studies

¹ A note on terminology: This dissertation will be comparing and evaluating two models of depression that are parallel in structure: (1) Beck's Cognitive Model of Depression and (2) Abramson, Metalsky, & Alloy's (1989) Hopelessness Model of Depression. In order to keep the focus on the parallel structures of the two models, while still distinguishing their component parts, they may at times be referred to in parallel ways (e.g. "Beck's model" and "Abramson's model") for clarity. However, it should be understood that "Abramson's model" is in fact the product of three authors (i.e. Abramson, Metalsky, & Alloy) and that "Abramson's model" is much better known in the psychology literature under the shorthand "Hopelessness theory" of "the Hopelessness Model of Depression."

have adequately tested the causal chains hypothesized in Beck's and Abramson's theories with younger populations. The studies that have been conducted with youth have resulted in mixed, if not contradictory findings, suggesting a need for more studies in this area—perhaps using alternative methodologies or alternative conceptualizations of the component parts of each theory that take into account cognitive differences between adults and children.

Additionally, a few studies of the cognitive theory of depression with youth have found that the strength of the association between the cognitive vulnerability-stress interaction and depressive symptoms is smaller in children than in adolescents (Lakdawalla et al., 2007). This finding suggests that cognitive differences between children and adolescents also need to be taken into account.

Shirk (1988) has hypothesized that in young children, before cognitive patterns have developed into stable, trait-like styles, depressive symptoms may be the direct result of current, stressful life circumstances and not the result of an interaction between specific vulnerability factors and stress. However, Lakdawalla and colleagues (2007) have warned against discounting the role of cognitive vulnerabilities too soon, or even removing cognitive variables from etiological models of childhood depression, before addressing several key questions, such as “Do Beck's theory and hopelessness theory describe completely separate paths to childhood depression or are there overlaps in the underlying constructs of each theory?” and, more generally, whether or not cognitive developmental processes impinge on cognitive theories of depression (D'Alessandro & Burton, 2006).

One shortfall of many of the studies of cognitive theories of depression with children is the reliance on self-report questionnaires and the use of samples of children with predominately sub-clinical levels of symptoms. Supplementing these self-report

methods with clinical diagnostic interviews and using a sample that contains both clinically depressed and non-depressed children will enable a more complete evaluation of these theories.

An additional shortfall is that most studies have examined children of multiple ages as a single group. For example, a study might ask the question, “Does this theory explain depression in children ages 10-14?” which fails to take into account important changes in cognitive development that occur in children during the age range studied. (LaGrange et al., 2008).

When examining cognitive theories of depression, level of cognitive development of the children included in any given sample will have an impact upon whether or not support is found for each theory. In fact, one developmental approach, which calls for analyzing data separately for each grade level (or age) has found that the three component parts of Beck’s cognitive triad (i.e. negative views of the self, the world, and the future) and the three components of the depressogenic inferential style at the center of hopelessness theory (i.e. negative inferences about causes, consequences, and self-characteristics) develop separately at different points during childhood (LaGrange et al., 2008). In the case of hopelessness theory, it is not until adolescence that negative inferences about self-characteristics and about the causes and consequences of negative life events coalesce into a single, depressogenic inferential style. In adolescence and adulthood, the three components (or subscales used to measure them) are highly correlated with each other and can be viewed as a unit representing a unified concept that functions as a stable trait.

An examination of Piaget’s stages of cognitive development, in particular the shift from concrete to formal operations that occurs approximately around age 11-12, suggests that a young child may not be able to engage in the complex, abstract reasoning necessary

to make causal attributions about negative life events as envisioned in the causes component of hopelessness theory . (LaGrange et al., 2008). In some cases, this problem is made worse when measures of attributional style require the child to engage in hypothetical, abstract causal reasoning.

Additionally, if given a questionnaire measuring attributional style, the causal explanations a child assigns to explain a stressful life event may have a qualitatively different meaning with respect to Abramson's hopelessness theory of depression than if the same causal explanation came from a (more cognitively mature) adult. Alternatively, a very young child, when supplied with a list of possible causal explanations and asked to choose one, may simply choose the response that sounds most socially desirable.

However, theories of cognitive development suggest that a child may be able to make negative inferences about self-characteristics in response to a stressful life event (as envisioned in hopelessness theory) at a younger age than when she can make the causal attributional inferences which are also envisioned in hopelessness theory. Rather than throwing out an entire theory to explain and understand depression in children, researchers have developed a method for analyzing data that allows for an examination of the three components of Abramson's depressogenic inferential style (i.e. causal attributions, consequences, and self-characteristics) separately. This method, called the weakest link approach (Abela & Sarin, 2002), uses a child's most depressogenic inferential style (i.e. the highest score on a subscale measuring either causal attributions or consequences or self-characteristics) to test Abramson's hopelessness theory. This method allows researchers to identify (and therapists to address) the beginnings of a depressogenic inferential style (in a single domain) in younger children, even though they may not have yet developed depressogenic inferential styles in the other two domains. (Lakdawalla et al., 2007).

Unlike the developmental approach that calls for examining groups of data separated by individual age or grade in school (LaGrange et al., 2008), the weakest link approach allows for individual differences in the rates of cognitive development in children (Abela & Sarin, 2002). For example, one 11 year old may have entered the formal operations stage, while another 11 year old may still be thinking in mostly concrete ways about the world.

Beck's cognitive theory of depression has also received mixed support in child and adolescent populations. Similar to the findings in Abramson's hopelessness theory of depression, developmentally sensitive analyses of Beck's cognitive triad have found that its component parts (i.e. negative views of self, world, and future) may also develop at different points throughout a child's cognitive development. Specifically, one study found that negative views of the future as envisioned by Beck may develop at an earlier age than negative views of the self or the world (LaGrange et al., 2008). That is to say that views of the self and the world may remain developmentally protected domains in early middle childhood, even though negative views of the future are clearly present.

As with hopelessness theory, it appears that the three components of Beck's negative cognitive triad may not coalesce into a single unit that can be viewed as a stable trait until adolescence. (Lakdawalla et al., 2007). Therefore, the weakest link approach appears ideally suited to testing Beck's theory with child populations. Since no studies to date have used the weakest link approach to examine the three component parts of Beck's negative cognitive triad, this study used this new approach to test Beck's model. Additionally, analyses of Beck's negative cognitive triad using the traditional additive approach were conducted and the results of the two approaches were compared.

The three component parts of Abramson's negative cognitive inferential style were tested using the additive and weakest link approaches in order to (1) replicate

previous studies with younger populations that found significance for Abramson's model when using the weakest link approach, but not the additive approach and (2) obtain a parallel set of analyses and results to compare with the analyses and results using Beck's model. This made it possible to compare the constructs in the two theories (i.e. Beck's cognitive diathesis and Abramson's cognitive diathesis) to see if one model predicted depressive symptoms in the youngest children in the study and the other did not.

Beck's cognitive triad and Abramson's cognitive inferential style are similar enough to each other that problems with multicollinearity prevent testing the two constructs simultaneously in a multiple mediation model, which would have been the best way to conduct a formal test of differences between their specific indirect effects. However, conducting two, separate mediation analyses using the same sample, same independent variable, and same dependent variable could provide a loose framework for comparing the two constructs. Specifically, if one model is significant for all ages of children in the sample and the other model is significant only for the older children in the sample, that could suggest developmental differences in their utility for predicting depression. In summary, this study sought to evaluate Beck's cognitive model of depression and Abramson's hopelessness model of depression in a sample of depressed and non-depressed children and adolescents, using both the traditional and weakest link approaches in order to look for developmental differences between the two models.

CHAPTER 2: REVIEW OF THE LITERATURE

Depression in Children

Depression in children and adolescents is a common and recurring disorder that is associated with poor psychosocial outcomes, high risk of suicide, and the development of other psychopathologies. Symptoms of depression, which include a depressed mood and/or the loss of interest or pleasure in daily activities can lead to significant impairment in relationships and difficulties in everyday functioning. Because of its relationship to family stress, impaired school functioning, and the risk of death, depression in youth is considered a significant public health problem (Weisz, McCarty, & Valeri, 2006). Children diagnosed with major depressive disorder prior to puberty are three times more likely to attempt suicide in adulthood than non-depressed children (Weissman et al., 1999). Furthermore, even sub-syndromal levels of depressive symptoms in children can lead to considerable psychosocial impairment and the increased likelihood for developing major depressive disorder or suicidal ideation.

DIAGNOSTIC CRITERIA

With the exception of irritability with or without a depressed mood, which can be observed in depressed children, the criteria for a major depressive episode are the same for children as they are for adults (Mayes et al., 2007). As delineated in the Diagnostic and Statistical Manual of Mental Disorders, these criteria include five or more symptoms experienced in the prior two weeks, at least one of which must be a depressed mood most of the day (e.g. feeling sad or empty, or looking tearful), irritability, and/or a loss of interest or pleasure in most activities. Other symptoms include a decreased or increased appetite, insomnia or hypersomnia, psychomotor agitation or retardation, loss of energy or fatigue, feelings of worthlessness, feelings of inappropriate or excessive guilt,

diminished ability to think or concentrate, indecisiveness, and recurrent thoughts of death with or without a plan, or a suicide attempt. See Appendix A for a complete explanation of all of the criteria for a major depressive episode, Appendix B for the criteria for major depressive disorder—single episode, and Appendix C for the criteria for major depressive disorder—recurrent.

Dysthymic disorder, another subtype of depression, has a different presentation of symptoms than major depressive disorder. Dysthymic disorder is characterized by a persistent, long-term change to a depressed or irritable mood, lasting for most of the day on most days for one year or longer. The symptoms, which include changes in appetite or weight, changes in sleep patterns, problems with decision-making, low self-esteem, lack of energy, and feelings of hopelessness, are less intense in dysthymic disorder than major depressive disorder, but they may cause more psychosocial impairment. See Appendix D for a complete description of all of the diagnostic criteria for dysthymic disorder.

DEVELOPMENTAL FEATURES

Although many of the criteria for a major depressive episode are the same across the lifespan, the specific combination and degree of symptoms may have a different presentation in young children than in adolescents. For example, Kovacs (1996b) has noted more changes in appetite and weight, but less hypersomnia in young children than in adolescents. In addition, younger children who may not be able to verbalize feelings of depression may exhibit more somatic symptoms, social withdrawal, temper tantrums, mood lability, irritability, and a low tolerance for frustration (Kovacs, 1996b). However, Mayes (2007) has pointed out that differences in symptom presentation between children and adolescents may be difficult to detect and question in those differences exist at all.

EPIDEMIOLOGY

Although rates of depression in preadolescent children were originally believed to be low, increasing incidences of depression in children have been observed in recent years (Kessler, Avenevoli, & Merikangas, 2001). In childhood, approximately 2% of children have a diagnosable major depressive disorder. By adolescence, 10-30% of children exceed cutoff scores for elevated levels of depressive symptoms (Garrison, Jackson, Marsteller, & McKeown, 1990) and 4-8% of adolescents have a clinically diagnosable major depressive disorder. Adding to the concern about depression in adolescence, one study found that an additional 20% of girls age 11 to 16 reported high levels of depressive symptoms and distress, even though the threshold was not high enough to merit a clinical diagnosis of major depressive disorder (Cooper & Goodyer, 1993).

Gender differences in rates of depression in children have been observed, with higher, but statistically insignificant rates of depression in young boys than in young girls. Upon reaching and transitioning through adolescence, however, rates of depression diagnoses and symptoms are statistically significantly higher in girls than in boys (Patton et al., 2008; Twenge & Nolen-Hoeksema, 2002). Specifically, the male-to-female ratio for rates of depressive disorders changes from 1:1 in childhood to 1:2 in adolescence. The risk of developing a depressive disorder increases by a factor of 2 to 4 after puberty for females. These higher rates of depression appear to last throughout the remainder of the life course, with higher rates of depressive disorders diagnosed in women than in men.

DEVELOPMENTAL COURSE OF DEPRESSION

Although adolescence is often thought of as the age of onset for first symptoms of depression, studies have found the onset of major depressive disorder tends to be around age 11, with the onset of dysthymic disorder occurring at even younger ages in children

(Kovacs & Paulaukas, 1984). The mean time to recovery for major depressive disorder is often 7 to 9 months (Kovacs, 1996a); although the range of duration of depressive episodes is extremely wide, with approximately 10% of depressed children having prolonged episodes and the majority of children remitting in just a few months (Lewinsohn, Clarke, Seeley, & Rohde, 1994).

For children with dysthymic disorder, which can have a mean duration of up to 4 years, as many as 70% have double depression—meaning they proceed from having dysthymic disorder to developing episodes of major depression (Birmaher et al., 1996). As with adults, rates of recurrence of depression in adolescents are high, with as many as 40% having a recurrence over a period of 3 to 5 years (Lewinsohn et al., 1994). Onset of depressive disorders in childhood can lead to recurring episodes throughout the life course. Although it is difficult to ascertain the numbers of depressed children who specifically go on to experience major depression in adulthood, it is clear that the majority of depressed children do go on to experience high rates of psychological disorders in general and have problems with adjustment and functioning as adults (Harrington, Fudge, Rutter, & Pickles, 1990).

Theoretical Conceptualizations of Depression in Children

Although developmental psychopathologists understand there may be problems with uniformly applying adult models of depression to children, many theoretical models of depression in children started out as adaptations of adult models (Hammen & Rudolph, 2003). Types of models that have been used to understand depression in children include biological models, behavioral and interpersonal models, family models, life stress models, and cognitive models.

Life stress models of depression examine the relationship between negative life events and the development of depression. Diathesis-stress models of depression posit that stressful life events may trigger personal or cognitive vulnerabilities to depression. Multiple studies have found a connection between life stress and the development of depression in children of all ages from preschool through adolescence (Burt, Cohen, & Bjorck, 1988; Goodyer, Wright, & Altham, 1990; Kashani, Holcomb, & Orvaschel, 1986). However, the specific connection found between life stress and depressive symptoms has varied in studies of children of different ages: the onset and recurrence of a major depressive episode may be moderated or mediated by various life stressors.

Cognitive models of depression are based on the research of Aaron Beck and focus on the role of maladaptive or negative beliefs. Concepts that are central to Beck's cognitive theory of depression include automatic thoughts, cognitive schemas, and the negative cognitive triad. Briefly defined, automatic thoughts are errors or biases in thinking that lead to negative interpretations of events; negative cognitive schemas are internal structures that affect how depressed individuals process information and stimulate self-critical beliefs; and Beck's negative cognitive triad of self, world, and future refers to a depressed person's negative perceptions of the self being inadequate, the world being unfair, and the future being hopeless (Hammen & Rudolph, 2003).

Other cognitive models of depression focus on learned helplessness (Seligman, 1975), attributional style (Abramson, Seligman, & Teasdale, 1978) and hopelessness (Abramson et al., 1989).. Briefly defined, a depressogenic attributional style refers to a depressed individual's tendency to attribute positive outcomes to unstable, specific, and/or external factors and attribute negative occurrences to stable, global, and/or internal factors. The hopelessness theory of depression (Abramson et al., 1989) looks at the

interaction between negative life events that, similar to Beck's theory, lead to negative expectations about the future and ultimately the development of depressive symptoms.

Lakdawalla and colleagues (2007) note that multiple cognitive theories of depression are essentially vulnerability-stress models at their core, but that each theory has a different conceptualization of what constitutes a vulnerability to depression. For example, Beck's model (1967) posits that negative life events (i.e. the stress) generate specific negative cognitions about the self, world, and future (i.e. Beck's negative cognitive triad), which activates dysfunctional attitudes and leads to the elevation of depressive symptoms. In other words, depression arises as a result of a negative outlook derived from distorted cognitions and schema-driven processes.

Similarly, hopelessness theory (Abramson et al., 1989) posits that depression arises as a result of negative inferences about negative life events. However, unlike Beck's theory, hopelessness theory defines the vulnerability in the vulnerability-stress model as a depressogenic inferential style made up of three specific subtypes of inferences: causal attributional inferences about why a stressful life event occurred, including the utilization of stable and/or global attributions to explain why a negative life event occurred; negative inferences about self-characteristics given the occurrence of a stressful life event; and negative inferences about possible catastrophic consequences of a stressful life event.

BECK'S COGNITIVE MODEL OF DEPRESSION

Beck's cognitive model is based on the idea that information processing and meaning-construction influence all human emotional and behavioral experiences. Beck's cognitive theory falls under the rubric of a schema-based information-processing paradigm of human adaptation and functioning (Clark, 1999). The information processing

perspective holds that sensory data derived from both internal and external environmental cues are represented and transformed in meaning via cognitive structures, cognitive processes, and cognitive products. In other words, an information processing system is thought to filter, transform, encode, store, retrieve, and recreate sensory data through cognitive structures and processes.

Symbolic meaning representation is at the heart of Beck's cognitive theory, but these symbolic representations do not directly cause the subjective experience of depression. Rather, meaning representations lead to cognitions and judgments about the personal significance of a life event for an individual's sense of well-being. In turn, these cognitive products are hypothesized to mediate the relationship between symbolic representations and the actual experience of an emotional response.

Figure 1 shows an overview of Beck's cognitive model of depression from an initial activating negative life event to the development of depressive symptoms. Figure 2 shows Abramson, Alloy, and Metalsky's interpretation of Beck's cognitive model. Both interpretations of Beck's model are included here because one shows theoretical complexities that underpin the model (Figure 1), while the other (Figure 2) is simpler, more feasible to test, and more closely resembles the structure of the model to which it will be compared in this dissertation (i.e. Abramson's hopelessness model in Figure 3). More specifically, Figure 1 presents a detailed picture of Beck's own theoretical conceptualization, including latent elements that are not easily measured and processes that are so rapid they occur at a preconscious or pre-attentive level. Figure 2, however, more closely resembles the version of Beck's model to be tested in this dissertation and it includes a specific mention of negative cognitive triad, one of the key concepts to be measured and analyzed in this study.

Activating Event

As shown in Beck's cognitive model of depression in Figure 1, a negative life event is hypothesized to activate a cognitive schema, which in turn leads to the formation of negative thoughts (or other transient cognitive products, such as cognitive errors or negative appraisals), which in turn causes the individual to develop symptoms of depression. Many variations of the cognitive model begin with the experience of a stressful life event. What makes Beck's model stand out is that beyond highlighting the role of the stressful event as a catalyst, he notes that stressful events that lead to depression often involve themes of loss or perceived loss.

Orienting Schemas

Schemas are attitudes, beliefs, and assumptions which influence the way an individual experiences a situation. Orienting schemas, shown in Figure 1, are structures that screen information at a preconscious or pre-attentive stage. At the orienting level, information processing is rapid, involuntary, and outside of conscious awareness. The orienting schemas detect features of a situation or event that are relevant to the self (i.e. of significant importance or concern to the individual) and assign a preliminary meaning to the event. In the case of depressive disorders, orienting schemas have a bias toward detecting event features that are negative and reflect negatively on the self.

Cognitive Structures/Schema

Cognitive structures, also shown in Figure 1, are relatively enduring components of cognitive organization. They include meaning-assigning structures, such as a predepressive personality negative self-referent schemas, and the primal loss mode. The primal loss mode is characterized by a sense of deprivation, a loss of vital resources, a state of subjective dysphoria, a state of fatigue, a state of perceived helplessness, and/or a

response action plan characterized by inactivity. As with other elements of Beck's model, the concepts of negativity and the self recur. For example, negative self-referent schemas form the basis for Beck's negative cognitive triad (Kaslow, Stark, Printz, & Livingston, 1992).

Cognitive Products/Transient Processes

The transient products of depression-related cognitive structures include negative automatic thoughts (e.g. "I am unlovable"), cognitive errors (e.g. overgeneralization), biased cognitive appraisals (e.g. "it's all my fault"), and negative constructions and perspectives.

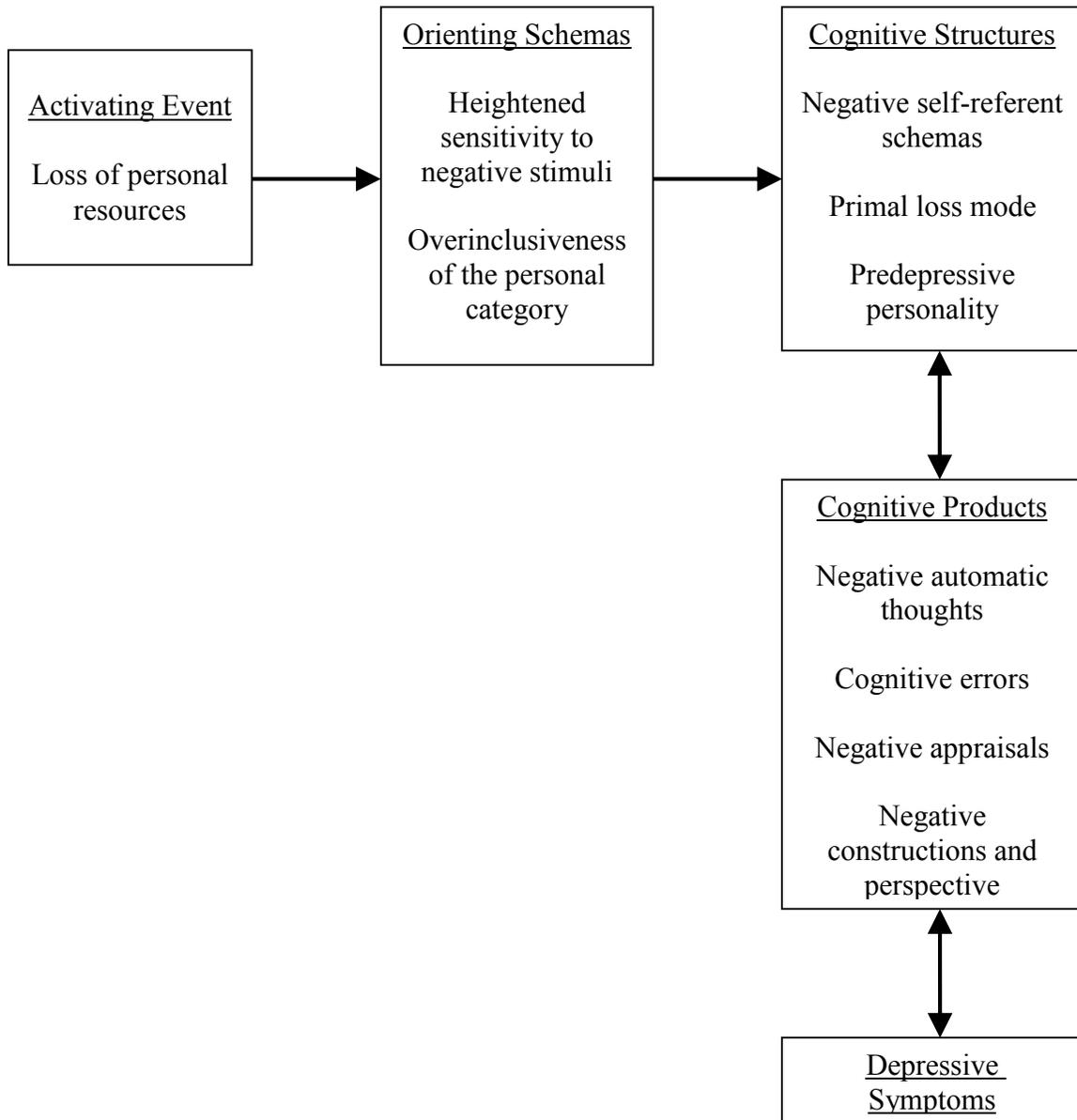


Figure 1. Overview of Beck's Cognitive Model of Depression
(Clark & Beck, 1999)

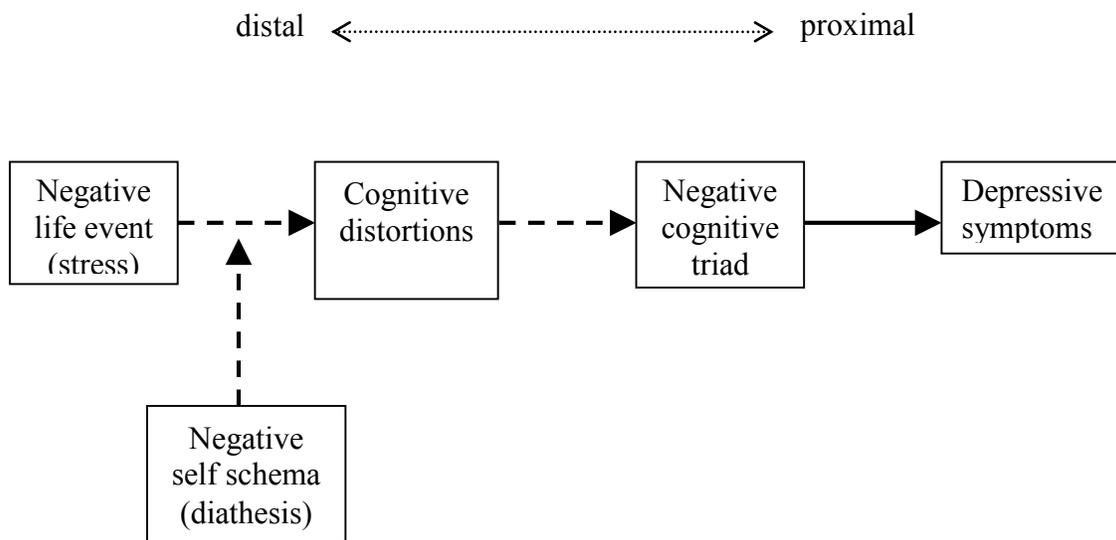


Figure 2. Causal Chain Implied in Beck's Cognitive Model of Depression
(Abramson, Alloy, & Metalsky, 1988)

Assumptions of Beck's cognitive model

The concepts and hypotheses that comprise Beck's cognitive theory of depression are derived from twelve theoretical assumptions. These assumptions are not intended to be held up as truths, but rather they are meant to clarify and define the boundaries of the cognitive model. More precisely, Beck states that any theoretical construct of depression (e.g. Abramson's depressogenic cognitive styles) may be considered a variant of the cognitive model so long as the construct is consistent with these twelve theoretical assumptions (Clark, 1999).

Beck's theoretical assumptions for his cognitive theory of depression are as follows:

1. The capacity to process information and form cognitive representations of the environment is central to human adaptation and survival.
2. Human information processing occurs at different levels of consciousness as a means of promoting its efficiency and adaptability.
3. A basic function of information processing is the personal construction of reality.
4. Information processing serves as a guiding principle for the emotional, behavioral, and physiological components of human experience.
5. Cognitive functioning consists of a continuous interaction between lower-order, stimulus driven processes and higher-order semantic processes.
6. Cognitive constructions are at best approximate representation of experience.
7. Meaning-assignment structures (schemas) develop through repeated interactions between the environment and innate rudimentary schemas.

8. The organization of meaning representation is characterized by different levels of conceptualization, with broader more general concepts encompassing lower more specific units of structure.
9. Meaning-making structures of the information processing system are characterized by different levels of threshold activation.
10. Two orientations are represented in the information processing system, the first aimed at the primary goals of the organism and the second aimed at secondary constructive goals.
11. Psychological disturbance is characterized by excessive and/or deficient activation of the specific meaning-assignment structures of the information processing system.
12. Modification of meaning-assignment structures is central to the human change process.

As will be shown later, several elements of Abramson's hopelessness theory of depression, as well as the model as a whole, are consistent with these theoretical assumptions. Therefore, Abramson's model can be considered a variation of Beck's cognitive model of depression.

Descriptive Hypotheses of Beck's Cognitive Model

To facilitate scientific research on the status of the cognitive model of depression, Clark and Beck (1999) have spelled out nine descriptive hypotheses and nine (causal) vulnerability hypotheses. The descriptive hypotheses examine cognitive functioning during a depressive episode in order to investigate the cognitive dysfunction that is characteristic of depression. Unlike the vulnerability hypotheses, the descriptive

hypotheses are not intended to be used to make inferences about the causal status of cognitive constructs.

The nine descriptive hypotheses of Beck's cognitive model of depression (Clark, 1999) are as follows:

1. The Negativity Hypothesis: Depression is characterized by the presence of absolute and pervasive negative self-referent thinking about the self, the world, and the future.
2. The Exclusivity Hypothesis: Depression is characterized by the exclusion of positive self-referent thinking.
3. The Content-Specificity Hypothesis: Each psychological disorder has a distinct cognitive profile that is evident in the content and orientation of the negative cognitions and processing bias associated with the disorder. (For example, themes of loss and deprivation are associated with depressive disorders, but themes of threat are associated with anxiety disorders.)
4. The Primacy Hypothesis: Negative cognition and biased information processing will critically influence the behavioral, affective, somatic, and motivational symptoms of depression.
5. The Universality Hypothesis: Heightened negative cognition, reduced positive thinking, and self-referent negativity processing bias are evident in all subtypes of depression.
6. The Severity and Persistence Hypothesis: Extent of negative self-referent cognition, reduced positive thinking, and negativity processing bias are linearly related to depression severity and persistence.

7. The Selective Processing Hypothesis: Depression is characterized by a selective processing bias for mood-congruent negative self-referent information that is linked to one's current life concerns.
8. The Schema Activation Hypothesis: Negative affective states like depression are characterized by an increased accessibility to the negative self-referent schematic structures of the loss mode.
9. The Primal Processing Hypothesis: The negative self-referent thinking, cognitive appraisals and perspectives in depression are the product of primal mode processing that is involuntary, unintended, rapid, and less amenable to conscious awareness.

Vulnerability Hypotheses of Beck's Cognitive Model

The nine vulnerability hypotheses of Beck's cognitive model, which can be used to examine causality, are as follows:

1. The Stability Hypothesis: The latent cognitive structures and content that contribute to susceptibility to depression are relatively stable across time, situations, and mood states, although they will remain inaccessible unless activated by a priming stimulus.
2. The Depression Onset Hypothesis: A negative event that matches the content of the pre-potent self-schemas and maladaptive personality constellation associated with the primal loss mode will lead to a heightened risk of depression onset in persons with no previous diagnosable depression.
3. The Depression Recurrence Hypothesis: A negative event that matches the content of the pre-potent self-schemas and maladaptive personality

constellation associated with the primal loss mode will lead to a heightened risk of recurrence of depression in previously depressed patients.

4. The Self-Evaluation Hypothesis: The cognitive structures and content that contribute to susceptibility to depression will guide self-perceptions, self-evaluations, and self-appraisals especially when elicited by schema-congruent situations.
5. The Congruent Processing Hypothesis: When activated, the cognitive structures and content that predispose for depression will selectively bias information processing for stimuli congruent with the cognitive vulnerability organization.
6. The Relationship Hypothesis: Cognitive structures and content that predispose for depression are associated with a characteristic interpersonal style that affects the quality and nature of social relations with significant others.
7. The Differential Coping Hypothesis: Maladaptive coping responses and compensatory strategies will play a more significant role in depression when personality-event congruence is present than when personality-event incongruence is present.
8. The Symptom Specificity Hypothesis: The pre-depressive personality suborganization associated with the primal loss mode will influence depressive symptom presentation such that sociotropy is associated with symptoms of deprivation and autonomy with symptoms of defeat and self-deprecation.
9. The Differential Treatment Hypothesis: The pre-depressive personality suborganization of the primal loss mode will influence attitudes and response to treatment such that the sociotropic individuals are more responsive to

interpersonally and emotionally engaging interventions, whereas autonomous persons are more responsive to less personal and more problem-focused intervention.

ABRAMSON'S HOPELESSNESS MODEL OF DEPRESSION

The origins of Abramson's hopelessness model of depression (Abramson et al., 1989) can be traced back to the theory of learned helplessness and attribution theory. The learned helplessness hypothesis (Seligman, 1975), which accounts for the debilitating effects of experiencing uncontrollable situations, posits that learning that outcomes are uncontrollable results in motivational, cognitive, and emotional deficits. When applied specifically to depression, the learned helplessness model of depression posits that learning that outcomes are uncontrollable results in symptoms of depression, including a depressed affect (Seligman, 1975).

This hypothesis was reformulated by adding an attributional framework to make it more applicable to humans than to animals. Specifically, the reformulated learned helplessness hypothesis (Abramson et al., 1978) posits that when a person finds that she is helpless, she tends to seek an explanation as to why she is helpless. In other words, she makes a causal attribution for her state of helplessness. When applied specifically to depression, the reformulated model states that the generality of depressive deficits will depend on the globality of attributions for helplessness, the chronicity of the depressive deficits will depend on the stability of the attributions, and depression-related lowered self-esteem will depend on the internality of the attribution for helplessness (Abramson et al., 1978).

In turn, the helplessness model of depression that relies on an attributional account of human helplessness and its implications for depression, was revised to become

the hopelessness model of depression (Abramson et al., 1989). Abramson's hopelessness model of depression (Figure 3) hypothesizes that there is a subtype of depression, called "hopelessness depression," with a specific set of symptoms. Additionally, the hopelessness model of depression deemphasizes the role of causal attributions (from earlier versions of the theory) by adding on inferred negative consequences and inferred negative characteristics of the self as possible contributors to the formation of hopelessness and in turn hopelessness depression.

Necessary, Sufficient, and Contributory Causes

The etiologic chain in Abramson's hopelessness model of depression (Abramson et al., 1989) is illustrated in Figure 3. The figure depicts a hypothesized causal chain from experiencing a negative life event to developing symptoms of depression. Abramson and colleagues clearly delineate the differences among necessary, sufficient, and contributory causes of depression in explaining their causal chain. They view these distinctions as important to understanding not only the causal chain in the hopelessness model of depression, but also to understanding the causal chain in Beck's model. (As can be seen in Figure 2, Abramson's interpretation of Beck's model suggests that all of the elements in his causal chain are contributory causes to the development of depressive symptoms, except for the negative cognitive triad, which they consider to be a sufficient cause of depression in Beck's model.)

All of the elements of Abramson's own causal chain from negative life events to hopelessness are also considered contributory causes, meaning their presence increases the likelihood that an individual will become depressed; however, their presence alone does not guarantee that an individual will become depressed and their absence does not preclude an individual from becoming depressed.

In contrast, the final step in the etiologic chain from hopelessness to the development of symptoms of hopelessness depression is considered a sufficient cause. As a sufficient cause, hopelessness is an etiologic factor whose presence guarantees the occurrence of depressive symptoms. That is to say that if hopelessness is present, depressive symptoms will occur. Additionally, if hopelessness depression symptoms do not occur, then hopelessness must not be present. However, hopelessness depression symptoms may occur without the presence of hopelessness.

The same logical relationship can be applied to Abramson's interpretation of Beck's model (Figure 2): if the negative cognitive triad is present, symptoms of depression will occur. If symptoms of depression do not occur, then the negative cognitive triad must not be present. However, symptoms of depression may occur without the presence of the negative cognitive triad. Abramson's interpretation of Beck's model is in keeping with Beck's contention that a cognitive diathesis (e.g. a depressogenic schema) must be primed by the experience of an adverse circumstance in order to lead to the development of depression. However, it remains to be seen in studies of childhood depression whether the negative cognitive triad is better conceptualized as depressogenic (i.e. causal and a sufficient cause of depressive symptoms) or as depressotypic, meaning a child will continue to hold negative views of the self, the world, or the future even after recovering from a depressive episode.

Situational Cues

Situational cues are considered a contributory cause in Abramson's model. The concept of situational cues is based on the co-variation principle that an effect will be attributed to a cause that is present when the effect is present and absent when the effect is absent. Situational cues related to a stressful life event, such as consistency, consensus,

and distinctiveness, can have an effect upon whether or not the interaction of the stressful life event and a depressogenic inferential style leads an individual to develop symptoms of depression. For example, an adolescent who fails a history test will be more likely to become depressed if she views the stressful event (i.e. failing the history test) as being highly consistent with past experiences (e.g. she has failed other history tests in the past), low in distinctiveness from past experiences (e.g. she has also failed math tests, science tests, and English tests in the past), and/or low in consensus, meaning she believes that she is one of the only students in the class to fail the test and that everyone else performed better.

Depressogenic Inferential Styles and Content

As the diathesis in Abramson's hopelessness model of depression, a depressogenic inferential style is the tendency to make negative inferences about the causes (i.e. attributions) and consequences of negative life events and to infer negative characteristics about the self in the face of negative life events. According to Abramson's model, individuals who make global stable attributions, infer negative characteristics about the self; and anticipate negative consequences when faced with negative life events are more likely to become depressed than individuals who do not have this depressogenic cognitive inferential style. These three facets of a depressogenic inferential style (i.e. causes, consequences, and self) are measured in the three subscale of the Children's Cognitive Style Questionnaire (CCSQ, Mezulis, Hyde & Abramson, 2006).

Causes

An attributional style is the tendency to make certain kinds of causal inferences, rather than others, across multiple situations, over time. Attributional content refers to the specific attribution an individual makes. (For example, she might attribute failure on a

task to ability or task difficulty.) In the context of the cognitive model of depression, a depressogenic attributional style, or a general tendency to attribute important negative events to stable and global causes, is considered a diathesis for depression.

Consequences

Independent of making causal attributions, inferred negative consequences of a stressful event can lead to depression. For example, a student may attribute failure on a college entrance exam to poor lighting in the testing room, which as an unstable, specific attribution is not hypothesized to lead to depression; but if she infers catastrophic consequences will result from the failure, such as being unable to obtain a college degree or to have the career she wants, then she is more likely to become depressed.

Self-Inferences

A person who infers negative characteristics about her own self-worth and abilities when faced with a negative life event is more likely to become depressed than someone who does not make these inferences.

Hopelessness

Hopelessness is viewed as a sufficient cause of hopelessness depression in Abramson's model. In this model, the authors clarify that the construct of hopelessness is not considered an affect (as in the colloquial phrase "I feel hopeless"). Rather, the construct of hopelessness in this model is defined as the combination of a negative outcome expectancy and a helplessness expectancy. In other words, hopelessness is conceptualized as the expectation that either a highly aversive outcome will occur or a highly desired outcome will not occur. And, in either case, the individual believes she is powerless to affect the outcome. Placing a high level of importance on an outcome over which she believes she is powerless can cause the individual to ruminate, which in turn

leads directly to two of the hypothesized symptoms of hopelessness depression: difficulty sleeping and difficulty concentrating.

Symptoms of Hopelessness Depression

The hypothesized symptoms of hopelessness depression include four motivational symptoms (i.e. psychomotor retardation, apathy, anergia, and retarded initiation of voluntary responses). These motivational symptoms are considered to be in inverse relationship with the construct of hopelessness, meaning the greater the level of perceived helplessness to affect an important outcome (i.e. the definition of hopelessness), the lower an individual's motivation to try cognitively, behaviorally, and physiologically will be. Additional symptoms of hopelessness depression include a sad affect, suicidal ideation and acts, lowered self-esteem, and mood-induced negative cognitions. Note in Figure 3 that outside of the pathway through hopelessness to depressive symptoms, there is a possible direct pathway from negative inferences about self-characteristics and/or internal attributions to lowered self-esteem.

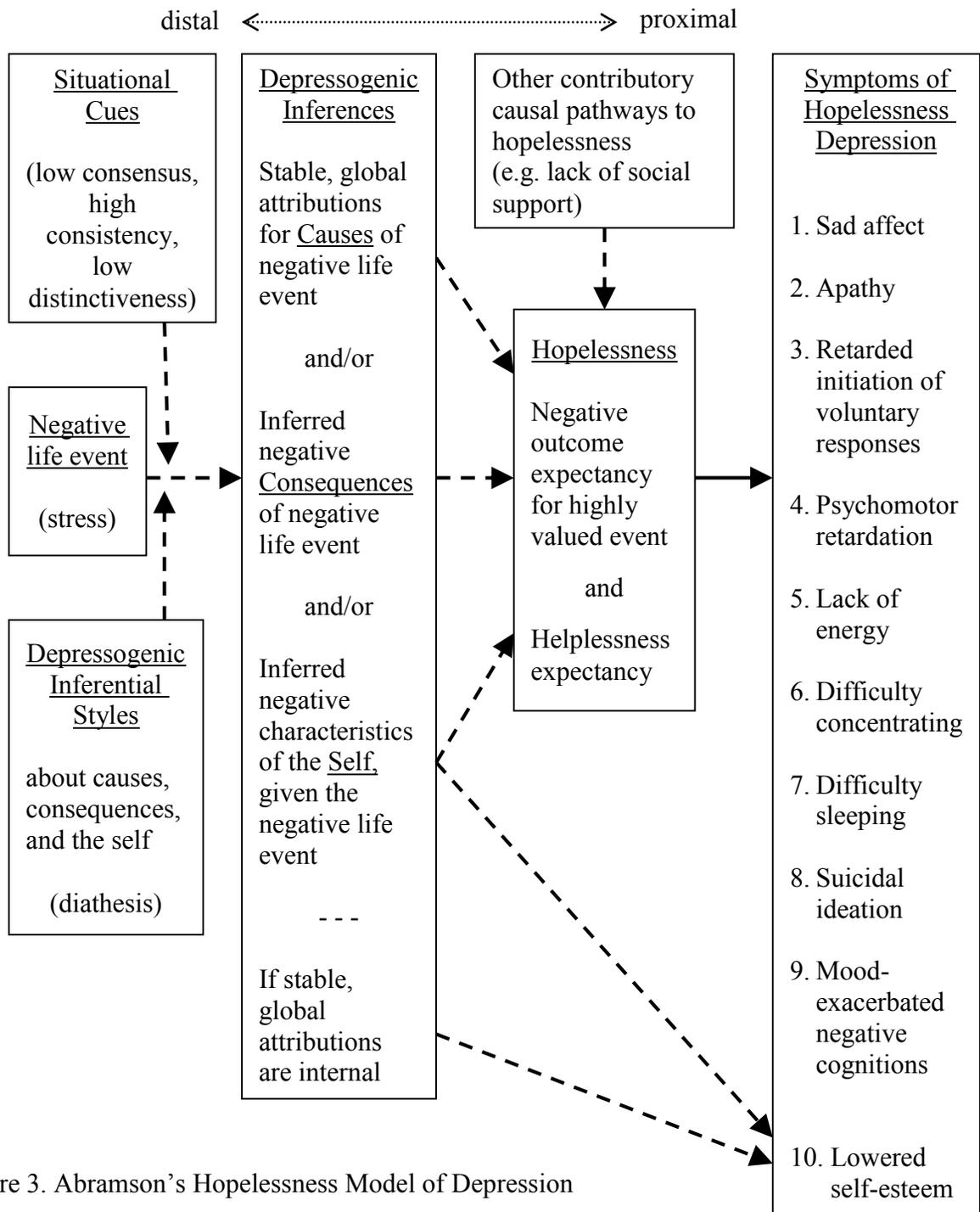


Figure 3. Abramson's Hopelessness Model of Depression

Dashed lines indicated contributory causal pathways. Solid line indicated sufficient causal pathways.

SIMILARITIES AND DIFFERENCES BETWEEN BECK'S AND ABRAMSON'S MODELS

Because Beck's model and Abramson's hopelessness model are both based on cognitive theories of depression, they are structurally similar. However, a systematic comparison of their cognitive components reveals key differences between the two models (Spangler, Simons, Monroe, & Thase, 1997). Both models hypothesize that cognitive variables interact with negative life events to precipitate depression and, therefore, are often described as diathesis-stress models of depression. Versions of both models have categorized cognitive variables and stress variables into two categories—an achievement domain and an interpersonal domain—and have hypothesized that depressive symptoms are most likely to occur when the domain of the stressful life event and the domain of an individual's cognitive diathesis match up.

Additionally, both models hypothesize that depression is a heterogeneous disorder that can be precipitated by a variety of different causal pathways. That is to say that both models allow for the possibility that alternative factors, such as genetics or a lack of social support, might lead to the onset of a depressive disorder, even in the absence of the specific cognitive diathesis-stress interaction at the core of each model. Interestingly, when it comes to defining the population of depressed persons resulting from the causal pathways described in both models, Abramson and others (Spangler et al., 1997) see a similarity between the two models, but Beck sees a difference (Clark, 1999).

Abramson's model is hypothesized to apply to only a subset of depressed persons with a specific constellation of symptoms that is labeled hopelessness depression. Abramson and colleagues say that Beck's model also only applies to a subset of depressed persons experiencing what they call negative cognitive triad depression. Furthermore, they coin the term negative cognition depression to describe a specific type

of depressive experience that they say represents the intersection between hopelessness depression and negative cognitive triad depression. Beck, however, rejects the concept of “negative cognition depression” and does not believe that the cognitive model of depression applies to only such a limited subtype of depressed persons (Clark, 1999). In fact, Beck’s Universality hypothesis specifically states that a negative self-referent cognitive organization, as described in his cognitive model, is applicable to all subtypes of depression.

The most important distinction between Beck’s model and Abramson’s model can be seen in the specific type of cognitive vulnerability featured in each model. Specifically, in Beck’s model, dysfunctional attitudes constitute the cognitive diathesis hypothesized to make an individual vulnerable to depression. In Abramson’s hopelessness model, however, three depressogenic inferential styles are hypothesized to make an individual vulnerable to developing depression: a global, stable attributional style, a tendency to make negative inferences about the self, and a tendency to assume catastrophic consequences will result from stressful events.

Qualitatively, these differing cognitive vulnerabilities between the two models of depression have been conceptualized as the difference between an attitude/outlook (i.e. Beck’s dysfunctional attitudes) and an explanation/judgment (i.e. Abramson’s depressogenic inferential styles). (Joiner & Rudd, 1996). From a developmental psychopathology perspective, these qualitative distinctions could be important for understanding depression in children if research demonstrates that they reflect processes that emerge at different stages of a child’s cognitive development. For example, it has been suggested that the type of cognitive processing required to generate the causal attributions envisioned in Abramson’s model may not emerge until late childhood when the ability to engage in abstract reasoning and formal operational thought emerge (Abela

& Sarin, 2002). However, it is possible that a younger, less cognitively-mature child might develop a generalized negative outlook about the self, the world, or the future (as envisioned in Beck's model) by imitating her parents (Dearing & Gotlib, 2009), for example, or by experiencing chronic aversive life circumstances that result in repeated bad outcomes (Garber, 1992).

The Role of Cognitive Development

Over the course of cognitive development, children undergo dramatic changes in self-conceptualization. Although adolescents can understand psychological aspects of the self and describe themselves in abstract terms the way an adult would, younger children hold more concrete views of the self.

In early to middle childhood, a stage of cognitive development that occurs roughly between the ages of 4 and 7, children begin to realize that others are actively engaging in evaluations of the self. During this developmental stage, a child's self-concept is influenced by social relationships and an emerging awareness of the viewpoints and expectations of others (Harter, 1999). She learns that others are critically evaluating her attributes, but she lacks the self-awareness necessary to internalize other's evaluations, much less form independent evaluations of her own attributes.

Some theorists have hypothesized that children are inherently optimistic in early to middle childhood, and thus, incapable of experiencing hopelessness as it is envisioned in Abramson's hopelessness model of depression. However, a more likely explanation is that a self-focused perspective at this stage of cognitive development precludes a child from engaging in social comparison. Instead, she tends to make temporal comparisons between her current performance and her past performance when she was younger. The rapid skill development during these early years (e.g. being able to climb higher, run

faster, or reach further than she could when she was younger and physically smaller) is gratifying and contributes to highly positive self-evaluations (Harter, 1999).

It is interesting to note that growth and physical development could contribute to a sense of positive self-regard that appears to be normative in early to middle childhood. Many aspects of growth and physical development are by-and-large inevitable, on-going, and outside of a child's or parent's control. Yet, growth in and of itself can be seen as an achievement.

Approximately between the ages of 4 and 7, Piaget observed that child's cognitive development is typified by the ability to solve concrete problems. In other words, children in this stage are logical, social, communicative, and less egocentric than at earlier stages of cognitive development. However, in middle to late childhood, a developmental stage which occurs approximately between the ages of 8 and 12, children develop the ability to form more complex judgments about global self-worth. An emerging cognitive ability to form higher-order concepts enables a child at this stage to construct global evaluations of the self as a person. The acquisition of this skill is relevant to understanding the applicability of cognitive theories of depression to youth.

Additionally, with neurobiological development and repeated experiential learning, cognitive structures become more differentiated. An examination of these normative changes and an understanding that negative self-referent thinking and overinclusiveness of the personal category are central to the cognitive model of depression (Clark, 1999) have led researchers to question if the structure of depressive cognitions might also change over the course of cognitive development (LaGrange et al., 2008).

Developmental skills of logical and hypothetical reasoning about the past and the future, the ability to engage in systematic reasoning, and the ability to separate facts from

beliefs change and mature as a child grows up. These changes need to be taken into account when evaluating cognitive models of depression. For example, construction of a negative cognitive triad assumes that a child possess certain prerequisite cognitive skills that she may not yet have developed. Additionally, the schema-driven processing at the center of Beck's cognitive model could require the ability to retrieve past experiences from memory, compare them with current experiences, and spontaneously abstract common themes. (Abela & Sarin, 2002; Digdon & Gotlib, 1985).

RESEARCH ON BECK'S THEORY WITH CHILDREN

Few studies of Beck's theory have been conducted with child populations. In fact, only two major studies have used prospective designs in order to identify the presence of depressogenic schemata prior to the occurrence of a negative life event and prior to the onset of depression (Lakdawalla et al., 2007). In the first study, Lewinsohn and colleagues (2001) looked for the development of depressive symptoms over the course of a one-year period in a community sample of adolescents. Their results provided general support for Beck's theory as a trend, but the effect size for the diathesis-stress interaction was negligible.

In the second study, Abela and Sullivan (Abela & Sarin, 2002; Abela & Sullivan, 2003) added the contextual variables of social support and self-esteem to Beck's primary variables of depressive symptoms, negative life events, and dysfunctional attitudes. They also used a community sample, but it was limited to an analysis of seventh graders' data collected over a period of six weeks. Abela and Sullivan (2003) found support for the interaction of stressful life events and dysfunctional attitudes in predicting levels of depressive symptoms (i.e. Beck's diathesis-stress hypothesis) with a moderate effect size, but only in children with high levels of self-esteem and high levels of social support. The

authors suggest that perhaps the children with low levels of self-esteem and low levels of social support may have already held such negative views of themselves and their relationships that there was little room on the Children's Depression Inventory for detecting changes in levels of depressive symptoms over the course of the study (Abela & Sullivan, 2003; Lakdawalla et al., 2007).

One similar finding between both prospective studies of Beck's theory (Abela & Sullivan, 2003; Lewinsohn et al., 2001) was that the main effect of negative life events for predicting depressive symptoms was greater than either the main effect of dysfunctional attitudes or the interaction effect of negative life events and dysfunctional attitudes in predicting depressive symptoms. These findings support Shirk's theory (1988) that in children and adolescents, immediate reactions to current negative life events may be the sole cause of depressive symptoms. That is to say that cognitive patterns, such as Beck's dysfunctional attitudes, may not solidify into stable traits (and act as predictable diatheses for depression) until an individual has acquired a large enough database of life experiences and/or has achieved a certain level of cognitive development. The findings of these two prospective studies lead Lakdawalla and colleagues (2007) to conclude that more research is needed on the most basic tenets of Beck's theory with child populations before any conclusions can be reached about the strength of Beck's hypothesized etiologic chain in childhood depression.

Although only two major prospective studies of Beck's theory have been conducted with youth, a number of cross-sectional studies have examined specific aspects of Beck's theory with child and adolescent populations. Some specific findings from these cross-sectional studies include the following: a significant association between frequency of negative automatic thoughts and age, with adolescents up to age 17 having more negative automatic thoughts than children age 7 and up (Schmidt, Stark, Carlson, &

Anthony, 1998); mixed support for Beck's Content Specificity hypothesis that each psychological disorder will have a distinct profile (i.e. themes of loss and deprivation in depressive disorders, themes of danger in anxiety disorders, etc...) evident in the cognitions and the processing biases associated with the disorder (Laurent & Stark, 1993); greater levels of depressive symptoms associated with negative automatic thoughts and dysfunctional attitudes in adolescents; negative cognitive errors and negative life events associated with self-reported depressive symptoms in fourth, sixth, and eighth graders, but only weak support for a moderational diathesis-stress model with cognitive errors as the diathesis (Cole & Turner, 1993); and an association between the negative cognitive triad and severity of depressive symptoms in children in grades 4 to 7, but only partial support for a relationship with mothers' cognitive triads (Stark, Schmidt, & Joiner, 1996). More recently, in support of Beck's Content Specificity hypothesis, a study found that maladaptive schemas with themes of loss mediated the relationship between adolescents' retrospective reports of childhood emotional and physical abuse and current anhedonic depressive symptoms; whereas, maladaptive schemas with themes of danger mediated the relationship between childhood emotional and physical abuse and anxious symptoms (Lumley & Harkness, 2007).

The correlational nature of the cross-sectional studies of Beck's theory has left them open to criticism because they do not allow for the examination of temporal causal connections among negative life events, cognitive diatheses, and depression. However, Garber and Hollon (1991) argue that cross-sectional studies are a necessary part of psychopathology research for identifying potential causal variables that can later be analyzed with prospective designs. Additionally, Ingram and colleagues (1998) note that cross-sectional studies are essential for descriptive psychopathology because they help identify cognitive variables that are specific to depressive disorders. In fact, Beck labels

nine of his hypotheses as descriptive and suggests that some cognitive constructs, such as the negative cognitive triad, might simply be an intrinsic part of depression, rather than a cause or a consequence of depression (Clark, 1999) and therefore may be most appropriately studied with cross-sectional designs.

RESEARCH ON ABRAMSON'S THEORY WITH CHILDREN

A recent review (Lakdawalla et al., 2007) identified 17 studies of Abramson's hopelessness theory of depression with child and adolescent populations, making it one of the most studied cognitive theories of depression with younger populations. Half of the studies were conducted with children in the 8 to 12 year age range. (Abela, 2001; Abela & Payne, 2003; Abela & Sarin, 2002; Conley, Haines, Hilt, & Metalsky, 2001; Dixon & Ahrens, 1992; Nolen-Hoeksema, Girgus, & Seligman, 1992; Panak & Garber, 1992; Robinson, Garber, & Hilsman, 1995). The other studies were conducted with adolescents in the 13 to 19 year age range (Abela & Seligman, 2000; Hankin, Abramson, & Siler, 2001; Lewinsohn et al., 2001; Prinstein & Aikins, 2004; Southall & Roberts, 2002; Spence, Sheffield, & Donovan, 2002). The magnitude of effect size across all 17 studies examining hopelessness theory in 8 to 19 year olds was small on average.

Interestingly, when child studies were examined separately from adolescent studies, the effect sizes were found to be larger for the adolescent samples than for the child samples (Lakdawalla et al., 2007). For example, the diathesis-stress interaction of hopelessness theory (i.e. the interaction of negative life events with a depressogenic inferential style for predicting depressive symptoms) had a small average effect size across the child studies ($pr = 0.15$), but a larger average effect size ($pr = 0.22$) across the studies with 13 to 19 year olds (Lakdawalla et al., 2007).

However, age was not the only factor that could be used to differentiate the studies with small effect sizes from those with larger effect sizes. Across all 17 studies (of 8 to 19 year olds), larger average effect sizes were found in studies that used clinical interviews rather than self-report questionnaires of depressive symptoms (Dixon & Ahrens, 1992), used clinical diagnoses of depression as the outcome variable (Hammen, Adrian, & Hiroto, 1988), and used clinical samples of psychiatric inpatients. Additionally, Lakdawalla and colleagues (2007) note that although some of the studies that used the subtype of hopelessness depression as the predictor variable had relatively larger effect sizes (Abela & Sarin, 2002; Hankin et al., 2001), some did not. (Abela & Payne, 2003). Finally, of note for this dissertation, one of the studies with a larger average effect size (Abela & Sarin, 2002) used the weakest link approach to examine the three depressogenic inferential styles (i.e. causes, consequences, and self-characteristics) separately rather than in aggregate (Lakdawalla et al., 2007).

In summary, Lakdawalla and colleagues review (2007) finds support for Abramson's hopelessness theory of depression in children and adolescents across multiple studies. However, the interaction of depressogenic cognitive style and stressful life events appears to be a better predictor of depressive symptoms in adolescent populations than in younger child populations. Thus, the authors stress the need for finding alternative methods of understanding and assessing differences in the way Abramson's negative cognitive styles function across the lifespan. Specifically, the call out Abela and Sarin's weakest link approach (Abela & Sarin, 2002) as a promising avenue for future research because it allows for the possibility that the three facets of Abramson's negative cognitive style (i.e. causal attributional inferences, negative self-inferences, and negative inferences about the consequences of events) may be separable and may emerge at different points during a child's cognitive development.

LIMITATIONS OF PRIOR RESEARCH

Prior studies on developmental changes in depressive cognitions have been limited by the low rates of clinically depressed children in their samples (LaGrange et al., 2008). In fact, in one study, only five children manifested a depressive episode over the course of the entire study (Cole, Jacquez, et al., 2011). Not only are these numbers too small for statistical analyses, but also one cannot assume that the results of these studies will generalize to more severely depressed children (LaGrange et al., 2011). Therefore, additional research on changes in the relationship between depressive symptoms and maladaptive cognitions over the course of cognitive development is needed using a larger sample of children with clinical diagnoses of depression (LaGrange et al., 2008).

Prior studies have also been limited by their reliance on self-report measures of depressive symptoms (D'Alessandro & Burton, 2006). Although these measures have been used successfully to identify children experiencing depressive symptoms, they can be limited by the extent to which a child is capable and willing to report her depressive symptoms. Supplementing self-report measures with clinical interviews can provide a more complete picture of the symptoms a child is experiencing.

An additional limitation is that tests of cognitive models of depression with children have pooled together children of different ages and at different levels of cognitive development as a homogeneous group (LaGrange et al., 2008). This pooling of data fails to take into account differences in cognitive development between children and adolescents and does not allow for the fact that the structure of depressive cognitions may change as a child develops cognitively. As a result, in any single study, the level of cognitive development of the children included in the sample will determine whether or not support is found for the cognitive model of depression being studied.

Finally, a recent review of the overall empirical status of vulnerability-stress models of depression in children has found the research in this area to be lacking (Lakdawalla et al., 2007). Specifically, questions need to be answered about the age at which cognitive vulnerabilities to depression are detectable and operate as causal risk factors for the development of depressive disorders. Additionally, more research is needed to understand how cognitive vulnerabilities to depression may function in children and to disentangle the subtle differences delineated by different cognitive models of depression when applied to child populations.

THE WEAKEST LINK APPROACH

Initially designed to be used as a developmentally sensitive way of testing the hopelessness theory of depression (Lakdawalla et al., 2007), the weakest link approach (Abela & Sarin, 2002) is a method for identifying children who show signs of developing a depressogenic inferential style in one domain (e.g. negative self-characteristics), but who may not yet have achieved a level of cognitive development necessary for engaging in the abstract reasoning that is central to another domain (e.g. negative attributional style) (Hankin & Abela, 2005). Using the analogy that a chain is only as strong as its weakest link. Abela and Sarin (2002) put forward the weakest link hypothesis that child will only be as vulnerable to hopelessness depression as her most depressogenic inferential style makes her.

Derived from the integration of developmental psychopathology and the hopelessness model of depression, the weakest link approach suggests that the three cognitive styles of hopelessness theory (i.e. causes, consequences, and self) emerge independently at different points during a child's cognitive development. (Lakdawalla et al., 2007). The weakest link hypothesis states that until the three separate cognitive styles

coalesce into a single, global cognitive style, a child's vulnerability to hopelessness depression is determined by her most depressogenic cognitive style (Gibb & Coles, 2005).

Although its rationale is theoretical, the weakest link approach is actually a methodological technique for analyzing data from a measure of attributional style in order to test the diathesis-stress hypothesis of hopelessness theory in children (Abela & Sarin, 2002). In practical terms, this means using only a child's score from a single subscale (whichever score of the three subscales is highest or most depressogenic) to operationalize the diathesis component of the diathesis-stress hypothesis. (The word "weak" presumably is used to indicate that the authors view a depressogenic style as a weakness. However, it should be noted that the weakest link approach calls for using a child's most depressogenic (i.e. strongest) inferential style to assess her vulnerability to hopelessness depression.) In contrast, the additive approach, which might be more appropriate to use with adults or adolescents, calls for combining an individual's scores from all three subscales (either using the sum or the mean of the three subscale scores) to operationalize the diathesis component of the diathesis-stress hypothesis (Abela & Sarin, 2002).

There are several advantages to using the weakest link approach. Researchers may discover that an individual's greatest vulnerability to depression (or highest score on a single subscale) may be more important than her average vulnerability (Morris, Ciesla, & Garber, 2008). That is to say that in developing youth, testing a specific vulnerability hypothesis may be more appropriate than a general vulnerability hypothesis for examining cognitive theories of depression. Additionally, the weakest link approach is a way to not only prevent a researcher from prematurely rejecting the entire hopelessness model of depression in children, but also an important tool for psychologists to identify and provide treatment to children at risk for hopelessness depression (Abela & Sarin,

2002). Finally, unlike the current developmental approach of conducting separate analyses by age or grade (LaGrange et al., 2008), the weakest link approach allows for differences in cognitive development at the individual level.

Research has shown that the three depressogenic inferential styles at the center of Abramson's hopelessness theory of depression (Abramson et al., 1989) are separable and may emerge at different stages of cognitive development in children (Gibb & Coles, 2005). However, these patterns of cognitive development may not be unique to hopelessness theory.

In fact, research on Beck's cognitive theory of depression (Beck, 1967)—another similarly structured vulnerability-stress theory (Lakdawalla et al., 2007)—has found that the three component parts of Beck's cognitive triad (i.e. negative views of the self, the world, and the future) may also be separable and emerge as vulnerability factors at different stages of cognitive development in children (D'Alessandro & Burton, 2006). For example, results of one study suggest that negative views of the future may be the sole product of negative schemas in second graders, while views of the self and the world remain developmentally protected domains until later in childhood (LaGrange et al., 2008). These similarities suggest that using the weakest link approach might enhance current understanding of Beck's theory in children.

Using the concept of a weakest link diathesis, Morris and colleagues (2008) sought to expand the weakest link approach beyond hopelessness theory using different, but related measures of cognitive diatheses. Specifically, the constructs they examined as potential diatheses included attributions, self-worth, and hopelessness. Although they did not examine Beck's negative cognitive triad as a possible diathesis, their findings suggest that the "weakest link" approach could be used with other measures of negative

cognitions that were not derived from hopelessness theory, such as the Cognitive Triad Inventory for Children. (Kaslow et al., 1992).

Statement of the Problem

Cognitive models of depression, such as Beck's cognitive model and Abramson's hopelessness model were originally developed to explain the onset and recurrence of depression in adults. Central to both models is the hypothesis that well-developed cognitive diatheses within the individual determine which individuals will experience depressive symptoms when faced with stressful life events.

Unlike genetic diatheses, individuals are not born with fully developed cognitive diatheses. (LaGrange et al., 2011). Nevertheless, cognitive models of depression have been applied to children and adolescents without fully taking into account either the significant differences in cognitive abilities between adults and children or the ongoing cognitive developments that change and build throughout childhood and into adolescence.

In Abramson's model, the cognitive diathesis is a depressogenic inferential style comprised of three parts: (1) the tendency to make global, stable attributions about the causes of negative life events, (2) the tendency to infer negative characteristics about the self in reaction to the experience of negative life events, and (3) the tendency to assume that negative life events will result in catastrophic consequences. In Beck's model, the cognitive diathesis is the negative cognitive triad comprised of (1) a negative view of the self, (2) a negative view of the world, and (3) a negative view of the future.

Recent research has found that the three component parts of each model's cognitive diathesis may be separable in childhood. Instead of having three component parts that are correlated and form a unified construct (as it tends to with adults), the

component parts appear to develop separately at different points during a child's cognitive development (Lakdawalla et al., 2007). In fact, in Beck's negative cognitive triad, the structure of depressive cognitions appears to change with cognitive development (D'Alessandro & Burton, 2006; LaGrange et al., 2008).

A new method has been developed, the weakest link approach (Abela & Sarin, 2002), which allows for examining the three component parts of Abramson's depressogenic inferential style separately in children. Theories of cognitive development, such as Piaget's cognitive stage theory and information processing theories, support the notion that some component parts would develop earlier than others in children. The weakest link approach calls for only using a child's most depressogenic or most negative cognitive style for testing Abramson's model. This method may help identify children at risk for developing depressive disorders. The weakest link approach may also be a more accurate way to test the applicability of cognitive models of depression in younger populations because it may remove noise in the data caused by the presence of two potentially developmentally-inappropriate components.

This weakest link approach has not yet been used to test Beck's cognitive triad in children. Given the new research showing the separability of the three components of Beck's triad (Lakdawalla et al., 2007) and that the structure of Beck's cognitive triad changes with cognitive development (LaGrange et al., 2008), the weakest link approach appears ideally suited for testing Beck's model in children. It may reveal important changes that need to be made to Beck's model to make it more applicable to child populations.

Another way researchers have identified that a child's level of cognitive development may impinge on cognitive models of depression is related to the relationships among stressful life events, cognitions and depressive symptoms that appear

to change as a child matures (Cole & Turner, 1993). Adult cognitive diathesis-stress models hypothesize that a fully-developed, stable cognitive trait (known as a diathesis) within the adult makes her vulnerable to developing depression. When activated by the experience of a stressful life event, the cognitive diathesis is hypothesized to interact with the experience of the stressful event and lead to the development of depressive symptoms. Thus, for adults and older adolescents, the cognitive diathesis acts as a moderator variable.

In children, however, this model has not been well supported. Instead, a cognitive mediational model is hypothesized to describe better the relationship between stressful life events and the development of depression. The rationale for this mediational hypothesis is that children's cognitive abilities are continually developing and changing and their cognitive traits do not become stable until they are older. Thus, it is hypothesized that the experience of a negative life event will cause and contribute to the development of a negative cognitive style or outlook, which in turn will lead to depression in childhood.

HYPOTHESES

Hypothesis 1

It is hypothesized that Beck's negative cognitive triad will mediate the relationship between negative life events and depressive symptoms when it is calculated using the traditional additive approach. See Figure 4 for a model of this hypothesis.

Rationale

Despite potential developmental differences in the timing of the emergence of the three facets of Beck's cognitive triad, (D'Alessandro & Burton, 2006), it is expected that

maladaptive cognitions (i.e. the negative cognitive triad) will mediate the relationship between negative life events and depressive symptoms, even when using the additive approach, which utilizes all three facets of the triad (i.e. negative view of self, negative view of world, and negative view of future) to operationalize maladaptive cognitions because of the age range of the children in this study's sample (grades 3 through 8). So far, research has found the greatest distinctions among the three facets of the negative cognitive triad in early middle childhood (i.e. around second grade). Although all three facets do not appear to crystalize into a fully adult-like negative cognitive triad until approximately the eighth grade, the evidence suggests that the three facets emerge and develop throughout middle childhood, which is the age range of the participants in this study's sample. Therefore, utilizing all three facets, as is called for in the additive approach, is not expected to introduce unnecessary noise in the data, as it would if one or more of the facets were developmentally inappropriate.

Additionally, Beck's negative cognitive triad represents a generalized negative outlook that can be applied uniformly across multiple situations. A negative outlook or viewpoint (Beck's diathesis) may not require as high a level of cognitive maturity as may be necessary for evaluating negative life events or attributing causes to those negative life events (as is the case in Abramson's model). A younger child could simply adopt a negative outlook about the self, the world, and the future by imitating and repeating parental messages. Therefore, age and level of cognitive development are not expected to have a significant impact on a child's ability to possess a negative outlook in all three domains (i.e. self, world, and future).

Finally, as noted earlier, research with children has shown more support for cognitive diatheses acting as mediators between negative life events and depressive symptoms than acting as moderators. Even though Beck's diathesis-stress model

envisions the diathesis (i.e. negative cognitive triad) as a moderator when applied to adults, the meditational model here is more appropriate due to the ages of the children in the sample.

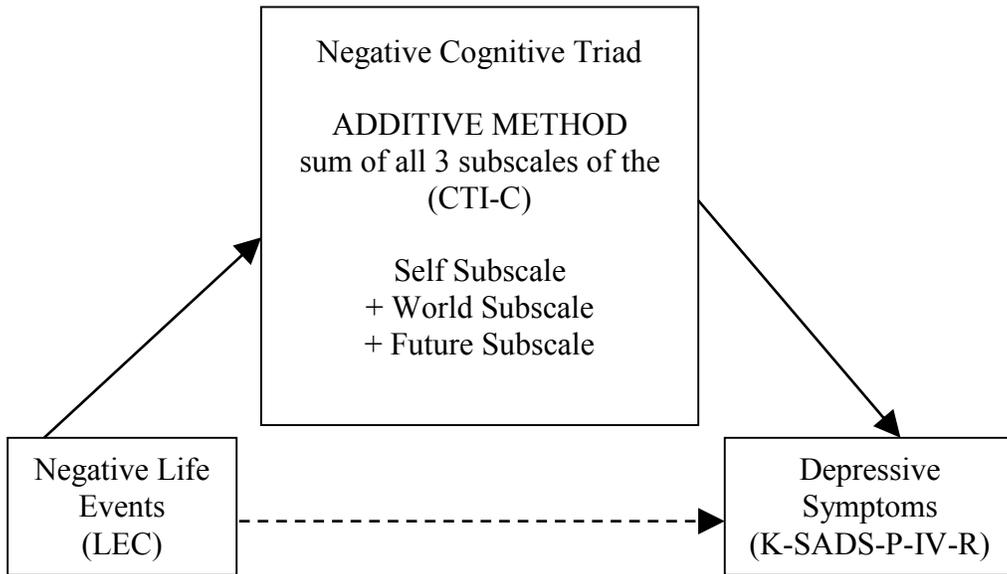


Figure 4. Beck's Model—Additive Approach (Hypothesis 1)

Hypothesis 2

It is hypothesized that Beck's maladaptive cognitions, or a negative outlook, will mediate the relationship between negative life events and depressive symptoms when calculated using the weakest link approach. See Figure 5 for a model of this hypothesis.

Rationale

Recent research has indicated that a negative view of the self, a negative view of the world, and a negative view of the future (i.e. Beck's cognitive triad) may be distinctly separate constructs in young children that emerge at different stages of cognitive development. Some research has found that a negative view of the future emerges at an earlier age than a negative view of the world or the self; however, other research has found that a negative view of the self emerges before the other two facets of Beck's triad. Even though there is not a consistent evidence base yet to suggest which facet of Beck's cognitive triad should emerge at which point in a child's cognitive development, the weakest link approach allows for testing Beck's model, knowing that the three facets develop separately, but not knowing the order in which they should develop.

Because the weakest link approach uses only a single facet of Beck's negative cognitive triad as a mediator in the vulnerability-stress model, it allows for the possibility that the three facets of the triad may be distinctly different constructs in children that emerge at different points in a child's cognitive development. Furthermore, because the weakest link approach allows for individual differences by using only each child's own weakest link in the analysis (i.e. for one child in the sample, the weakest link may be her score on the "view of the future" subscale of the Cognitive Triad Inventory for Children, but for another child in the sample, her weakest link may be her "view of the self" or "view of the future"), it is possible to test Beck's cognitive triad as a potential mediator in

the cognitive model of depression in a mixed sample of children, at differing levels of cognitive development.

As with Hypothesis 1, it is expected that Beck's maladaptive cognitions will mediate the relationship between negative life events and depression because it represents an attitude or an outlook and not judgments or evaluations that might require a higher level of cognitive development than the children in this sample. However, since the weakest link approach in this hypothesis (i.e. Hypothesis 2) uses only a child's most negative facet of Beck's triad (and not all three facets as in Hypothesis 1), it is likely that there will be even greater significance found for Hypothesis 2 than for Hypothesis 1.

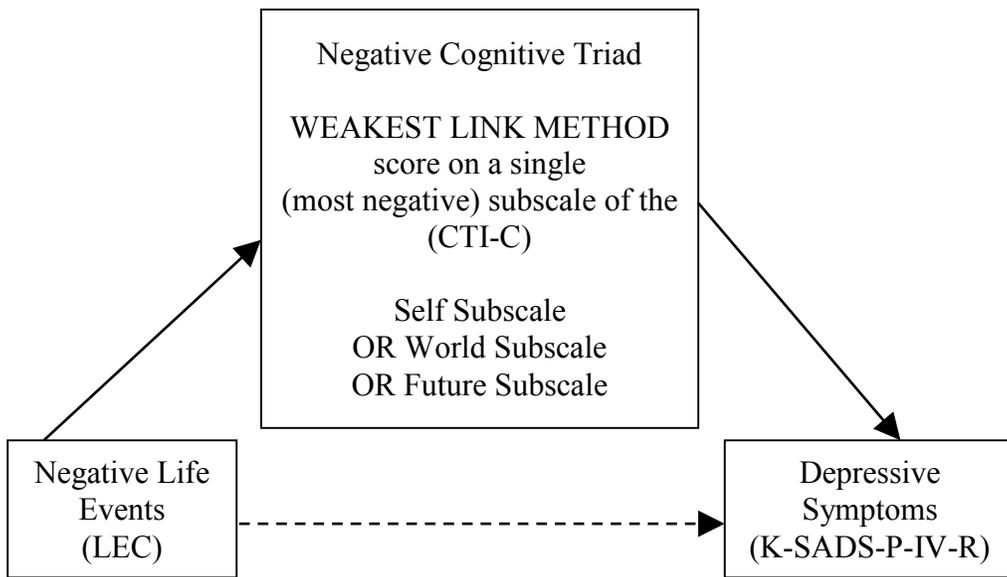


Figure 5. Beck's Model—Weakest Link Approach (Hypothesis 2)

Hypothesis 3

It is hypothesized that Abramson's depressogenic inferential styles will not be a significant mediator of the relationship between negative life events and depressive symptoms when it is calculated using the traditional additive approach. See Figure 6 for a model of this hypothesis.

Rationale

It is expected that depressogenic inferential styles will not be a significant mediator between negative life events and depressive symptoms when using the additive approach because the additive approach calls for using all three subscales of the Children's Cognitive Style Questionnaire: (1) negative inferences about self-characteristics, (2) negative inferences about the consequences of a negative life event, and (3) global, stable attributions about the causes of a negative life event. Using all three subscales may introduce noise in the data, since not all of the subscales may be developmentally appropriate for children, given their level of cognitive development. In particular, the ability to make causal/attributional inferences may require a level of abstract thinking and cognitive maturity that most children do not achieve until adolescence.

Although, the self-focus of a less cognitively-mature child may lead her to make depressogenic inferences about self-characteristics (which is measured on a different subscale) before developing the level of abstract reasoning necessary to make other types of depressogenic inferences, significance is not expected to be found in this hypothesis, because the inclusion of other, potentially developmentally-inappropriate subscales will add noise in the data, if not dilute the relationship. In other words, the additive approach, which combines three depressogenic inferential styles is not expected to lead to

significant findings because it includes three constructs that are distinctly different in children and may not all be developmentally-appropriate for all age groups.

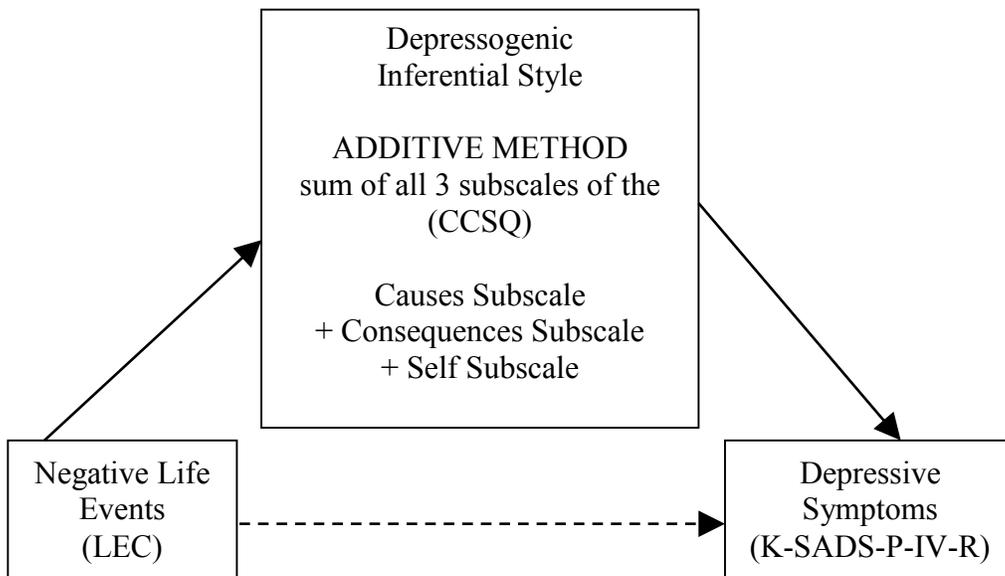


Figure 6. Abramson's Model—Additive Approach (Hypothesis 3)

Hypothesis 4

It is hypothesized that Abramson's depressogenic inferential style will be a significant mediator of the relationship between negative life events and depressive symptoms when it is calculated using the weakest link approach. See Figure 7 for a model of this hypothesis.

Rationale

Unlike Hypothesis 3, which uses all three depressogenic inferential styles, this hypothesis uses only the most depressogenic inferential style each child possesses (i.e. the weakest link approach). Although some depressogenic inferential styles are thought to require a level of cognitive sophistication and ability to engage in abstract thought that young children have not yet developed (e.g. the ability to make causal attributions), other depressogenic inferential styles (such as the ability to make negative inferences about self-characteristics given a negative life event) may be developmentally-appropriate and operational in younger children. Since the weakest link approach uses only a single type of depressogenic inferential style as a cognitive mediator (i.e. the most negative or depressogenic style), it is expected that this hypothesis will be significant and find support for Abramson's hopelessness model of depression in children.

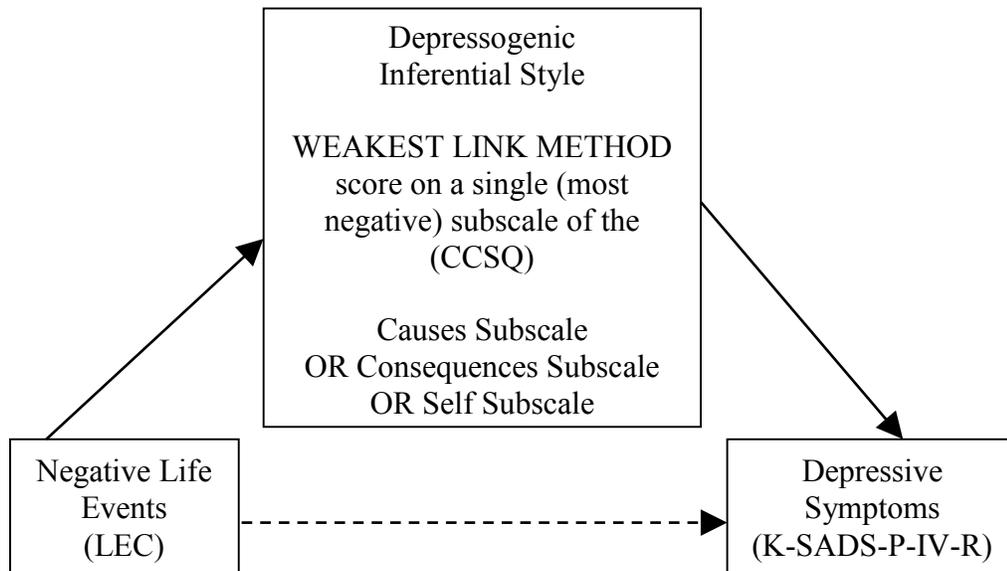


Figure 7. Abramson's Model—Weakest Link Approach (Hypothesis 4)

Hypothesis 5

It is hypothesized that there will be a categorical association between a child's grade level in school and the (name of the) subscale of the Cognitive Triad Inventory for Children that represents her weakest link.

Rationale

This hypothesis is exploratory. It is expected that a chi square test of independence will show an association between a child's category of weakest link on Beck's cognitive triad and her (category of) grade in school. (In keeping with other's analyses in this area, grade in school is a proxy for level of cognitive development.) Conflicting evidence makes it difficult to predict which category of Beck's triad will be associated with which grade level in school. However, the fact that there have been associations in prior research means that this is an area worthy of further exploration.

Much of the research on Beck's cognitive triad in children has been limited by the use of pooled data across diverse age ranges. Pooling data is problematic because it obscures the possibility that developmental changes in a child's cognitive abilities might also lead to developmental changes in a child's cognitive triad. Recent developmentally-sensitive analyses that used grade level in school as a proxy for cognitive development and examined each grade level separately have opened up new avenues for research that need to be explored further. Specifically, studies of the Cognitive Triad Inventory for Children have found that the structure of depressive cognitions appears to change with cognitive development and that the three facets of Beck's cognitive triad (i.e. negative views of self, world, and future) may emerge separately at different stages in a child's cognitive development. However, it is unclear whether or not these facets develop in any particular order.

A theoretical case could be made for why any one of the three aspects of Beck's triad might develop earlier in childhood than others; however, there is not enough evidence yet to support any one case. As a case in point, one study found that negative views of the future developed earliest, which led the authors to suggest that negative views of the future might be the only product of negative schemas in early middle childhood, while negative views of the self and negative views of the world remain developmentally protected domains. However, results of another study with a non-clinical sample led the authors to suggest that as concepts, negative views of the world and negative views of the future might be too abstract for young children and that at early ages only negative views of the self might be concrete enough to act as a catalyst for depressive symptoms.

Although Hypothesis 5 is descriptive, the identification of possible connections between category of weakest link of Beck's cognitive triad and level of development in children would serve as a helpful guide for which direction to pursue when conducting future research in this area.

Hypothesis 6

It is hypothesized that there will be a categorical association between a child's grade level in school and the (name of the) subscale of the Children's Cognitive Style Questionnaire that represents her weakest link

Rationale

This hypothesis is exploratory. It is expected that a chi square of independence will show an association between the category of weakest link" on the Children's Cognitive Style Questionnaire (i.e. tendency to make global, stable causal attributions,

tendency to infer catastrophic consequences, and tendency to infer negative self-characteristics in reaction to a negative life event) and the category of grade level in school, but not enough research has been conducted in this area to predict which category of “Weakest Link” of depressogenic inferential style will be associated with which grade level in school. (In keeping with others’ analyses in this area, grade level in school is a proxy for level of cognitive development.)

Although Hypothesis 6 is descriptive, the identification of possible connections between category of “Weakest Link” of Abramson’s depressogenic inferential styles and level of cognitive development in children would serve as a helpful guide for which direction to pursue when conducting future research in this area.

CHAPTER 3: METHOD

Participants

The participants in the sample for this study came from two preexisting studies. The first group (the “depressed group”) came from the pretreatment sample in a larger study on the efficacy of an in-school, cognitive behavioral therapy treatment for girls with depression. In order to qualify for the study, the girls had to be experiencing Major Depressive Disorder, Dysthymic Disorder, and/or Depressive Disorder Not Otherwise Specified at the time of the pretreatment assessment. The second group (the “not-depressed group”) was a normative sample of girls from the same schools as the girls in the “depressed group.” For the purposes of this study, the two samples (“depressed group” and “not-depressed group”) were combined into a single sample.

The reason for doing this was to be able to test cognitive theories of depression in a sample of girls whose depressive symptoms spanned a wide spectrum—from not depressed to highly depressed and many gradations in between. Since cognitive vulnerability-stress theories of depression not only make predictions about the circumstances under which an individual will be depressed, but also the circumstances when an individual with a cognitive vulnerability will not exhibit symptoms of depression, it was deemed necessary to expand the first sample to include participants who were not currently experiencing depressive disorders so the theories could be fully tested.

A uniform set of exclusionary criteria were applied to both the “depressed group” and the “not-depressed group” for the safety of participants and to ensure the collection of valid data. If a participant was actively suicidal ($n = 1$) or expressed homicidal ideation ($n = 0$), a detailed risk-assessment procedure was implemented, including an immediate

psychiatric evaluation and the child was excluded from further participation in the study. (Suicidal risk assessment procedures are further elaborated upon in the procedures section.) Additionally, children with an IQ below 85 ($n = 1$) or a learning disability that would interfere with valid measure completion ($n = 0$) were also excluded from the study.

The first group, the “depressed group,” included 149 girls, aged 9 to 14 from two suburban central Texas school districts. The sample was fairly evenly divided amongst grades 4 through 7, with slightly more elementary school students than middle school students.; there were 43 fourth graders (28.9%), 40 fifth graders (26.8%), 35 sixth graders (23.5%), and 31 seventh graders (20.8%). The “not-depressed group” included 49 girls aged 9 to 14 in grades 4 through 8. Of the girls in the “not-depressed group,” 3 were fourth graders (6.1%); 17 were fifth graders (34.7%); 10 were sixth graders (20.4%); 18 were seventh graders (36.6%) and 1 girl was in the eighth grade (2.0%). For the analyses in this study, data from the solitary eighth grader was combined with the data from the 7th graders, as if they were all in one grade.

Demographic information for the total sample (the combined “depressed group” and “not-depressed group”) is summarized in Table 1.

Table 1: Participant Demographic Variables for the Total Sample ($N=198$)

Variable	<i>n</i>	Percent
Grade		
4th	46	23.2
5th	57	28.8
6th	45	22.7
7th	49	24.7
8th	1	0.6
Age		
9	40	20.2
10	51	25.8
11	47	23.7
12	39	19.7
13	19	9.6
14	2	1.0
Race & Ethnicity		
African American	26	13.1
Asian American	6	3.0
Multi-Racial	16	8.1
White Hispanic	65	32.8
White Non-Hispanic	85	42.9

Measures

Information about screening measures used to identify some of the eligible participants for the “depressed group” in the larger treatment study is included below. Even though the screening measures were not analyzed in the current study, two of these measures, the Beck Depression Inventory for Youth (BDI-Y) and the Children’s Depression Inventory (CDI), were administered again at the same time as the measures that were used in the current study. Descriptions of these screening measures are included for completeness, because it is possible that filling out multiple measures of depression in one sitting could affect how a child responded to the questionnaires that were analyzed in this study.

SCREENING MEASURES

Beck Depression Inventory for Youth

The Beck Depression Inventory for Youth (BDI-Y; Beck, Beck, & Jolly, 2001) is a 20-item self-report measure of depressive symptoms on children ages 7 to 14. The BDI-Y assesses the presence and severity of affective, cognitive, and somatic symptoms of depression. The BDI-Y has demonstrated high internal consistency validity with a coefficient alpha of .91 for girls. It has good construct validity and discriminant validity in that its correlation with the Children’s Depression Inventory ($r=.72$) was higher than its correlation with self-report measures of anxiety, anger, and disruptive behavior; in a clinical sample, children with mood disorders scored higher on the BDI-Y than children with other disorders (Beck, et al., 2001). Over the course of one week, test-retest reliabilities have ranged from .79 to .92 (Beck, et al., 2001).

In a recent school-based study of girls age 9 to 13, the BDI-Y demonstrated high internal consistency reliability overall and across subgroups by age and by ethnicity with

Cronbach's alpha ranging from .91 to .94 and all but two confidence intervals completely above a .90 criterion (Stapleton, Sander, & Stark, 2007). Additionally, the BDI-Y demonstrated good convergent validity when correlated with the Children's Depression Inventory for the overall sample of girls age 9 to 13 ($r=.83$) and for individual age subgroups for 10, 11, 12, and 13 year olds with correlations ranging from .84 to .86, but the correlation was significantly lower for 9 year olds ($r=.73$) (Stapleton, et al., 2007).

Although the BDI-Y was not used directly in this study, it was used as part of a multiple-gate screening procedure to identify some of the participants in the larger cognitive behavioral therapy efficacy study. Additionally, all participants completed the BDI-Y as part of a packet of pretreatment measures. See Appendix F for a copy of this measure.

Children's Depression Inventory

The Children's Depression Inventory (CDI; Kovacs, 1981) is a 27 item, self-report measure of depression for use with children ages 7 to 17. The CDI assesses the presence and severity of depressive symptoms experienced over the prior two-week period. Using a three-choice format to determine severity of depressive symptoms, scores can range from 0 to 54, with higher scores indicating a greater level of depressive symptoms. Prior studies have reported estimates of internal consistency reliability ranging from .71 to .89 and test-retest reliability ranging from .38 to .87 over a two-week interval (Kovacs, 1981; Smucker, et al., 1986). In a recent school-basses sample of 859 girls, age 9 to 13, internal consistency reliability for the CDI was high (Cronbach's alpha = .90) (Stapleton, Sander, & Stark, 2007). See Appendix E for a copy of this measure.

Diagnostic and Statistical Manual Brief Symptom Interview for Depression

The Diagnostic and Statistical Manual Brief Symptom Interview for Depression (DSM; Stark, 2003) is a brief clinical interview based on the DSM-IT-TR criteria for depressive disorders. As part of the multiple-gate screening procedure (diagramed in Appendix K) in the larger cognitive behavioral therapy efficacy study, participants who scored above the cut-off score on a self-report measure of depression (either the BDI-Y or the CDI) were then screened with this brief interview. If the DSM interview revealed that the child was experiencing clinically significant symptoms of depression at the time of the interview or in the immediate prior two-week period, she was eligible to proceed on to the next gate in the screening procedure, an in-depth K-SADS diagnostic clinical interview. See Appendix H for a copy of this measure

MEASURE OF STRESSFUL LIFE EVENTS

The Life Events Checklist

The Life Events Checklist (LEC; Johnson & McCutcheon, 1980) is a self-report inventory of negative and positive life events. It contains a list of 38 events a child may have experienced, such as “parents divorced” or “changing to a new school.” The items in the checklist fall into categories of life experience, such as family health, family member changes, family moves, money, crises, unexpected news, parents’ marital relationship, parent-child relationship, and family resources.

For each event, the child is asked to indicate which of the events have happened to her in the last year. For each chosen life event, she is asked to circle whether her experience of the event was “good” or “bad.” Then she is asked to indicate how much of an effect each had on her life on a four-point scale (“no effect,” “some effect,” “medium effect,” or “big effect”).

Because this is an open-ended inventory, three spaces are left blank at the end of the questionnaire for the child to write in up to three other events she experienced and then to rate each one as “good” or “bad” and indicate how much of an effect each had on her life. It is likely the child will leave many of the items blank because she has not experienced them within the last 12 months.

For the purposes of this study, total quantity of events experienced was not used. Rather the checklist was used to identify whether the child experienced any stressful life events (i.e. one or more events selected, classified as “bad,” and perceived by the child as having had an effect on her life). Then the sum of the child’s ratings of “perceived effects on herself” for all of the events she rated as “bad” was used as a measure of negative life events.

The LEC has demonstrated acceptable levels of reliability and validity (Johnson & McCutcheon, 1980). The LEC has been shown to be a reliable estimate of overall stress (Duggal et al., 2000), which can be used in large samples (Romero, Birmaher, Axelson, et al., 2009). Good test-retest reliability has been demonstrated for negative life event scores (.72) and positive life event scores (.69) (Brand & Johnson, 1980). Additionally, adequate internal consistency reliability ($r=.70$) has been demonstrated (Overstreet, et al., 1999). See Appendix J for a copy of this measure.

MEASURES OF COGNITION

The Cognitive Triad Inventory for Children

The Cognitive Triad Inventory for Children (CTI-C; Kaslow, Stark, Printz, Livingston, & Tsai, 1992) is a 36-item self-report measure of negative views of the self, the world, and the future. It is a downward extension of the adult version of the Cognitive Triad Inventory (CTI; Beckham, Leber, Watkins, Boyer, & Cook, 1986). The CTI-C was

designed to be used with children ages 9 to 14; however, it has been used with children as young as 7.

The CTI-C contains a list of 36 statements. For each statement, the child is asked to indicate whether or not the statement describes what they are thinking right now or what they are feeling today by circling “yes,” “maybe,” or “no.” The measure contains 18 positively worded items, such as “I think I will be happy as I get older” and 18 negatively worded items, such as “there is nothing in my life left to look forward to.” The items are scored on a scale of 0 to 2. Total scores range from 0 to 72, with lower scores indicating a more negative cognitive triad.

The CTI-C assesses three schemas, representing a child’s view of herself, the world, and her future. Thus the items can be divided into three separate subscales consisting of 12 items each, one for each component of Beck’s negative cognitive triad. The scores on each subscale range from 0 to 24, with lower scores indicating a more negative view of self, world, or future.

The CTI-C has shown solid convergent and discriminant validity, high internal consistency validity on the full scale ($\alpha = .92$) and moderate internal consistency on the individual subscales with alphas of .83, .69, and .85 for views of self, world, and future, respectively (Kaslow, et al., 1992). A developmentally-sensitive analysis, which examined the CTI-C separately for each grade level from second through eighth grade, found full-scale alphas ranging from .86 to .94. In a sample of African American and Caucasian American teenagers, the CTI-C was shown to have high internal consistency reliability (Cronbach’s $\alpha = .90$), moderate test-retest reliability over a four-month interval ($r = .70$) and moderate concurrent validity when correlated with the Children’s Attributional Style Questionnaire-Revised ($r = .53$) (Greening, Stoppelbein, Dhossche, & Martin, 2005). See Appendix I for a copy of this measure.

The Children's Cognitive Style Questionnaire

The Children's Cognitive Style Questionnaire (CCSQ; Mezulis, Hyde, & Abramson, 2006) is a self-report measure of cognitive inferential style based on the hopelessness theory of depression. The CCSQ is loosely based on a combination of two measures of inferential style used with adults: the Cognitive Style Questionnaire (Abramson, et al., 2000) and the Inferential Style Questionnaire (Rose, et al., 1994).

The CCSQ contains six hypothetical scenarios, four of which are about negative life events and two are about positive life events. The two scenarios about positive events are not used in scoring the measure; their purpose is to keep children from tiring from imagining so many negative events in their lives as they respond to the four negative scenarios. Of the four scenarios used to score the questionnaire, two are about achievement events at school and two are about interpersonal events. Under each scenario, the child is asked to imagine why the situation would have happened to her (even if she had actually never experienced it before).

Under each scenario, there is a series of five hypothetical statements, each designed to measure a different facet of the depressogenic inferential style: (1) the tendency to make negative inferences about the consequences of a life event, (2) the tendency to make negative inferences about self-characteristics when experiencing a life event, and three statements about the tendency to make causal attributional inferences about life events that are (3) global or specific, (4) stable or unstable, and (5) internal or external.

The child rates each hypothetical statement on a scale of 1 ("I don't agree at all") to 5 (agree a lot"). The four "consequences" statements (one under each negative scenario) can be summed to form a "consequences" subscale with scores ranging from 4 to 20. Similarly, the four statements about self-characteristics (one under each negative

scenario) can be summed to form a “self” subscale and the twelve “causal attributional” statements (three under each scenario) can be summed to form an “attributional style” subscale ranging from 12 to 60 with higher scores indicating a more negative attributional style.

In two different samples, internal consistency (coefficient alpha) ranged from .84 to .88 for the total scale and from .76 to .85 for the subscales. Test-retest reliability over a 1-week period was .77 for the total scale, .50 for the consequences subscale, .48 for the self subscale, and .83 for the attributional style subscale (Mezulis, et al., 2006). See Appendix G for a copy of this measure.

MEASURE OF DEPRESSION

Schedule for Affective Disorders and Schizophrenia for School Age Children

The Schedule for Affective Disorders and Schizophrenia for School Age Children (K-SADS-IVR; Ambrosini & Dixon, 2000) is a semi-structured diagnostic interview designed to be administered to children ages 6 to 18 and their parent. Parent and child are interviewed separately about the child. Each interview lasts about 90 minutes. At the end of the interview, the interviewer takes into account the present episode summary scores from the parent report, the child report, and the clinician’s informed decision to diagnose the child with one or more Axis I disorders from the DSM-IV. In addition, each diagnosis is given a “severity of illness” rating, ranging from 1 (normal, not at all impaired) to 7 (among the most extremely impaired subjects).

The K-SADS IIR (Puig-Antich & Ryan, 1986) was updated (to the K-SADS-IVR) in order to meet current diagnostic criteria for the DSM-IV. As such very little psychometric data are available on the newest version. However, the K-SADS IIR has

demonstrated test-retest reliability of .67 and internal consistency reliability (coefficient alpha) of .86 (Chambers et al., 1985; Last & Strauss, 1990).

Although the K-SADS can provide diagnose of multiple Axis I disorders (e.g. major depressive disorder, dysthymic disorder, eating disorder, conduct disorder, etc...), for the purposes of this study, only the items designed to assess symptoms of depression (major depressive disorder or dysthymia) will be used in detail. Specifically, the following symptoms of depressive disorders assessed on the K-SADS will be combined to create a continuous total depression score:

1. Depressed mood
2. Irritability
3. Excessive guilt
4. Anhedonia (loss of interest)
5. Anhedonia (loss of pleasure)
6. Fatigue/lack of energy
7. Difficulty concentrating/slowed thinking
8. Psychomotor agitation (unable to sit still, pacing, hand wring, shouting and complaining, cannot stop talking)
9. Psychomotor retardation (slowed speech, increased pauses, low speech, decreased amount of speech, slowed movements, depressive stupor)
10. Insomnia
11. Hypersomnia
12. Increased appetite, weight gain
13. Loss of appetite; anorexia, weight loss
14. Hopelessness/helplessness
15. Low self-esteem

16. Suicidal ideation; suicidal acts; self-damaging (non-suicidal) acts

Each symptom of depression receives a rating on a scale of 0-4 or 0-6, with higher scores indicating greater severity. A continuous total depression score will be created by summing the 16 depression-related items listed above; this score will be the dependent variable in the current study. A similar continuous depression score on an older version of the K-SADS has been found to correlate with scores on the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) in a sample of adolescent girls.

Recently, aggregate data from multiple studies that used different versions of the K-SADS (versions dating from 1994 to 2001) have been used to assess the relationship between symptoms of depression and the underlying dimension of depression. Specifically, a confirmatory factor analysis (Cole, Cai, et al., 2011) of K-SADS depression data from 12 studies (n=3403) found evidence of a very strong single latent factor with loadings for ten symptoms of depression ranging from 0.95 for depressed mood to 0.73 for suicide. This factor accounted for 75.4% of the covariance among the ten symptoms of depressed mood, appetite disturbance, sleep disturbance, suicide, psychomotor agitation or retardation, irritability, anergia, guilt or low self-esteem, concentration difficulties, an anhedonia. Furthermore, no secondary factors or nuisance factors emerged from the analysis (Cole, Cai, et al., 2011).

Procedure

ETHICAL CONSIDERATIONS

This study complies with both the ethical standards for research at the University of Texas at Austin and the Ethics Code of the American Psychological Association. Because the data were collected as part of a larger treatment study which took place in schools, during the school day, the Principal Investigator received additional approvals

from multiple representatives of the schools prior to the start of the study. Specifically, the superintendents of the school districts approved a written proposal which described the study. Then, the principals of the schools granted permission after meeting with the Principal Investigator to learn about the study. Finally, the Principal Investigator met with teachers at the schools to explain the study and answer any questions they had. Since screening and interviewing participants was a multi-step process, it was necessary to obtain the assent of the child participants and the consent of their primary caregivers several times. Therefore, the specific procedures and forms used are described below in the corresponding sections on participant recruitment and data collection.

Safety of Participants

Once of the most serious symptoms of a major depressive episode is recurrent thoughts of death and/or suicidal ideation; although, not all individuals with depression experience suicidal ideation. Since the larger treatment study screened participants for depressive symptoms and specifically sought to identify participants with depression, it was necessary to have safety procedures in place for assessing and responding to suicidal risk. Two of the self-report measures of depressive symptoms each contained a question that queried about suicidal ideation (item # 9 on the Children’s Depression Inventory and item #4 on the Beck Depression Inventory for Youth). If a participant endorsed either one of those items (or expressed thoughts of suicide at other times in the study), she met immediately with a graduate research assistant trained in the assessment of suicidal risk who determined the severity of the risk and discussed the case with the Principal Investigator.

If a participant expressed thoughts of suicide but was not determined to be at risk, she completed a “no harm” contract with the school counselor, her primary caregiver was

contacted to discuss safety concerns and provide emergency contact phone numbers, and a close monitoring plan was established to ensure the safety of the participants. If the participant was actively suicidal, her caregiver was asked to come to the school immediately and was given a referral to a consulting psychiatrist who completed an emergency psychiatric evaluation. Of the nearly 8,000 girls screened during the study, 48 girls (1.4%) completed “no harm” contracts and were monitored on a daily basis and 1 girl who expressed serious suicidal intent was referred for immediate psychiatric evaluation and did not participate any further in the study.

DATA COLLECTION

Participants were recruited in elementary and middle schools. Graduate research assistants met in classrooms with girls in grades 4 to 7 to distribute primary caregiver consent forms, child assent forms, and a letter describing the study. Completed permission forms were collected by the school counselors. Once signed primary caregiver consent forms and child assent forms were received, girls were eligible to participate in the study.

“Depressed Group”

For the “depressed group,” a multiple gate screening procedure was used to identify girls with depressive symptoms and ultimately a diagnosis of depression. A flowchart of the screening procedures, including the number of participants screened out as each gate, can be seen in Appendix L. Questionnaires were administered in school, during the school day.

School district 1 used the BDI-Y and the CDI to screen. Those with elevated scores (25 or higher on the BDI-Y and/or 16 or higher on the CDI) were administered a brief interview based on the DSM-IV criteria for depressive disorders. Those who

indicated they had experienced depressive symptoms were then referred for a K-SADS interview. Those who received a primary diagnosis of Major Depressive Disorder (MDD), Dysthymic Disorder (DD), or Depressive Disorder Not Otherwise Specified (DDNOS) were then invited to participate in the study. Those who chose to participate completed a battery of measures at pre-treatment, including the CDI, the CCSQ, the CTI-C, the LEC, and the BDI-Y.

School district 2 used the CDI and the CCSQ to screen participants. Participants with elevated scores on the CDI (a score of 16 or higher) were administered a brief interview based on the DSM criteria for depression. The interview lasted 15 to 20 minutes. Those who indicated they had depressive symptoms were then referred for a K-SADS interview. Those who received a diagnosis of MDD, DD, and DDNOS were invited to participate in the study. Those who chose to participate completed a battery of pre-treatment self-report measures, including the CDI, the CCSQ, the CTI-C, the LEC, and the BDI-Y.

“Not-depressed group”

A random selection of classrooms used to recruit participants for the larger treatment study was used to identify volunteers for inclusion in the “not-depressed group.” Graduate research assistants recruited girls to participate by describing the study to middle school girls in their math classrooms and elementary school girls in their homerooms. After completing assent and consent forms similar to those used in the treatment study, 49 girls and their caregivers agreed to complete a battery of measures, including the CDI, the CCSQ, the CTI-C, the LEC, and the BDI-Y. They also completed a diagnostic clinical interview (K-SADS) and received an honorarium of \$20.

Training of Measures Administrators and Interviewers

Measures administrators were graduate level students with at least one year of experience who had completed NIH human subjects training. K-SADS-P-IVR diagnostic interviewers were doctoral level graduate students with at least 50 hours of training in administering and scoring the K-SADS. The interviewers had to demonstrate reliability in symptom ratings and diagnostic accuracy before conducting interviews on their own. All K-SADS interviewers received on-going supervision throughout the study.

CHAPTER 4: STATISTICAL ANALYSES

This chapter contains descriptions of analytic procedures used, as well as detailed statistical results for each path tested in each model analyzed. Diagrams and tables of results are presented separately for each hypothesis tested. In the following chapter, a general overview of key results for each hypothesis are condensed together into the same table in order to facilitate comparisons between Beck's model and Abramson's model for children at varying levels of cognitive development.

Preliminary Analyses

MISSING DATA

To determine whether missing data were missing completely at random (MCAR), missing at random (MAR), or missing not at random (MNAR), a missing value analysis (MVA) was conducted in SPSS 21.0. A chi-square analysis for Little's MCAR was not statistically significant, meaning the data were likely missing completely at random. EM estimation procedures based on maximum likelihood estimation were conducted to impute missing values and create a new dataset with EM estimates for all the missing values.

ASSUMPTIONS OF REGRESSION

Preliminary screening of the main variables in this study was conducted visually, through the use of scatterplots; no extreme outliers were evident in the visual inspection of the data. Next, separate linear regression analyses were conducted for the *a* path, the *b* path, the *c* path, and the *c'* path used in each meditational model. Standardized residuals were then saved from those analyses and analyzed to check for violations of the assumptions of multiple regression. Normal P-P plots (expected cumulative probability

by observed cumulative probability) of the standardized residuals were created, as well as scatterplots of standardized residuals by adjusted predicted values, and histograms of the standardized residuals to see if the data were normally distributed.

For the K-SADS continuous depression scores, the Kolmogorov-Smirnov and Shapiro-Wilks tests, along with plots of standardized residuals from the regression analyses, indicated that estimates of skewness and kurtosis were adequate. The only clear violation of the assumptions for regression, was the assumption of normality of the residuals for the CCSQ. For the CCSQ total scale, skewness and kurtosis statistics were both greater than twice the standard error, indicating there were violations of the assumption of normality.

A histogram for the CCSQ total score variable, which can be seen in Figure 8 also indicated a severe right-skew of the data. Neither a square-root transformation, nor a logarithmic transformation could adequately correct for the non-normal distribution. Ultimately, an inverse transformation was used with the CCSQ total scale scores. The results of the transformation were adequate, as can be seen in Figure 9.

Interestingly, the CCSQ weakest link scale, which is comprised of a single subscale score from the CCSQ (either the causes/attributional style subscale score or the “consequences” subscale or the “self-inferences” subscale) for each participant, did not have the severe right-skew that the CCSQ total score did. This can be seen in Figure 10.

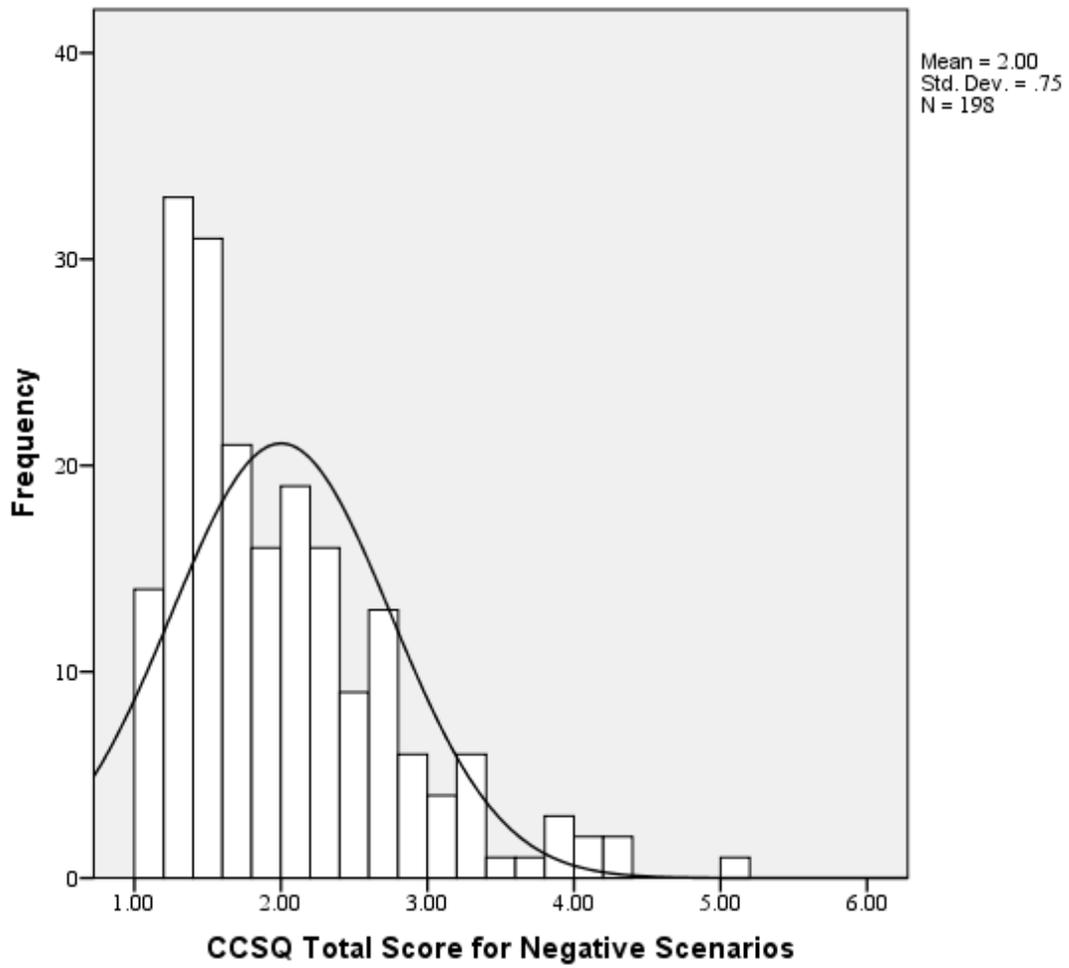


Figure 8. Histogram of CCSQ Total Scores Before Transformation

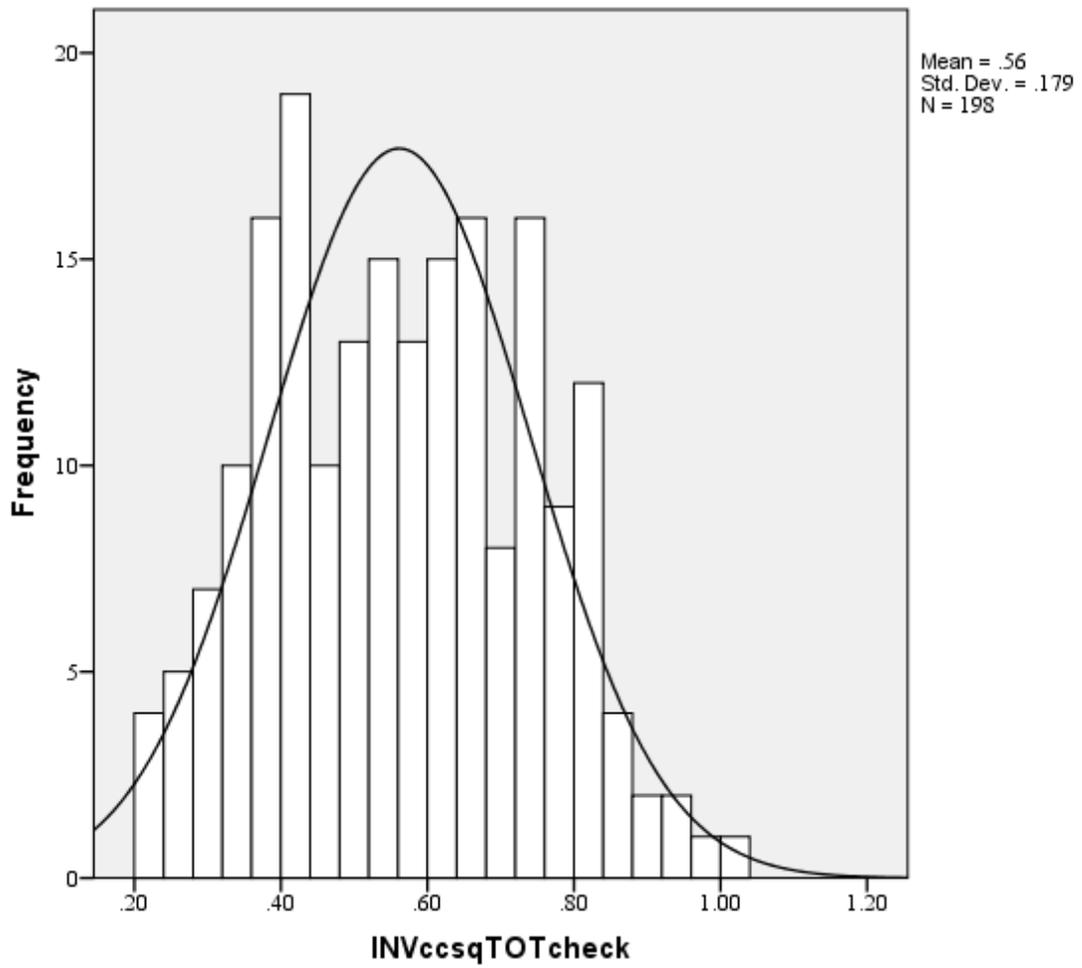


Figure 9. Histogram of CCSQ Total Scores after an Inverse Transformation

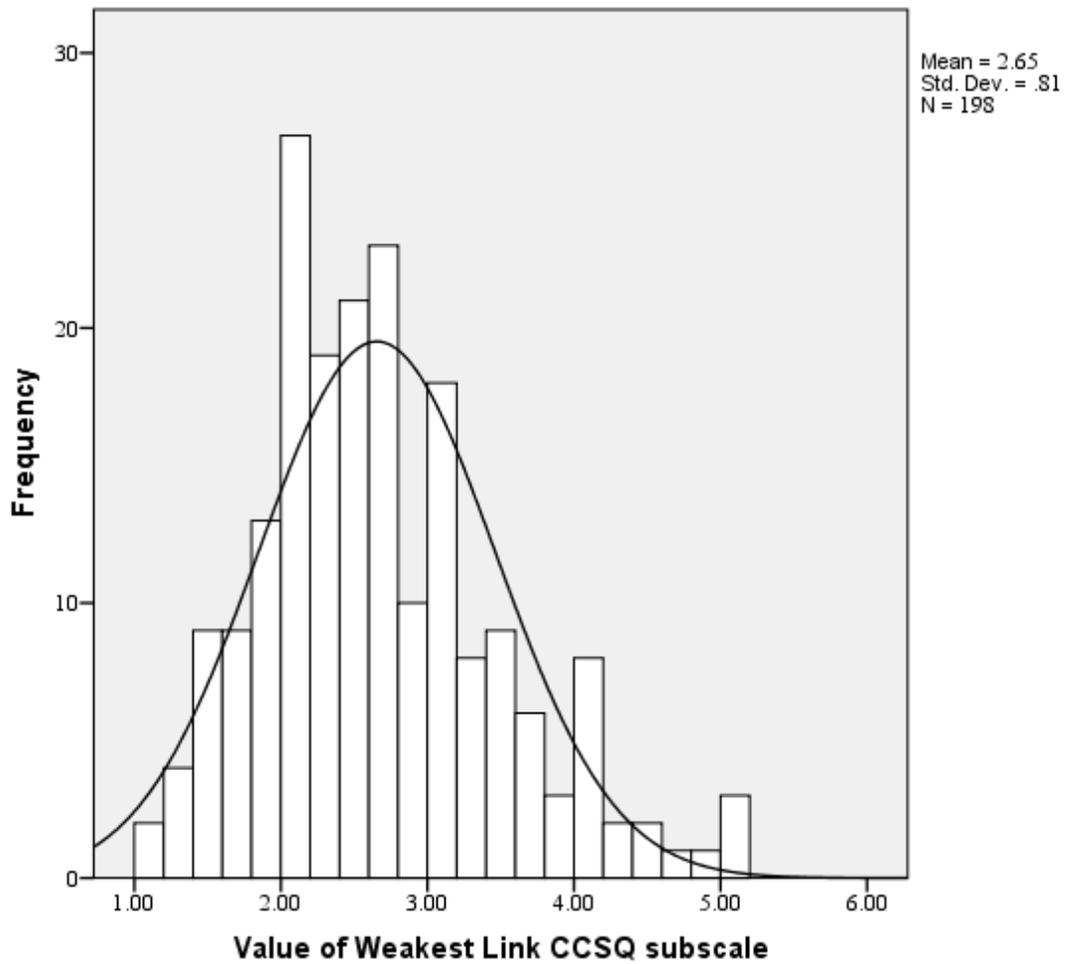


Figure 10. Histogram of CCSQ Weakest Link Scores

DESCRIPTIVE STATISTICS

Table 2 contains descriptive statistics for the entire sample, including means, standard deviations, and Cronbach’s alphas for the main variables in this study. Correlations among study variables can be seen in Table 3. Finally, descriptive statistics broken down by grade in school are in Table 4 and 5.

Table 2. Means, Standard Deviations, and Cronbach's α for Main Variables

	Mean	<i>SD</i>	<i>N</i>	α
K-SADS Continuous Depression Score (Last Week)	36.12	11.99	198	.88
Perceived Effects of Negative Life Events on Self	11.79	9.47	198	--
Negative Cognitive Triad Total Score (CTI-C)	20.00	13.65	198	.94
CTI-C View of the Self Subscale	6.53	5.45	198	.88
CTI-C View of the World subscale	7.30	4.58	198	.80
CTI-C View of the Future Subscale	6.17	4.86	198	.86
Value of CTI-C "Weakest Link" Subscale	8.76	5.02	198	--
Negative Cognitive Style Total Score (CCSQ)	.56	.18	198	.88
CCSQ Causes/Attributional Style Subscale	.43	.13	198	.78
CCSQ Self-Inferences Subscale	.70	.28	198	.85
CCSQ Consequences Subscale	.73	.28	198	.86
Value of CCSQ Weakest Link Subscale	.41	.13	198	--

Table 3. Pearson Product Moment Correlations for Study Variables

	K- SADS	Life Events	CTI Tot	CTI Self	CTI World	CTI Future	CTI Weak	CSQ Tot	CSQ Cause	CSQ Self	CSQ Cons
K-SADS	1										
Depression											
Life Events	.179*	1									
CTI Total	-.460*	-.278*	1								
CTI Self	-.423*	-.283*	.943*	1							
CTI World	-.404*	-.237*	.886*	.757*	1						
CTI Future	-.435*	-.240*	.914*	.812*	.695*	1					
CTI Weak	-.423*	-.242*	.957*	.889*	.907*	.835*	1				
CCSQ Total	.332*	.142*	-.505*	-.472*	-.407*	-.504*	-.453*	1			
CCSQ Cause	.284*	.163*	-.432*	-.413*	-.338*	-.432*	-.389*	.784*	1		
CCSQ Self	.304*	.146*	-.504*	-.454*	-.426*	-.504*	-.471*	.906*	.603*	1	
CCSQ Cons	.266*	.065	-.365*	-.352*	-.283*	-.363*	-.307*	.870*	.497*	.687*	1
CCSQ Weak	.300*	.150*	-.481*	-.458*	-.388*	-.471*	-.441*	.901*	.887*	.743*	.721*

Table 4. Descriptive Statistics by Grade in School (4th & 5th Grades)

Measure	Grade 4 (<i>n</i> = 46)		Grade 5 (<i>n</i> = 56)	
	Mean	<i>SD</i>	Mean	<i>SD</i>
K-SADS IVR Total Depression Score (continuous)	38.17	9.79	34.02	12.05
Life Events Checklist (Sum of Perceived “Effects on Self” of Negative Life Events from the Prior Year)	12.00	10.46	11.36	9.65
Cognitive Triad Inventory for Children (CTI-C) Total Score	19.70	14.11	20.13	14.18
CTI-C View of Self Subscale	6.57	5.55	6.88	5.52
CTI-C View of World Subscale	6.74	4.95	7.02	4.77
CTI-C View of Future Subscale	6.39	4.84	6.23	5.09
Value of CTI-C weakest link Subscale	8.63	5.40	8.70	5.18
Children’s Cognitive Style Questionnaire (CCSQ) Total Score	.60	.18	.54	.18
CCSQ Attributional Style (Causes) Subscale	.45	.14	.43	.14
CCSQ Consequences Subscale	.76	.27	.67	.30
CCSQ Self-Inferences Subscale	.75	.25	.70	.29
Value of CCSQ weakest link Subscale	.44	.14	.40	.14

Note: CTI-C scores have been reverse scored for this study so that higher score indicate a more negative cognitive triad. CCSQ scores have undergone an inverse transformation in order to achieve a more normal distribution of scores.

Table 5. Descriptive Statistics by Grade in School (6th & 7th Grades)

Measure	Grade 6 (<i>n</i> = 44)		Grade 7 (<i>n</i> = 52)	
	Mean	<i>SD</i>	Mean	<i>SD</i>
K-SADS IVR Total Depression Score (continuous)	37.02	12.13	35.79	13.45
Life Events Checklist (Sum of Perceived “Effects on Self” of Negative Life Events from the Prior Year)	11.36	9.77	12.44	8.28
Cognitive Triad Inventory for Children (CTI-C) Total Score	20.57	13.60	19.65	13.05
CTI-C View of Self Subscale	6.30	5.19	6.31	5.65
CTI-C View of World Subscale	7.86	4.60	7.63	4.04
CTI-C View of Future Subscale	6.41	5.06	5.71	4.55
Value of CTI-C weakest link Subscale	8.98	5.04	8.77	4.63
Children’s Cognitive Style Questionnaire (CCSQ) Total Score	.53	.18	.58	.17
CCSQ Attributional Style (Causes) Subscale	.43	.15	.42	.11
CCSQ Consequences Subscale	.72	.29	.77	.27
CCSQ Self-Inferences Subscale	.62	.29	.73	.27
Value of CCSQ weakest link Subscale	.40	.14	.42	.11

Note: CTI-C scores have been reverse scored for this study so that higher score indicate a more negative cognitive triad. CCSQ scores have undergone an inverse transformation in order to achieve a more normal distribution of scores.

Main Analyses

Results for each hypothesis are show below. Hypotheses 1- 4 are simple, multiple regression analyses, each testing a different potential mediator of the relationship between negative life events and depressive symptoms. To test Beck's theory, scores on the CTI-C calculated using the traditional, additive method (H1) and the weakest link method (H2) were examined as potential mediators. To test Abramson's theory, scores on the CCSQ calculated using the traditional, additive method (H3) and the weakest link method (H4) were examined as potential mediators.

NEGATIVE LIFE EVENTS

For all four regression hypotheses, the independent variable is negative life events, as represented by the sum of perceived "effects on self" of negative life events on the Life Events Checklist (LEC) experienced over the prior year. Johnson (1982) designed the LEC as a means of measuring cumulative life change in children and adolescents. Measures of cumulative life change are based on the assumption that experiencing higher numbers of stressful events within a short period of time puts a child at the greatest risk for developing health problems. One of the advantages of using a measure of cumulative life change is that it can distinguish between two children who experience the same, specific life event differently. For example, one child might experience her parents' separation as a relief if it means the removal of an abusive parent from the home or it takes away the stress she was experiencing living with two parents who were fighting. However, another child might experience her parents' separation as highly stressful if she then experiences within a short period of time, divorce, financial difficulties, a parent having to get a new job, an increased absence of the parent from the home, moving to a new home, changing to a new school, and getting a new stepparent.

Table 6 Frequency of Negative Life Events and Mean “Effect on Self” Ratings

Life Event	<i>f</i>	\bar{X}
Trouble with brother or sister	91	1.96
Serious illness or injury to a family member	82	2.39
Trouble with classmates	73	1.92
Death of a family member	70	2.50
Losing a close friend	69	2.22
Major arguments between you and mom or dad	69	2.00
Change in parents’ financial status (less money at home)	51	2.06
Trouble with teacher	43	1.79
Making failing grades on a report card	39	2.23
Failing a grade	38	2.05
Breaking up with boyfriend/girlfriend	32	1.91
Moving to a new home	31	2.23
Increased absence of parent from home	30	2.13
Parents separated	29	2.38
Increase in number of arguments with parents	28	2.32
Parents divorced	26	2.58
Changing to a new school	25	2.16
Brother or sister leaving home	23	2.09
Mother or father lost job	22	2.00
Serious illness or injury of close friend	21	1.90
Major personal illness or injury	20	2.10
Parent getting into trouble with the law	15	2.47
Death of a close friend	14	2.43
Failing to make an athletic team	12	1.25
Parent getting a new job	8	2.13
Decrease in number of arguments with parents	7	2.00
New stepmother or stepfather	5	3.00
New brother or sister	5	2.40
Being suspended from school	5	2.40
Making up with boyfriend/girlfriend	5	2.20
New boyfriend or girlfriend	5	1.40
Getting into trouble with police	2	3.00
Making an athletic team	2	2.50
Special recognition for good grades	2	1.50
Parent going to jail	1	2.00
Joining a new club	1	1.00

DEPRESSIVE SYMPTOMS

All four hypotheses also use the same dependent variable, a continuous measure of depressive symptoms experienced in the last week, derived from K-SADS IV semi-structured, diagnostic clinical interviews.

RELATIONSHIP BETWEEN LIFE EVENTS AND DEPRESSION

Since the independent variable and the dependent variable are the same for all four hypotheses tested, the *c* path (i.e. total effects of life events on depression) is the same for all four models. As can be seen in Figure 11, there is a significant total effect of life events on depressive symptoms ($b = .23, p < .05$). This effect is positive, meaning that a greater quantity and magnitude of negative life events is associated with a greater number and severity of depressive symptoms. Interesting finding and one that is consistent with the literature.

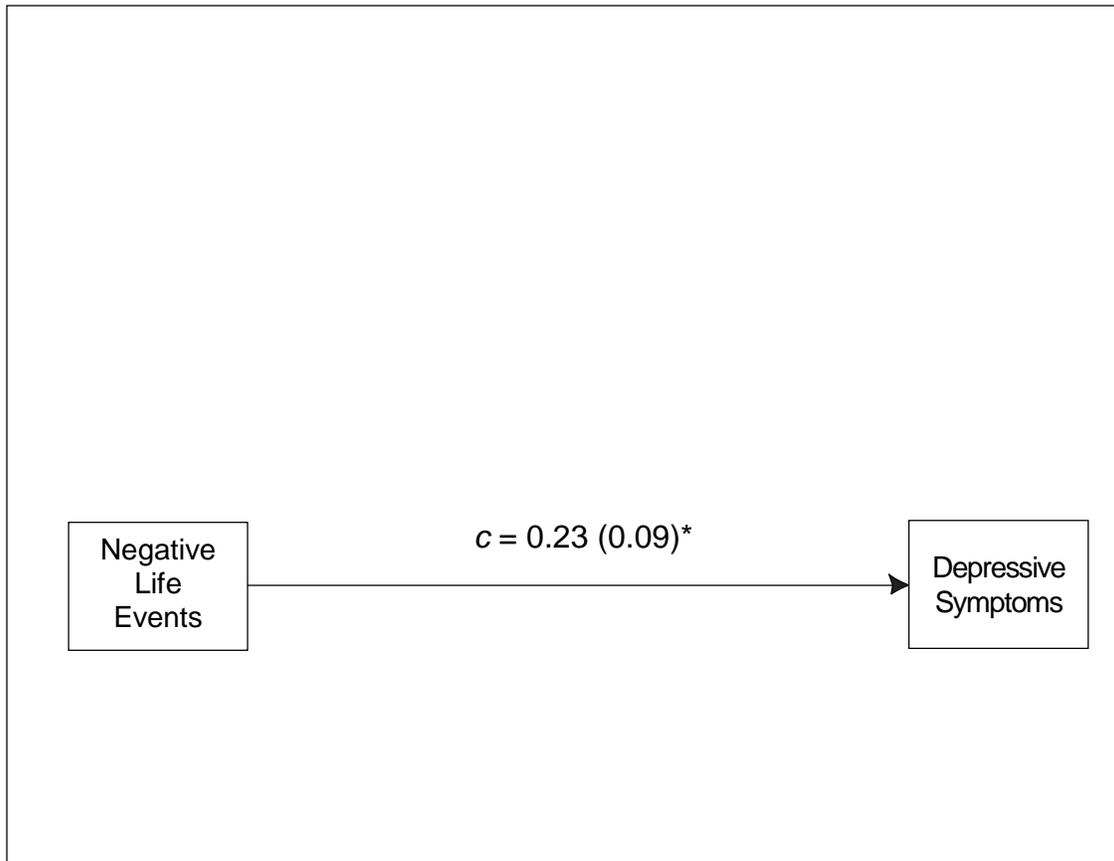


Figure 11. Total Effects of Negative Life Events on Depression

* $p < .05$

Hypothesis 1

As a test of Beck's model, this hypothesis proposed that the experience of negative life events (X) leads to symptoms of depression (Y) as a result of negative attitudes and beliefs about the self, personal world, and future (M) activated by the experience of those negative life events, which in turn leads to an increase in behavioral, affective, somatic, and motivational symptoms of depression. More specifically, perceived negative effects of stressful life events result in negative beliefs about the self, world, and future, and the more such beliefs result, the greater the increase in depressive symptomology. For this hypothesis, a negative cognitive triad total score was the hypothesized mediator of the effect of the experience of negative life events on depression.

As can be seen in Figure 12, the proposed mediator, negative cognitive triad total score (CTI-C) was regressed on negative life events (X) to produce a , and depression was regressed on both the negative cognitive triad total score and negative life events, which yielded b and c' , respectively. The results can be conceptualized in the form of the following Ordinary Least Squares regression models:

$$\hat{M} = 15.28 + .40X \quad (1)$$

$$\hat{Y} = 27.49 + .07X + .39M \quad (2)$$

A summary of the model coefficients for Hypothesis 1 can be seen in Table 6. Additionally, a brief explanation of the meaning of those results is presented here: Multiplying the a path (.40) and the b path (.39) yields the indirect effect, ab , equal to .16. This indirect (meditational) effect of .16 means that two girls who differ by one unit in their reported "effect on self" of negative life events are estimated to differ by .16 units

in their reported K-SADS depressive symptoms as a result of the tendency for those who experience relatively more “effects on self” of negative life events to have a more negative cognitive triad. This in turn translates into greater levels of depressive symptoms. This indirect effect is statistically different from zero, as revealed by a 95% bias-corrected bootstrap confidence interval that is entirely above zero (.07 to .27). Note that tests of significance of indirect effects for all hypotheses in this study use confidence intervals derived from 5,000 bootstrap resamples.

The direct effect of negative life events, $c' = .07$, is the estimated difference in K-SADS depressive symptoms between two children who have similar negative cognitive triad total scores, but differ by one unit in their perceived “effects on self” of negative life events. The coefficient is positive, meaning that one child who is experiencing more negative life events than another child, but who has a similar view of the self, world, and future is estimated to be .07 units higher in her level of K-SADS depressive symptoms. However, this direct effect is not statistically different from zero, $t(195) = .89, p = .38$, with a 95% confidence interval from -.09 to .23.

The total effect of negative life events on depressive symptoms is derived by summing the direct and indirect effects, or by regressing depressive symptoms on negative life events by itself: $c = c' + ab = .07 + .16 = .23$. This means that two children who differ by one unit in their perceived “effects on self” of negative life events are estimated to differ by .23 units in their K-SADS depressive symptoms. The positive sign means that a child who experiences a greater number and magnitude of “effects on self” of negative life events reports higher levels of depressive symptoms. This effect is statistically significant from zero, $t(196) = 2.60, p < .05$.

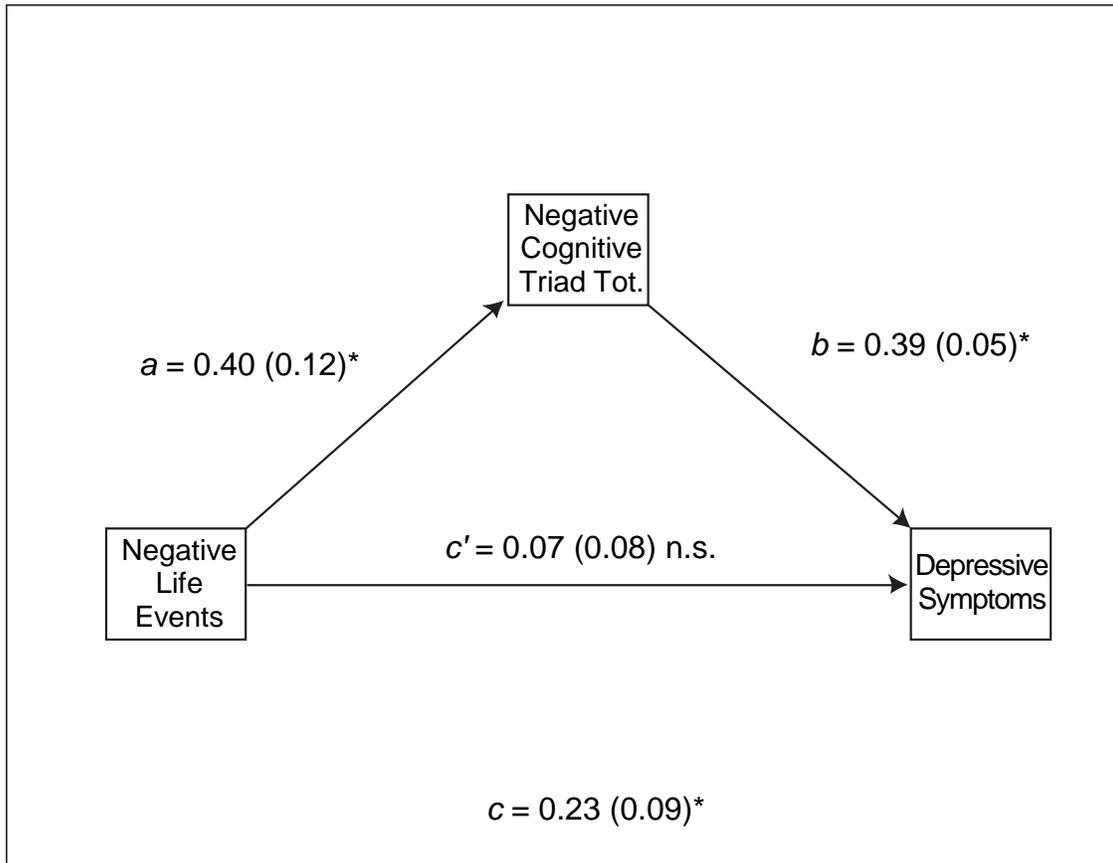


Figure 12. Path Coefficients for Hypothesis 1 (CTI-C Total Score as Mediator)

Figure 12 depicts results of Hypothesis 1, a test of Beck’s Model, using the Children’s Cognitive Triad Inventory (CTI-C) total score as the mediator between negative life events and depressive symptoms. The direct effect of X on $Y = c'$. The indirect effect of X on Y through $M_i = a_i b_i$

* $p < .05$

Table 7. Model Coefficients for H₁ (Beck's Cognitive Triad Total Score)

	<i>M</i> (CTI-C TOTAL)			<i>Y</i> (DEPRESSION)				
		Coeff	<i>SE</i>	<i>p</i>	Coeff	<i>SE</i>	<i>p</i>	
<i>X</i> (LIFE EVENTS)	<i>a</i>	.40	.12	< .05	<i>c'</i>	.07	.08	.38
<i>M</i> (CTI-C TOT.)		--	--	--	<i>b</i>	.39	.05	< .05
constant	<i>i</i> ₁	15.28	1.54	< .05	<i>i</i> ₂	27.49	1.51	< .05
		$R^2 = .08$				$R^2 = .21$		
		$F(1, 196) = 11.37, p < .05$				$F(2, 195) = 34.49, p < .05$		

Hypothesis 2

For this hypothesis, a negative cognitive triad weakest link score was the hypothesized mediator of the effect of the experience of negative life events on depression. As a developmentally-sensitive test of Beck's model, this hypothesis proposed that the experience of negative life events (X) leads to symptoms of depression (Y) as a result of negative attitudes and beliefs about either the self, or the personal world, or the future (M) activated by the experience of those negative life events, which in turn leads to an increase in symptoms of depression. More specifically, perceived negative effects of stressful life events result in negative beliefs about either the self, or the world, or the future-- whichever subscale of the CTI-C is most depressotypic-- and the more such beliefs result, the greater the increase in depressive symptoms.

As can be seen in Figure 13., the proposed mediator, negative cognitive triad weakest link score (CTI-C) was regressed on negative life events (X) to produce a , and the K-SADS depression score was regressed on both the negative cognitive triad weakest link score and negative life events, which yielded b and c' , respectively. The results can be conceptualized in the form of the following OLS regression models:

$$\hat{M} = 7.17 + .14X \quad (1)$$

$$\hat{Y} = 26.66 + .10X + .95M \quad (2)$$

A summary of the model coefficients for Hypothesis 2 can be seen in Table 7. In addition, a brief explanation of the meaning of those results is presented here: Multiplying the a path (.14) and the b path (.95) yields the indirect effect, ab , equal to .13. This indirect (meditational) effect of .13 means that two girls who differ by one unit in their reported "effect on self" of negative life events are estimated to differ by .13 units

in their reported K-SADS depressive symptoms as a result of the tendency for those who experience relatively more “effects on self” of negative life events to have a more negative weakest link of the cognitive triad. This in turn translates into greater levels of depressive symptoms. This indirect effect is statistically different from zero, as revealed by a 95% bias-corrected bootstrap confidence interval that is entirely above zero (.05 to .23). (Tests of significance of indirect effects for all hypotheses in this study use confidence intervals derived from 5,000 bootstrap resamples.)

The direct effect of negative life events, $c' = .10$, is the estimated difference in K-SADS depressive symptoms between two children who have similar negative cognitive triad weakest link scores, but differ by one unit in their perceived “effects on self” of negative life events. The coefficient is positive, meaning that one child who is experiencing more negative life events than another child, but who has a similar weakest link on the Children’s Cognitive Triad Inventory (CTI-C) is estimated to be .10 units higher in her level of K-SADS depressive symptoms. However, this direct effect is not statistically different from zero, $t(195) = 1.20$, $p = .23$, with a non-significant 95% confidence interval from -.06 to .26.

The total effect of negative life events on depressive symptoms, which is the same for all four meditational hypotheses in this study, is derived by adding the direct and indirect effects, or by regressing depressive symptoms on negative life events by itself: $c = c' + ab = .10 + .13 = .23$. This means that two children who differ by one unit in their perceived “effects on self” of negative life events are estimated to differ by .23 units in their K-SADS depressive symptoms. The positive sign means that the child experiencing greater “effects on self” of negative life events reports higher levels of depressive symptoms. This effect is statistically significant from zero, $t(196) = 2.60$, $p < .05$.

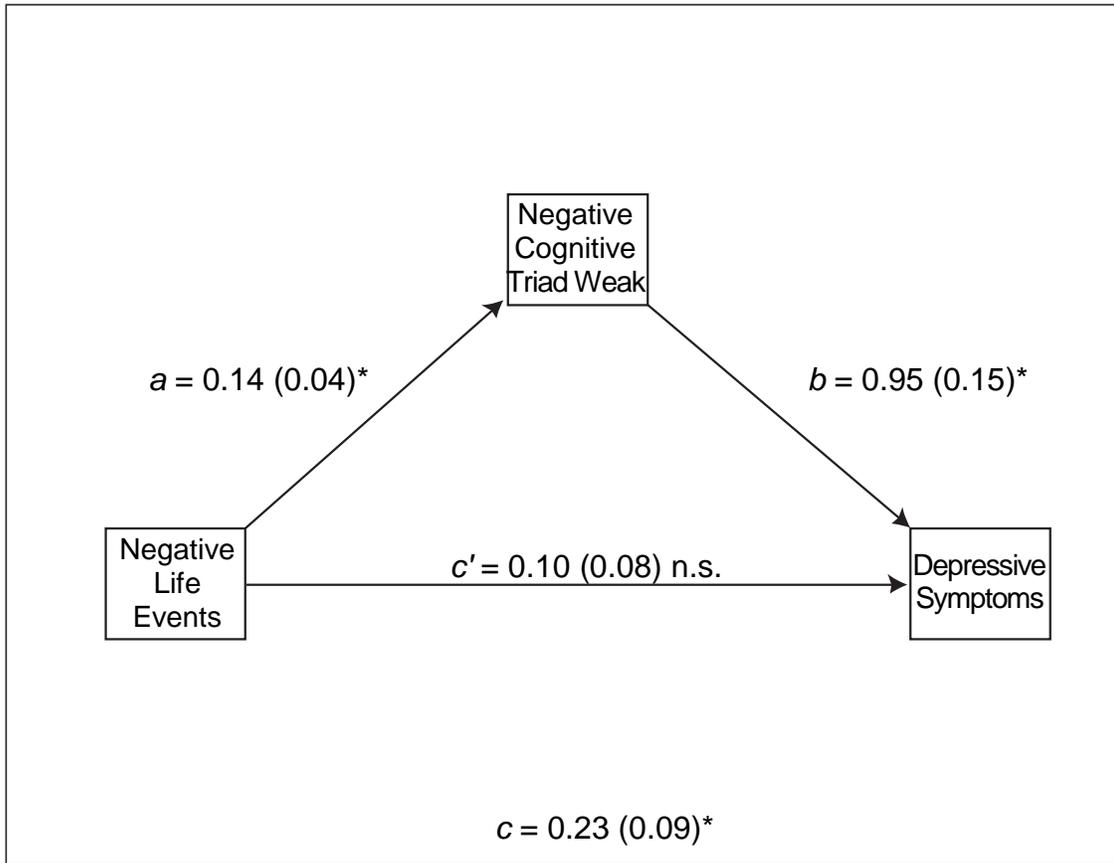


Figure 13. Path Coefficients for Hypothesis 2 (CTI-C Weakest Link as Mediator)

Figure 13 depicts the results of Hypothesis 2, a test of Beck’s model with the cognitive triad as a mediator between negative life events and depression, this time calculated using the Weakest Link method. Note that the total effect (no mediator in the model) is $c' = 0.23 (0.09)^*$. The direct effect of X on $Y = c'$. The indirect effect of X on Y through $M_i = a_i b_i$

* $p < .05$

Table 8. Model Coefficients for H₂ (Beck's Cognitive Triad Weakest Link)

	<i>M</i> (CTI-C WEAK)			<i>Y</i> (DEPRESSION)				
		Coeff	<i>SE</i>	<i>p</i>	Coeff	<i>SE</i>	<i>p</i>	
<i>X</i> (LIFE EVENTS)	<i>a</i>	.14	.04	< .05	<i>c'</i>	.10	.08	.23
<i>M</i> (CTI-C WEAK)		--	--	--	<i>b</i>	.95	.15	< .05
constant	<i>i</i> ₁	7.17	.58	< .05	<i>i</i> ₂	26.66	1.69	< .05
		$R^2 = .07$				$R^2 = .18$		
		$F(1, 196) = 9.88, p < .05$				$F(2, 195) = 27.36, p < .05$		

Hypothesis 3

As a test of Abramson's model, this hypothesis proposed that the experience of negative life events (X) leads to symptoms of depression (Y) as a result of a negative inferential style about the causes and consequences of negative life events and about the self in the context of negative life events (M) activated by the experience of those negative life events, which in turn leads to an increase in depressive symptoms. More specifically, the perceived negative effects of stressful life events result in the tendency to make negative inferences about the causes, consequences of, and self in context of negative life events, and the more such a negative inferential style increases, the more depressive symptoms increase. For this hypothesis, a negative cognitive style total score on the CCSQ was the hypothesized mediator of the effect of the experience of negative life events on depression.

As can be seen in Figure 14., the proposed mediator, negative cognitive style total score was regressed on negative life events (X) to produce a , and depression was regressed on both negative cognitive style total score and negative life events, which yielded b and c' , respectively. These results can be conceptualized in the form of the following OLS regression models:

$$\hat{M} = 7.67 - .01X \quad (1)$$

$$\hat{Y} = 13.86 + .15X - 19.63M \quad (2)$$

A summary of the model coefficients for Hypothesis 3 can be seen in Table 8. However, a brief explanation of the meaning of those results is presented here: Multiplying the a path (-.01) and the b path (-19.63) yields the indirect effect, ab , equal to .20. This indirect (meditational) effect of .20 means that two girls who differ by one unit in their reported

“effect on self” of negative life events are estimated to differ by .20 units in their reported K-SADS depressive symptoms as a result of the tendency for those who experience relatively more “effects on self” of negative life events to have a more negative cognitive inferential style. This in turn translates into greater levels of depressive symptoms. This indirect effect is statistically different from zero, as revealed by a 95% bias-corrected bootstrap confidence interval that is entirely above zero (.02 to .16). Note that tests of significance of indirect effects for all hypotheses in this study use confidence intervals derived from 5,000 bootstrap resamples.

The direct effect of negative life events, $c' = .15$, is the estimated difference in K-SADS depressive symptoms between two children who have similar negative cognitive inferential style total scores, but differ by one unit in their perceived “effects on self” of negative life events. The coefficient is positive, meaning that one child who is experiencing more negative life events than another child, but who has a similar negative cognitive style is estimated to be .15 units higher in her level of K-SADS depressive symptoms. However, this direct effect is not statistically different from zero, $t(195) = 1.68, p = .10$, with a 95% confidence interval from -.03 to .33.

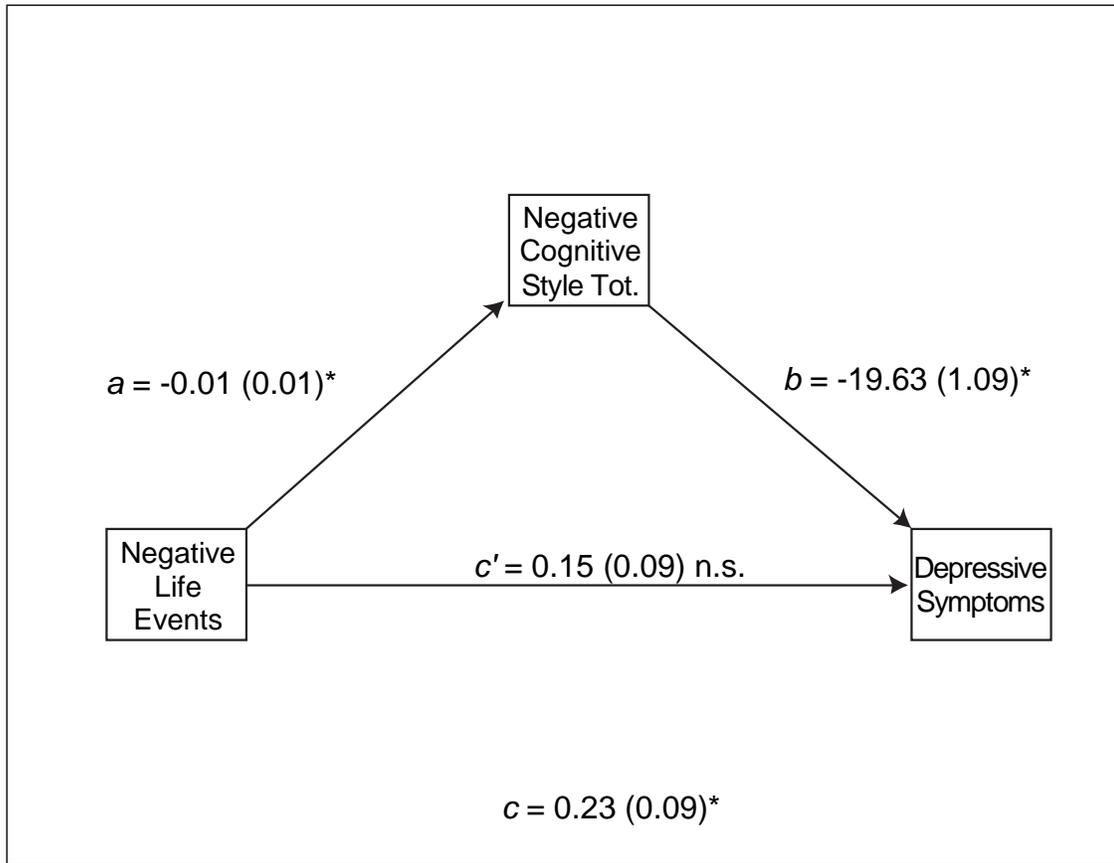


Figure 14. Path Coefficients for Hypothesis 3 (CCSQ Total Score as Mediator)

Figure 14 depicts the results of Hypothesis 3, a test of Abramson's hopelessness model of depression with the total negative cognitive style score on the CCSQ as a mediator between negative life events and depressive symptoms. Note that the total effect (no mediator in the model) is $c' = 0.23 (0.09)^*$. The direct effect of X on $Y = c'$. The indirect effect of X on Y through $M_i = a_i b_i$

* $p < .05$

Table 9. Model Coefficients for H₃ (Abramson's Cognitive Style Total Score)

	<i>M</i> (CCSQ TOTAL)				<i>Y</i> (DEPRESSION)			
		Coeff	<i>SE</i>	<i>p</i>		Coeff	<i>SE</i>	<i>p</i>
<i>X</i> (LIFE EVENTS)	<i>a</i>	-.01	.01	< .05	<i>c'</i>	.15	.09	.06
<i>M</i> (CCSQ TOT.)		--	--	--	<i>b</i>	-19.63	4.65	< .05
constant	<i>i</i> ₁	.61	.02	< .05	<i>i</i> ₂	45.34	3.18	< .05
		$R^2 = .04$				$R^2 = .11$		
		$F(1, 196) = 7.67, p < .05$				$F(2, 195) = 13.86, p < .05$		

Hypothesis 4

For Hypothesis 4, a negative cognitive style weakest link score was the hypothesized mediator of the effect of the experience of negative life events on depression. As a developmentally-sensitive test of Abramson's hopelessness model, this hypothesis proposed that the experience of negative life events (X) leads to symptoms of depression (Y) as a result of the tendency to make negative inferences about either the causes of negative life events, or the potential consequences of negative life events or to make negative inferences about the self in the context of negative life events (M) activated by the experience of those negative life events, which in turn leads to an increase in symptoms of depression. More specifically, perceived negative effects of stressful life events result in the tendency to make negative judgments about either the causes of negative life events or the consequences of negative life events, or the self in the context of negative events -- whichever subscale of the CCSQ is most depressotypic-- and the more such beliefs result, the greater the increase in depressive symptoms.

As can be seen in Figure 15, the proposed mediator, negative cognitive style weakest link score was regressed on negative life events (X) to produce a , and depression was regressed on both the negative cognitive style weakest link score and negative life events, which yielded b and c' , respectively. A summary of the model coefficients for Hypothesis 4 can be seen in Table 9. In addition, a brief explanation of the meaning of those results is presented here:

Multiplying the a path (-.01) and the b path (-21.42) yields the indirect effect, ab , equal to .21. This indirect (meditational) effect of .21 means that two girls who differ by one unit in their reported "effect on self" of negative life events are estimated to differ by .21 units in their reported K-SADS depressive symptoms as a result of the tendency for those who experience relatively greater "effects on self" of negative life events to have a

more negative weakest link cognitive inferential style. This in turn translates into greater levels of depressive symptoms. This indirect effect is statistically different from zero, as revealed by a 95% bias-corrected bootstrap confidence interval that is entirely above zero (.01 to .13). (Tests of significance of indirect effects for all hypotheses in this study use confidence intervals derived from 5,000 bootstrap resamples.)

The direct effect of negative life events, $c' = .17$, is the estimated difference in K-SADS depressive symptoms between two children who have similar negative cognitive style weakest link scores, but differ by one unit in their perceived “effects on self” of negative life events. The coefficient is positive, meaning that one child who is experiencing more negative life events than another child, but who has a similar “weakest link” on the Children’s Cognitive Style Questionnaire (CCSQ) is estimated to be .17 units higher in her level of K-SADS depressive symptoms. However, this direct effect is not statistically different from zero, $t(195) = 1.91, p = .06$.

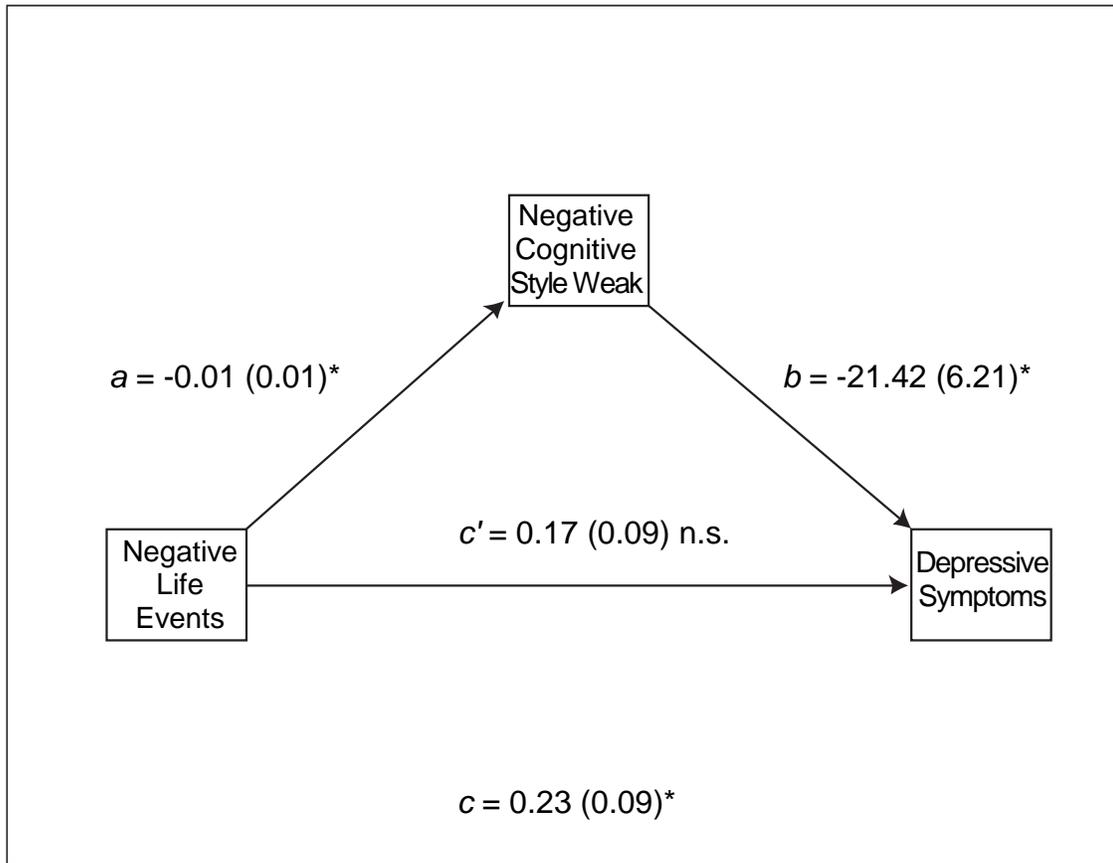


Figure 15. Path Coefficients for Hypothesis 4 (CCSQ Weakest Link as Mediator)

Figure 15 depicts the results of Hypothesis 4, a test of Abramson's hopelessness model of depression with cognitive inferential style as the mediator between negative life events and depression, this time calculated using the weakest link method. Note that the total effect (no mediator in the model) is $c' = 0.23 (0.09)^*$. The direct effect of X on $Y = c'$. The indirect effect of X on Y through $M_i = a_i b_i$

* $p < .05$

Table 10. Model Coefficients for H₄ (Abramson's Cognitive Style Weakest Link)

	<i>M</i> (CCSQ WEAK)				<i>Y</i> (DEPRESSION)			
		Coeff	<i>SE</i>	<i>p</i>		Coeff	<i>SE</i>	<i>p</i>
<i>X</i> (LIFE EVENTS)	<i>a</i>	-.01	.01	< .05	<i>c'</i>	.17	.09	.06
<i>M</i> (CCSQ WEAK)		--	--	--	<i>b</i>	-21.42	6.21	< .05
constant	<i>i</i> ₁	2.50	.10	< .05	<i>i</i> ₂	23.09	3.09	< .05
		$R^2 = .02$				$R^2 = .11$		
		$F(1, 196) = 3.82, p = .05$				$F(2, 195) = 10.89, p < .05$		

Hypothesis 5

Hypothesis 5 was an exploratory analysis to see if there was a categorical association between grade in school and category of weakest link subscale on the CTI-C. It was hypothesized that there would be a categorical association between a child's grade level in school and the (name of) the subscale on the Children's Cognitive Triad Inventory that represents her weakest link. As can be seen in Table 7, however, the percentage of participants in any one category of "weakest link" on the CTI-C did not vary by grade in school. $\chi^2 (9, N = 198) = 13.94 \quad p = .12$.

However, a visual inspection of the bar chart in Figure 16, does suggest a possible trend in which an increasing percentage of students in the older grades in school have "negative view of the world" as their weakest link of the three facets of Beck's cognitive triad. Although the trend is not significant in this particular sample, it should be explored further in future studies.

Table 11. Grade * Category of CTI-C Weakest Link

		Category of “Weakest Link” on CTI-C				
		Self	World	Future	more than one category	Total
4th	Count	12	11	13	10	46
	% within Grade	26.1%	23.9%	28.3%	21.7%	100%
5th	Count	11	18	15	12	56
	% within Grade	19.6%	32.1%	26.8%	21.4%	100%
6th	Count	7	19	8	10	44
	% within Grade	15.9%	43.2%	18.2%	22.7%	100%
7th	Count	10	27	4	11	52
	% within Grade	19.2%	51.9%	7.7%	21.2%	100%
Total	Count	40	75	40	43	198
	% within Grade	20.2%	37.9%	20.2%	21.7%	100%

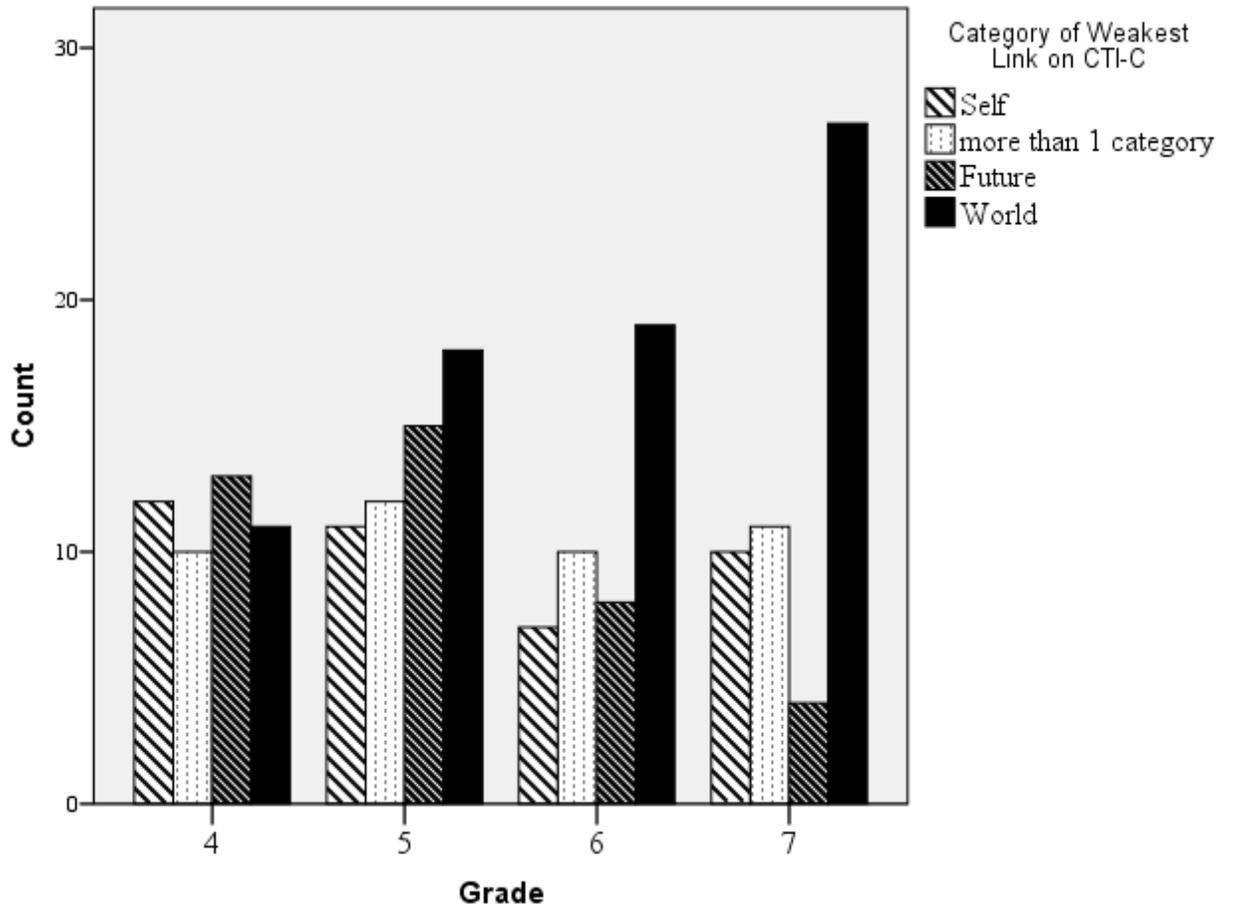


Figure 16. CTI-C Weakest Link Categories by Grade in School

Hypothesis 6

As with Hypothesis 5, Hypothesis 6 was an exploratory analysis of the relationship between grade in school and category of Weakest Link, this time on the CCSQ. It was hypothesized that there would be a categorical association between a child's grade level in school and the (name of) the subscale on the CCSQ that represents her Weakest Link. As can be seen in Table 8, however, the percentage of participants in any one category of weakest link on the CCSQ did not vary by grade in school. $\chi^2 (9, N = 198) = 13.05 \quad p = .16$.

Although the results did not vary by grade in school, an interesting trend was evident in the bar graph in Figure 17. Specifically, 76.3% of the entire sample had the causes/attributional style subscale of the CCSQ as their weakest link. This finding could mean that the consequences and the self-inferences subscales measure constructs that do not become salient until sometime after the 7th grade. However, it is also possible that there are structural issues with the way the CCSQ is constructed that affect the validity of its consequences and self-inferences subscales.

Table 12. Grade * Category of CCSQ Weakest Link

		Category of Weakest Link on CCSQ					
		more than one category	Attribution/ Causes	Self- Inferences	Conse- quences	Total	
4th	Count	2	38	1	5	46	
	% within Grade	4.3%	82.6%	2.2%	10.9%	100%	
5th	Count	4	39	8	5	56	
	% within Grade	7.1%	69.6%	14.3%	8.9%	100%	
6th	Count	2	29	9	4	44	
	% within Grade	4.5%	65.9%	20.5%	9.1%	100%	
7th	Count	1	45	4	2	52	
	% within Grade	1.9%	86.5%	7.7%	3.8%	100%	
Total	Count	9	151	22	16	198	
	% within Grade	4.5%	76.3%	11.1%	8.1%	100%	

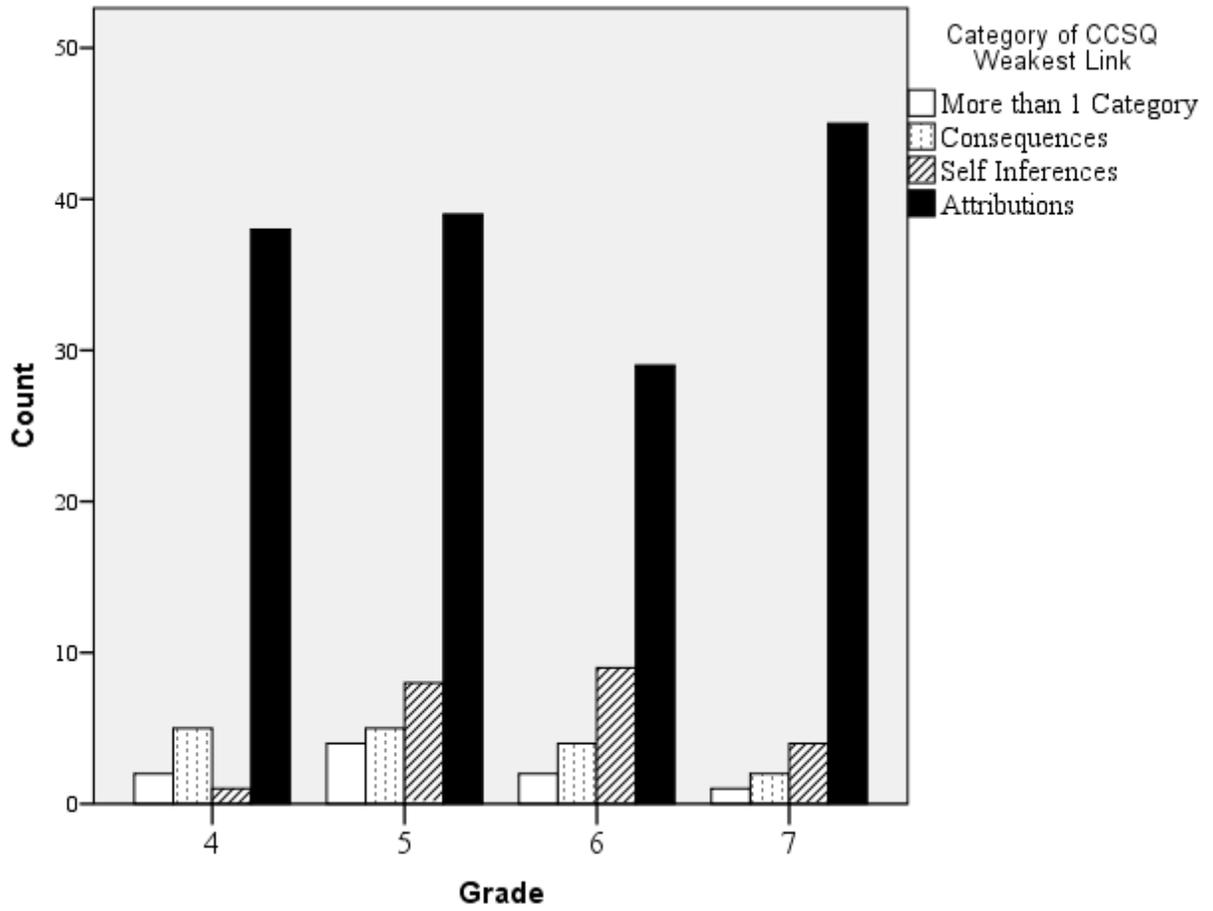


Figure 17. CCSQ Weakest Link Categories by Grade in School

Secondary Analyses

After the six main hypotheses were tested, two issues arose from the results that were explored further. First, the distributions of the individual subscale scores of the Children’s Cognitive Style Questionnaire (CCSQ), as well as patterns of responses to the individual questions were briefly explored visually. Second, the simple mediation models tested in hypotheses 1 through 4 (i.e. tests of Beck’s and Abramson’s cognitive vulnerability-stress models of depression) were retested with “grade in school” entered into each model as a potential moderator of the *a* path, the *b* path, and the *c*’ path in the mediation models. This type of moderated mediation is known as conditional process analysis and was used to see if the significant mediation effects found in hypotheses 1 through 4 were significant for children at all grade levels in the sample or just for the older children.

CHILDREN’S COGNITIVE STYLE QUESTIONNAIRE: SCORE DISTRIBUTIONS

The finding in Hypothesis 6 that 76.3% of the entire sample had the “causes”/attributions subscale on Children’s Cognitive Style Questionnaire (CCSQ) as their weakest link, combined with the finding from the preliminary analyses that the distribution of total scale scores on the CCSQ had a severe right-skew, but the “weakest link” score had a fairly normal distribution led to a brief exploration of the distribution of scores on the separate subscales of the CCSQ to see if there was something in the structure of the subscales that was leading to the skewed distribution of the CCSQ total scale scores.

The weakest link method calls for replacing a participant’s total CCSQ score with her score on a single subscale—whichever one indicates the most depressogenic

cognitive style, among the “causes,” consequences, and self-inferences subscales. Since 76.3% of the entire sample had the “causes” (attributional style) subscale as their weakest link, the distributions of all three subscale were then checked separately for normality to see if perhaps a structural problem with the questionnaire was causing the CCSQ total scores to be skewed.

As can be seen in Figure 18. the “causes” (attributional style) subscale of the CCSQ had an adequately normal distribution of scores.

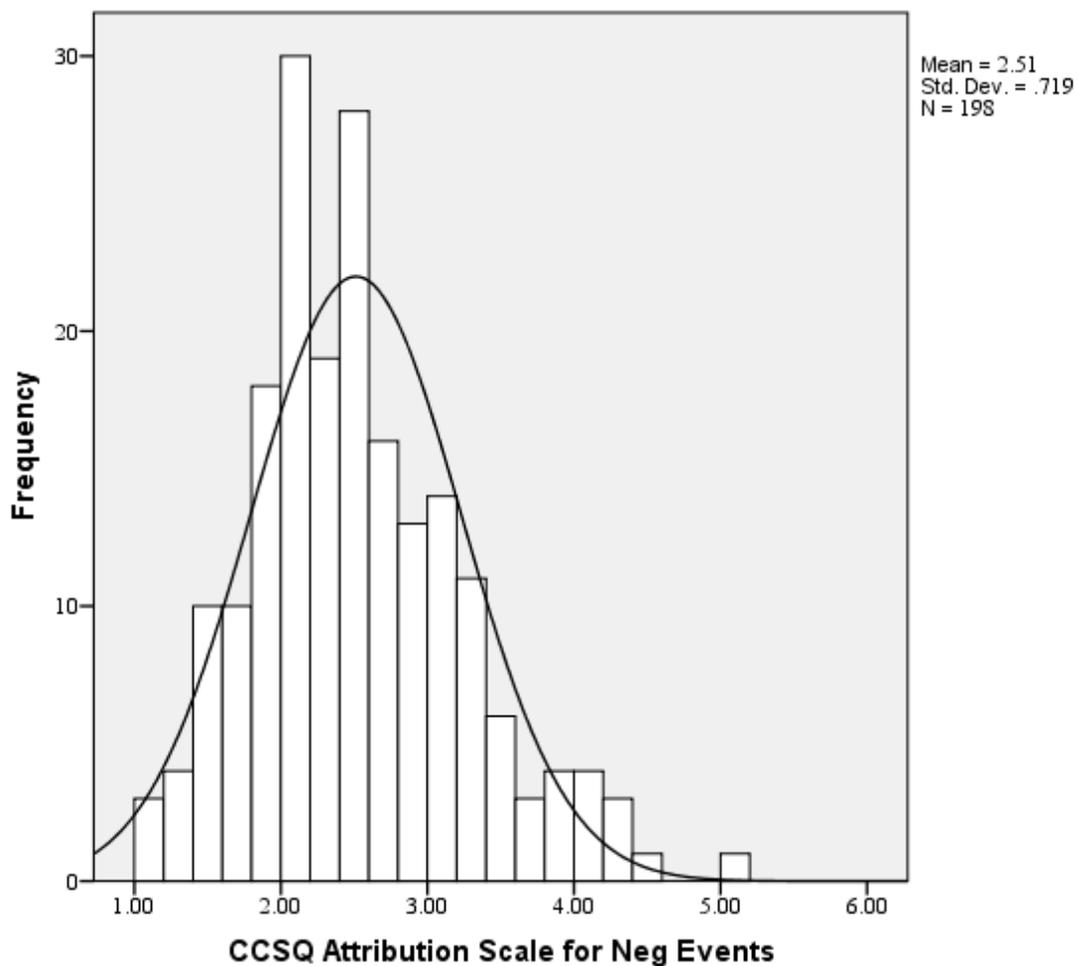


Figure 18. Distribution of CCSQ “Causes” Subscale Scores

However, the “consequences” subscale and “self-inferences” subscale, which can be seen in Figure 19 and Figure 20, respectively, were both highly skewed in the same direction. On a scale from 1 (“don’t agree at all”) to 5 (“agree a lot”), a majority of all participants in the study gave a rating of “1” to every item on both subscales. As can be seen in the histograms for the consequences and self-inferences subscales of the CCSQ, the high frequency of 1 “don’t agree at all” responses caused the skewed distributions on both subscales.

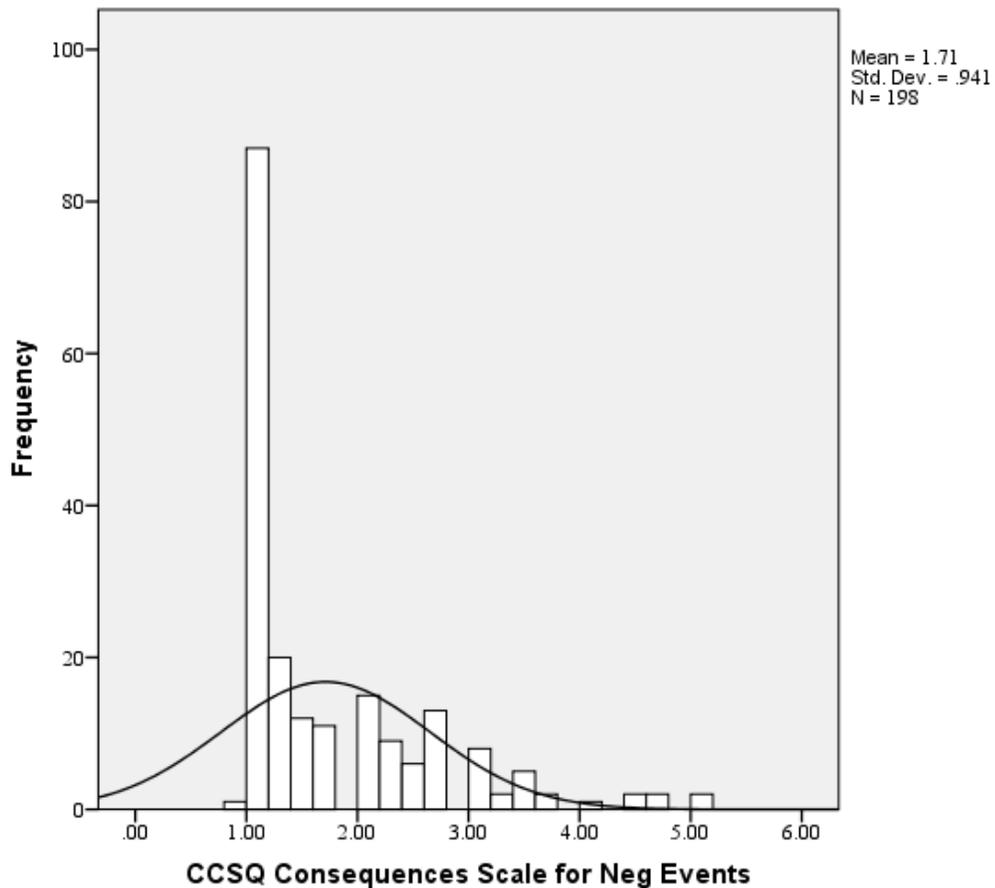


Figure 19. Distribution of CCSQ “Consequences” Subscale Score

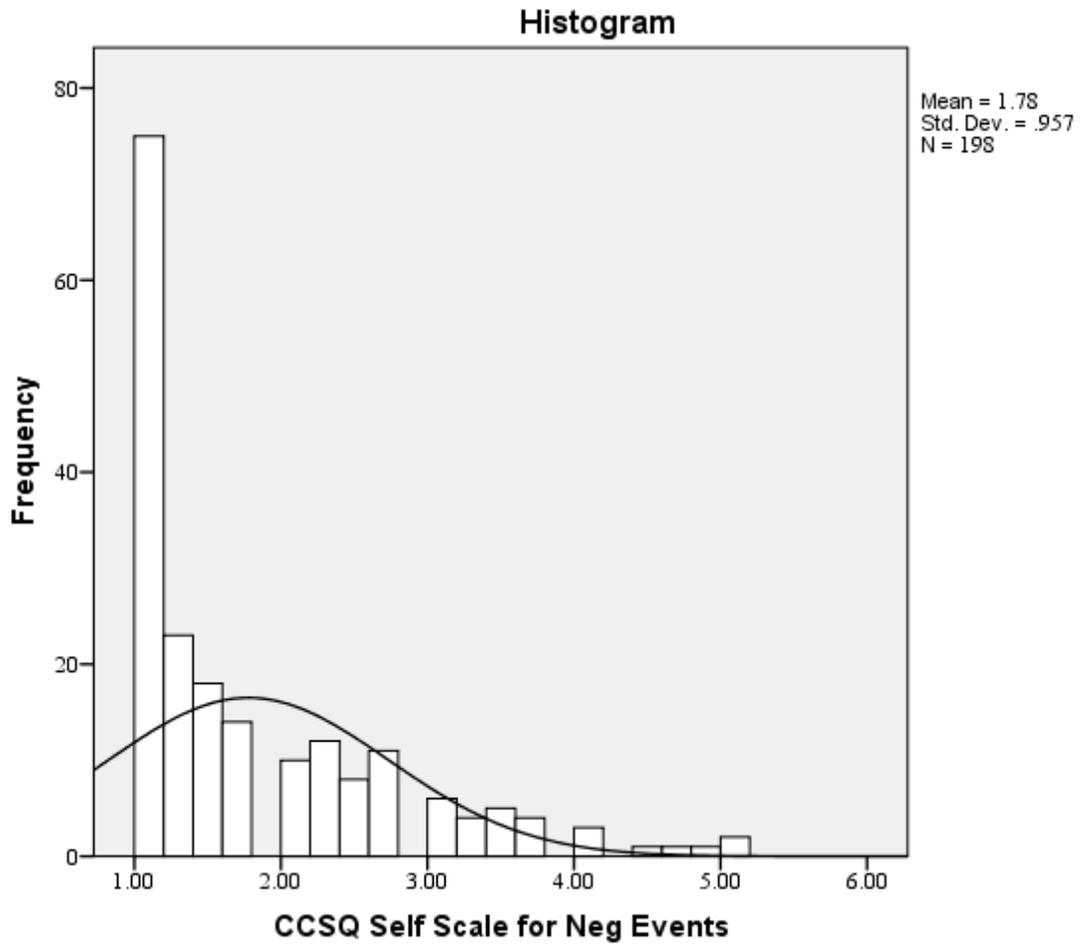


Figure 20. Distribution of CCSQ “Self-inferences” Subscale Scores

An examination of the frequency of responses to each item on the self-inferences subscale of the CCSQ (in Table 9) revealed a similarly skewed distribution at the item level.

Table 13. CCSQ Self-Inferences Subscale-- Item Response Frequencies

4a. *If kids wouldn't let me play with them, it probably means there is something wrong with me.*

	Frequency	Percent	Cumulative Percent
1 <i>don't agree at all</i>	108	54.5	54.5
2 <i>agree a little</i>	34	17.2	71.7
3 <i>sort of agree</i>	25	12.6	84.3
4 <i>mostly agree</i>	19	9.6	93.9
5 <i>agree a lot</i>	12	6.1	100.0
Total	198	100.0	

4b. *If I did bad on a math test, it means there is something wrong with me.*

	Frequency	Percent	Cumulative Percent
1 <i>don't agree at all</i>	121	61.1	61.1
2 <i>agree a little</i>	34	17.2	78.3
3 <i>sort of agree</i>	22	11.1	89.4
4 <i>mostly agree</i>	13	6.6	96.0
5 <i>agree a lot</i>	8	4.0	100.0
Total	198	100.0	

Table 13. CCSQ Self-Inferences Subscale-- Item Response Frequencies continued

4c. *If I got the answers wrong, it means there is something wrong with me.*

	Frequency	Percent	Cumulative Percent
1 <i>don't agree at all</i>	132	66.7	66.7
2 <i>agree a little</i>	34	17.2	83.8
3 <i>sort of agree</i>	19	9.6	93.4
4 <i>mostly agree</i>	8	4.0	97.5
5 <i>agree a lot</i>	5	2.5	100.0
Total	198	100.0	

4d. *If my friend wouldn't talk to me, it means there is something wrong with me.*

	Frequency	Percent	Cumulative Percent
1 <i>don't agree at all</i>	121	61.1	61.1
2 <i>agree a little</i>	35	17.7	78.8
3 <i>sort of agree</i>	21	10.6	89.4
4 <i>mostly agree</i>	12	6.1	95.5
5 <i>agree a lot</i>	9	4.5	100.0
Total	198	100.0	

Whether it was for a hypothetical achievement scenario (i.e. doing badly on a math test or getting the answers wrong about a story in class) or a hypothetical relationship scenario (i.e. being excluded from playing a game or getting the silent treatment from a friend), a majority of respondents strongly disagreed with the suggestion that such scenarios would mean “there is something wrong with me.”

Similarly, with the consequences subscale of the CCSQ, the skewed distribution was also visible at the item level, with a majority of kids answering 1 “don’t agree all” to every question on the subscale. Table 10 shows item response frequencies.

Table 14. CCSQ Consequences Subscale-- Item Response Frequencies

5a. *If kids wouldn't let me play with them, other bad things will probably happen to me.*

	Frequency	Percent	Cumulative Percent
1 <i>don't agree at all</i>	127	64.1	64.1
2 <i>agree a little</i>	30	15.2	79.3
3 <i>sort of agree</i>	21	10.6	89.9
4 <i>mostly agree</i>	11	5.6	95.5
5 <i>agree a lot</i>	9	4.5	100.0
Total	198	100.0	

5b. *If I did bad on a math test, other bad things will probably happen to me.*

	Frequency	Percent	Cumulative Percent
1 <i>don't agree at all</i>	124	62.6	62.6
2 <i>agree a little</i>	36	18.2	80.8
3 <i>sort of agree</i>	22	11.1	91.9
4 <i>mostly agree</i>	6	3.0	94.9
5 <i>agree a lot</i>	10	5.1	100.0
Total	198	100.0	

Table 14. CCSQ Consequences Subscale-- Item Response Frequencies continued

5c. *If I got the answers wrong, other bad things will probably happen to me.*

	Frequency	Percent	Cumulative Percent
1 <i>don't agree at all</i>	122	61.6	61.6
2 <i>agree a little</i>	37	18.7	80.3
3 <i>sort of agree</i>	23	11.6	91.9
4 <i>mostly agree</i>	5	2.5	94.4
5 <i>agree a lot</i>	11	5.6	100.0
Total	198	100.0	

5d. *If my friend wouldn't talk to me, other bad things will probably happen to me.*

	Frequency	Percent	Cumulative Percent
1 <i>don't agree at all</i>	124	62.6	62.6
2 <i>agree a little</i>	36	18.2	80.8
3 <i>sort of agree</i>	22	11.1	91.9
4 <i>mostly agree</i>	9	4.5	96.5
5 <i>agree a lot</i>	7	3.5	100.0
Total	198	100.0	

Although this was just a brief visual inspection of the frequency of responses to the items on the CCSQ subscales, two potential structural problems stood out that should be explored further in future studies. First, all of the items on the self-inferences subscale end with the wording, “it means there is something wrong with me” and all of the items

on the consequences subscale end with the wording, “other bad things will probably happen to me.” This raises the question as to whether using the same wording for every item on a subscale might artificially inflate the reliability of responses while not necessarily being a valid measure of all the facets of the construct it purports to assess. In other words, children might answer all of the questions on the subscale the same way, simply because they are worded the same way.

For a variety of reasons, it is possible that a child might have a pattern of making depressotypic inferences about the potential consequences of negative events, but not relate to the wording, “other bad things will probably happen to me.” For example, a younger child might respond to the question literally and try to provide the correct answer. After all, causal reasoning is not just a cognitive skill that develops on its own in middle childhood; rather students are taught about and tested upon the veracity of cause-and-effect relationships in a host of subjects across the curriculum.

Second, the individual items on the CCSQ subscales are rated from 1 to 5, but about 90% of the sample in this study provided responses ranging from 1 to 3 for every item on both the “consequences” and the “self-inferences” subscales. This pattern, which can be seen in the cumulative percent totals in the frequency tables for each item in Table 9 and Table 10, may be an anomaly due to the composition of the particular sample used in this study, but it should be explored further with other samples of children in the future. If there is a recurring pattern of 90% percent of respondents using a truncated portion of the response scale (i.e. providing responses between 1 and 3 on a scale that ranges from 1 to 5) to all of the items on the consequences and self-inferences subscales, the skewed distributions on those two subscales will detract from whatever useful information is being provided by the causes/attributional style subscale in the CCSQ total score.

CONDITIONAL PROCESS ANALYSIS

Because the results of the primary hypotheses in this study did not produce detailed information about potential developmental differences between younger children and older children in their cognitive vulnerabilities to depression, a secondary set of analyses was conducted using a different, developmentally-sensitive approach. For the secondary analyses, the simple mediational models tested in hypotheses 1 through 4 were rerun, this time adding “grade in school” into the model as a potential moderator of all three paths in the simple mediation model. As can be seen in Figure 21, the conceptual depiction of the conditional process (i.e. moderated mediation) model tested, in these secondary analyses, “grade in school” was conceptualized as a potential moderator of the *a* path, the *b* path, and the *c*’ path.

This type of moderated mediation, also known as conditional process analysis, is useful for exploring the conditions under which one variable exerts its effect on another. Specifically, these secondary analyses sought to explore whether the indirect effect of negative life events on depressive symptoms through the cognitive mediator tested in each hypothesis was as significant (or not significant) to the same degree and in the same direction for children in the younger grades as it was for children in the older grades. A statistical diagram of the conceptual model tested can be seen in Figure 22.

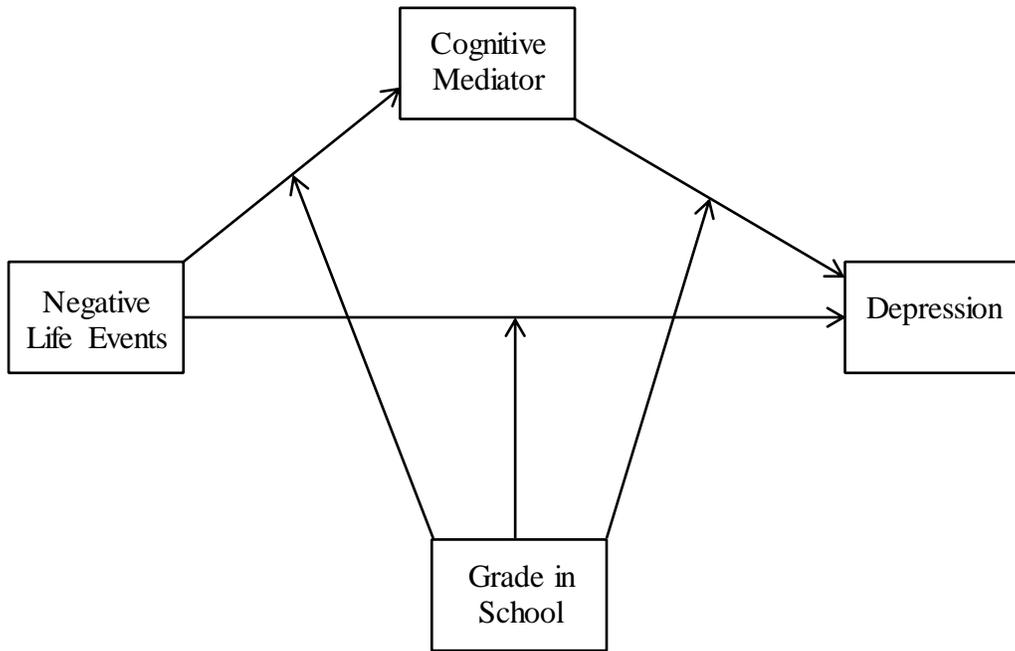


Figure 21. Conceptual Diagram of the Conditional Process Model

Grade in school, as a proxy for cognitive development, was entered into the simple meditational model tested in Hypotheses 1 through 4. Specifically, this model envisioned grade as a potential moderator of all three paths in the meditational model.

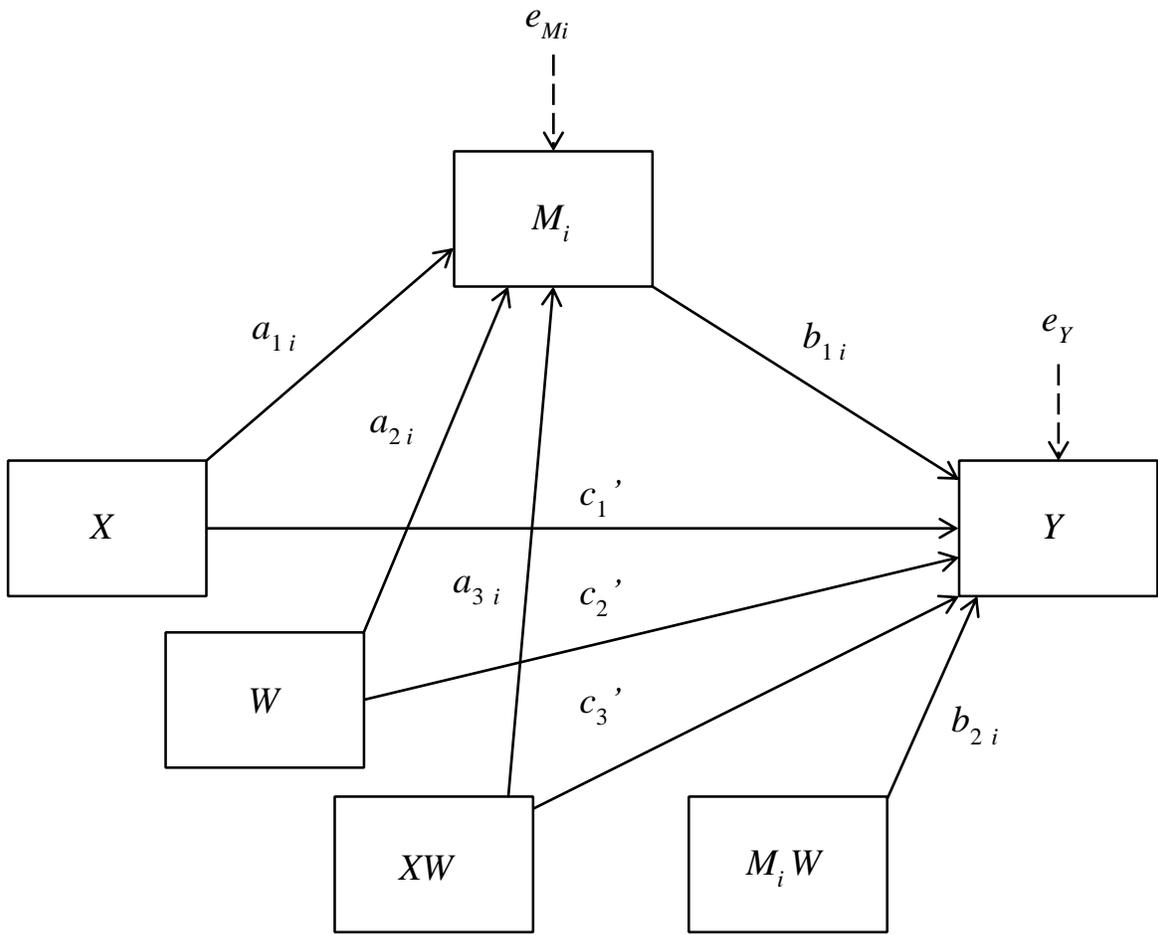


Figure 22 Statistical Diagram of the Conditional Process Model Tested

Tables and diagrams of results for each hypothesis retested can be seen below. A general discussion of the findings from these conditional process (moderated mediation) secondary analyses can be found below and in Chapter 5.

For both tests of Beck's model (i.e. cognitive triad total score as the mediator as in Hypothesis 1 or cognitive triad weakest link score as the mediator as in Hypothesis 2), indirect effects of life events on depression through the cognitive triad were significant and positive across all grade levels. Figure 23 shows the paths tested for Beck's model when grade in school was added to the model. Results in Table 11 are for Beck's model when the CTI-C total score was the mediator; results in Table 12 are for Beck's model using the CTI-C weakest link score as the mediator. For all grades, a higher number and magnitude of "effect on self" of negative life events and a more depressotypic cognitive triad were associated with greater levels of depressive symptoms. Additionally, the size of the coefficient increased as grade in school increased.

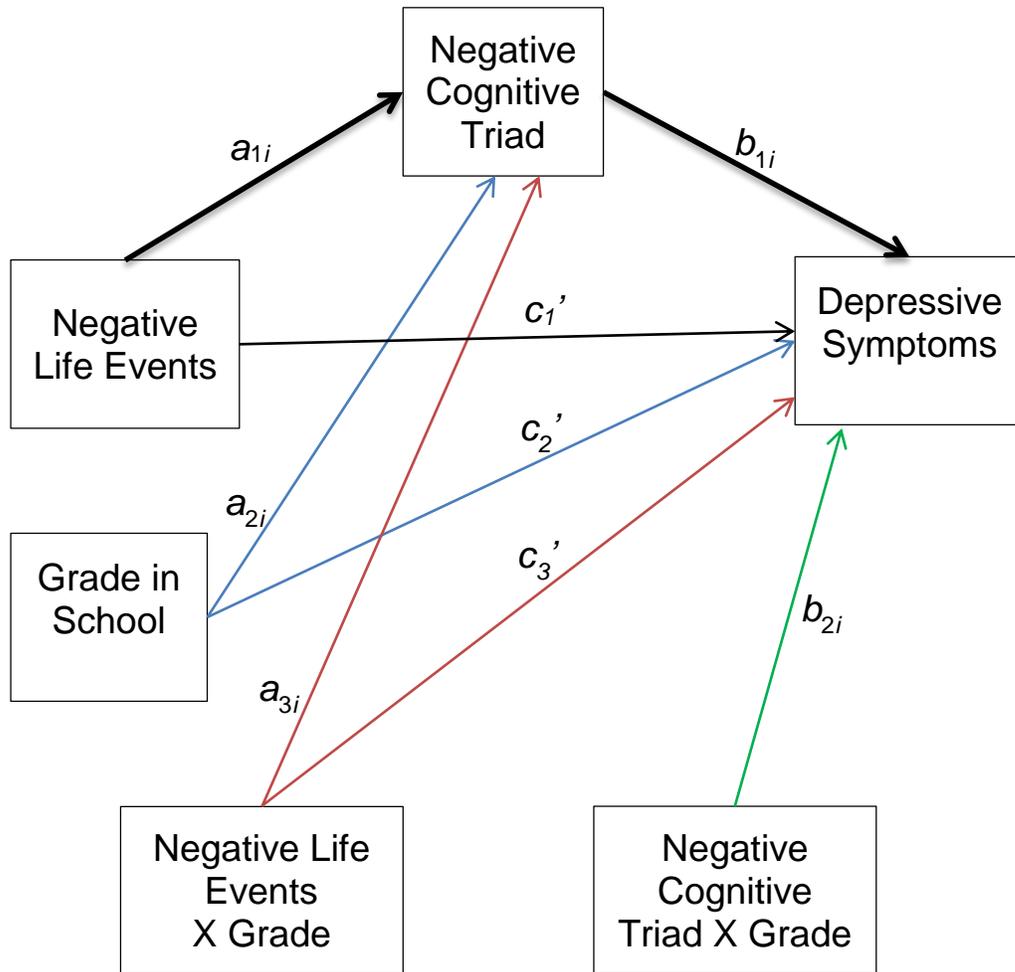


Figure 23 Conditional Process Model for Beck's Cognitive Triad

Table 15 CTI-C Total Score Secondary Analyses

Coefficients for the Conditional Process Model in Figure 23 using CTI-C Total Score

<i>W</i>	Indirect	95% Bias-Corrected Bootstrap CI	Direct	<i>se</i> _{$\theta_{X \rightarrow Y}$}	<i>p</i>
	<u>Effect</u>		<u>Effect</u>		
	ω		$\theta_{X \rightarrow Y}$		
-1.12 (4.40 before centering)	0.09 (0.05)	[0.02, 0.22]	0.24	0.10	0.02*
0 (5.52 before centering)	0.17 (0.06)	[0.07, 0.29]	0.03	0.08	0.68
1.12 (6.63 before centering)	0.25 (0.12)	[0.06, 0.51]	-0.17	0.14	0.21

Note. Negative Life Events, CTI-C Total Score, and Grade were mean centered prior to the analysis. Values of the moderator *W* are mean grade in school (5.52 before centering), one SD below the mean (grade 4.40), and one SD above the mean (grade 6.63). The conditional indirect effect of negative life events on depression through the CTI-C total score at various levels of the moderator is $\omega = (a_1 + a_3W)(b_1 + b_2W)$. The conditional direct effect of negative life events on depression, when CTI-C scores are held constant, at various levels of the moderator is $\theta_{X \rightarrow Y} = c'_1 + c'_3W$. Bias corrected bootstrap confidence intervals are based on 5,000 bootstrap resamples. All standard errors are based on the heteroscedasticity-consistent HC3 estimator.

* $p < .05$

Table 16 CTI-C Weakest Link Secondary Analysis

Coefficients for Conditional Process Model in Figure 23 using CTI-C Weakest Link

<i>W</i>	<u>Indirect</u>	95% Bias-Corrected Bootstrap CI	<u>Direct</u>	<i>se</i> $\theta_{X \rightarrow Y}$	<i>p</i>
	<u>Effect</u>		<u>Effect</u>		
	ω		$\theta_{X \rightarrow Y}$		
-1.12 (4.40 before centering)	0.09 (0.05)	[0.01, 0.20]	0.25	0.11	0.02*
0 (5.52 before centering)	0.14 (0.05)	[0.05, 0.25]	0.07	0.09	0.43
1.12 (6.63 before centering)	0.20 (0.10)	[0.03, 0.43]	-0.11	0.14	0.43

Note. Negative Life Events, CTI-C Weakest Link, and Grade were mean centered prior to the analysis. Values of the moderator *W* are mean grade in school (5.52 before centering), one SD below the mean (grade 4.40), and one SD above the mean (grade 6.63). The conditional indirect effect of negative life events on depression through the CTI-C score at various levels of the moderator is $\omega = (a_1 + a_3W)(b_1 + b_2W)$. The conditional direct effect of negative life events on depression, when CTI-C scores are held constant, at various levels of the moderator is $\theta_{X \rightarrow Y} = c'_1 + c'_3W$. Bias corrected bootstrap confidence intervals are based on 5,000 bootstrap resamples. All standard errors are based on the heteroscedasticity-consistent HC3 estimator.

* $p < .05$

Figure 24 shows the conditional process model using Abramson's cognitive inferential style as the mediator and grade in school as the moderator of the mediated paths. The same pattern of significant conditional indirect effects in Beck's model was seen when retesting Hypothesis 3 with the total score of Abramson's cognitive inferential style as the cognitive mediator between negative life events and depressive symptoms: a higher number and magnitude of negative life events and a more negative cognitive style were associated with greater levels of depression across all grade levels. This can be seen in Table 13. As with Beck's model, the size of the coefficient increased as grade in school increased.

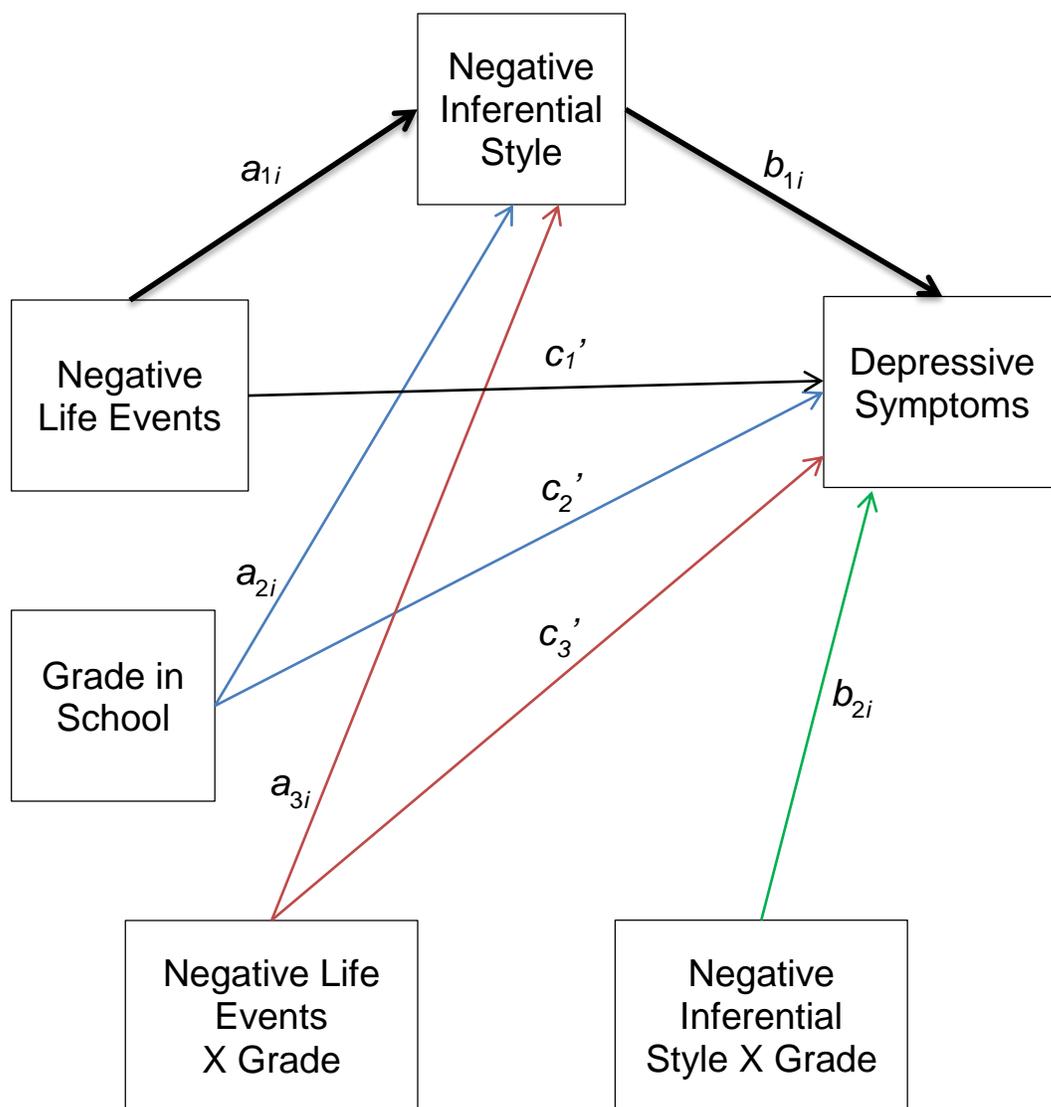


Figure 24 Conditional Process Model for Abramson's Inferential Style

Table 17 CCSQ Total Score Secondary Analysis

Coefficients for the Conditional Process Model in Figure 24

<i>W</i>	Indirect	95% Bias-Corrected Bootstrap CI	Direct	$se_{\theta_{X \rightarrow Y}}$	<i>p</i>
	<u>Effect</u>		<u>Effect</u>		
	ω		$\theta_{X \rightarrow Y}$		
-1.12 (4.40 before centering)	0.04 (0.03)	[0.00, 0.14]	0.30	0.12	0.01*
0 (5.52 before centering)	0.08 (0.03)	[0.02, 0.16]	0.13	0.10	0.18
1.12 (6.63 before centering)	0.11 (0.07)	[0.01, 0.28]	-0.03	0.16	0.83

Note. Negative Life Events, CCSQ Total Score, and Grade were mean centered; CCSQ Total Score was inverse transformed. Values of the moderator *W* are mean grade (5.52 before centering), one SD below the mean (grade 4.40), and one SD above the mean (grade 6.63). The conditional indirect effect of negative life events on depression through the CCSQ score at various levels of the moderator is $\omega = (a_1 + a_3W)(b_1 + b_2W)$. The conditional direct effect of negative life events on depression, when CCSQ scores are held constant, at various levels of the moderator is $\theta_{X \rightarrow Y} = c'_1 + c'_3W$. Bias corrected bootstrap confidence intervals are based on 5,000 bootstrap resamples. All standard errors are based on the heteroscedasticity-consistent HC3 estimator.

* $p < .05$

Interestingly, when retesting Hypothesis 4, which had a measure of Abramson's negative cognitive style, calculated using the "weakest link" method, the indirect effect through the mediator was significant for 5th graders and 6th graders, but was not significant for 4th graders. This result is somewhat perplexing because the weakest link method was conceived of as a way of detecting significant indirect effects in younger grades that would not ordinarily be detectable using the traditional, additive (i.e. total scale score) method of calculating the cognitive vulnerability factor. In this particular sample, the findings were the exact opposite of what would have been expected for the children in the lower grades. It was expected that effects through a cognitive mediator would be significant for 4th graders when using the weakest link method and not significant when using the traditional, additive method. Instead, the reverse was found when testing Abramson's model. These results can be seen in Table 14.

Table 18 Coefficients for the Conditional Process Model in Figure 24

<i>W</i>	Indirect	95% Bias-Corrected Bootstrap CI	Direct	<i>se</i> _{$\theta_{X \rightarrow Y}$}	<i>p</i>
	<u>Effect</u>		<u>Effect</u>		
	ω		$\theta_{X \rightarrow Y}$		
-1.12 (4.40 before centering)	0.03 (0.03)	[-0.01, 0.10]	0.31	0.11	0.01*
0 (5.52 before centering)	0.06 (0.03)	[0.01, 0.14]	0.14	0.10	0.16
1.12 (6.63 before centering)	0.11 (0.07)	[0.00, 0.28]	-0.03	0.17	0.87

Note. Negative Life Events, CCSQ Weakest Link, and Grade were mean centered prior to the analysis. Values of the moderator *W* are mean grade in school (5.52 before centering), one SD below the mean (grade 4.40), and one SD above the mean (grade 6.63). The conditional indirect effect of negative life events on depression through the CCSQ score at various levels of the moderator is $\omega = (a_1 + a_3W)(b_1 + b_2W)$. The conditional direct effect of negative life events on depression, when CCSQ scores are held constant, at various levels of the moderator is $\theta_{X \rightarrow Y} = c'_1 + c'_3W$. Bias corrected bootstrap confidence intervals are based on 5,000 bootstrap resamples. All standard errors are based on the heteroscedasticity-consistent HC3 estimator.

* $p < .05$

CHAPTER 5: DISCUSSION

OVERVIEW OF FINDINGS

Direct Effects of Stressful Life Events on Depression

Overall, the results of this study provide support for cognitive vulnerability-stress models of depression in general. In all of the models tested, there was a significant total effect of negative life events on K-SADS total depression scores. In other words, a greater number and magnitude of negative life events was associated with higher levels of depressive symptoms.

Indirect Effects of Stressful Life Events on Depression

When a measure of cognitive vulnerability was added to the model as a potential mediator, there was a significant indirect effect of negative life events on depressive symptoms, through the cognitive mediator. This indirect effect through the cognitive mediator was significantly larger than any remaining direct effect from negative life events to depression. As can be seen with the results for Hypotheses 1 through 4, this general finding held no matter which measure of cognitive vulnerability was used when testing a simple mediational model. These findings appear to support both Beck's theory and Abramson's theory.

Hypothesis 1

There was a significant indirect effect of negative life events on K-SADS depression scores when total scores on the Children's Cognitive Triad Inventory (CTI-C) were entered into the model as a mediator. This finding supports Beck's theory, that the way one interprets the experience of negative life events has an impact upon depressive symptoms; the selective cognitive processing of a child with a negative view of the self,

world, and future will lead her to experience a greater level of depressive symptoms after experiencing negative life events.

Hypothesis 2

When using the weakest link method to test Beck's theory (i.e. substituting a child's single most depressotypic subscale score on the Children's Cognitive Triad Inventory (CTI-C) for the CTI-C total score), there was also a significant indirect effect of negative life events on depressive symptoms through the cognitive mediator. However, using the "Weakest Link" method does not appear to provide any benefit over using the additive method; the paths that are significant using the weakest link method are the same paths that are significant using the CTI-C total score to calculate the mediator.

Hypothesis 3

There was a significant indirect effect of negative life events on K-SADS depression scores, when total scores on the Children's Cognitive Style Questionnaire (CCSQ) were entered into the model as a mediator. This supports Abramson's theory that a child with a negative cognitive style will tend to make depressogenic inferences about herself in reaction to negative life events and about the causes and potential consequences of negative life events, which will then lead her to experience a greater level of depressive symptoms.

Hypothesis 4

When using the weakest link method to test Abramson's theory (i.e. substituting a child's single, most depressive subscale score on the Children's Cognitive Style Questionnaire (CCSQ) for her total score on the CCSQ), there was also a significant indirect effect of negative life events on depressive symptoms, when a single negative cognitive style was entered into the model as a mediator. These results, using the weakest

link method, are similar to the results found using the additive method to calculate the CCSQ in Hypothesis 3. The only difference between the two methods is that when using the weakest link as the mediator, the direct effect between negative life events and depressive symptoms continued to be barely significant ($p = .049$). However, it is possible that a replication of this study with a slightly different sample would result in the direct effects no longer being significant (i.e. $p > .05$).

Exploratory Analyses of Weakest Link Categories by Grade in School

Hypothesis 5

An exploratory chi square analysis of the relationship between category of weakest link subscale on the Cognitive Triad Inventory for Children (CTI-C) and grade in school could not be conducted as expected because nearly a fifth of the sample ($n = 39$) had the same score on multiple subscales of the CTI-C and thus could not be categorized as having a specific weakest link subscale. To address this problem, these children were grouped together as having “more than one category” as their weakest link. The chi square analysis did not reveal a significant association between category of weakest link on the CTI-C and grade in school. However, a graphical depiction of category of weakest link subscale by grade level suggests a possible increase in the proportion of children who experience a “Negative View of the World” as their weakest link of the cognitive triad between grades 4 and 7. This trend, which has been found in the limited prior research in this area, suggests that potential developmental differences in the structure of the cognitive triad should be examined in future research.

Hypothesis 6

As with Hypothesis 5, an exploratory chi square analysis of the relationship between category of weakest link subscale on the Children’s Cognitive Style

Questionnaire (CCSQ) and grade in school was problematic because not all of the children in the sample fit into a single category of weakest link subscale on the CCSQ. These children were also grouped together as having “more than one category” of weakest link for the chi square analysis. The results of the chi square test suggest that there is not an association between grade in school and category of weakest link. However, it should be noted that 76.3% of the entire sample (fairly evenly split across all grade levels) experienced a negative attributional style (i.e. the causes subscale of the CCSQ) as their weakest link. This could suggest the lack of developmental differences in the structure of the CCSQ, which would be contrary to the findings from the small body of prior research in this area, but it also could suggest the need to examine the structure of the measure itself. For example, the attributional style causes subscale of the CCSQ contains 12 items, while the consequences and self-inferences subscales each contain only 4 items. Each subscale is calculated using the mean of its items; therefore the range of possible scores is still the same for each subscale. However, it is possible that a subscale containing only 4, similarly-worded items cannot validly assess all facets of the construct it is intended to assess.

Overview Tables of Results

Since the purpose of this study was to compare different cognitive mediators, by retesting the exact same model multiple times and substituting in a different cognitive mediator for each analysis, a cursory summary of the findings for each set of analyses is combined in Table 15. Note that across all models tested, there was a significant total effect (*c* path) of life events on depression ($b = .226, p < .05$). * $p < .05$

Table 19. Overview of Findings for all Four Simple Mediation Models Tested

	<i>Effect of Life Events on Mediator</i>	<i>Effect of Mediator on Depression</i>	<i>Indirect Effect of Life Events on Depression through Mediator</i>	<i>Direct Effect of Life Events on Depression</i>
Cognitive Mediator	<i>a path</i>	<i>b path</i>	<i>ab path</i>	<i>c' path</i>
H1: Cognitive triad total score	.401*	.390*	.153*	<i>Not Significant</i>
H2: Cognitive triad weakest link score	.135*	.948*	.128*	<i>Not Significant</i>
H3: Cognitive inferential style total score	-.004*	-19.633*	.073*	<i>Not Significant</i>
H4: Cognitive inferential style weakest link score	.013*	4.145*	.055*	.172*

A general overview of findings for the secondary analyses (in which grade in school was entered into the model to assess potential developmental differences) is shown in Table 16, in order to show contrasts among the four models tested by grade in school. This table is meant to provide a visual summary of which cognitive models of depression were significant and which were not significant for children at various grades in school. In this study, the moderator of the meditational model was grade in school. The participants in this sample were in grades 4 through 7. As can be seen in the summary tables, results of the meditational model are presented separately for study participants one standard deviation below the mean grade in school (i.e. grade 4.4), at the mean (i.e. grade 5.5) and one standard deviation above the mean (i.e. grade 6.6). (Note that Cognitive Inferential Style Total Score was tested using an inverse transformation of CCSQ total scores to correct for the skewed distribution. Also, the Cognitive Triad Inventory for Children (CTI-C) was rescored for this study so that higher scores indicate a more negative/depressotypic cognitive triad.)

Table 20. Overview of Findings by Grade for All Four Models Tested

Conditional <i>Indirect</i> Effect of Negative Events on Depression			
Cognitive Mediator	4 th Graders	5 th Graders	6 th Graders
H1: Cognitive triad total score	.095	.166	.255
H2: Cognitive triad weakest link score	.085	.136	.196
H3: Cognitive inferential style total score	.044	.075	.108
H4: Cognitive inferential style weakest link score	<i>Not Significant</i>	.065	.115
Conditional <i>Direct</i> Effect of Negative Events on Depression			
	4 th Graders	5 th Graders	6 th Graders
H1: Beck's model- traditional	.239	<i>Not Significant</i>	<i>Not Significant</i>
H2: Beck's model- weakest link	.247	<i>Not Significant</i>	<i>Not Significant</i>
H3: Abramson's model- traditional	.296	<i>Not Significant</i>	<i>Not Significant</i>
H4: Abramson's model- weakest link	.311	<i>Not Significant</i>	<i>Not Significant</i>

SUMMARY AND INTEGRATION WITH PREVIOUS RESEARCH

This study used mediation analysis to evaluate Beck's model and Abramson's model in a sample of 198 girls, in the 4th through 7th grades. Data from diagnostic interviews were used to create a continuous measure of depressive symptoms. Self-report measures, including the Life Events Checklist, the Cognitive Triad Inventory for Children, and the Children's Cognitive Style Questionnaire, were used to assess perceptions of negative life events, Beck's cognitive triad, and Abramson's cognitive inferential style, respectively. Results of separate mediation analyses supported both Beck's and Abramson's theories. There was a significant indirect effect of life events through Beck's cognitive triad on symptoms of depression. Similarly, there was a significant indirect effect of life events through Abramson's negative cognitive inferential style on depressive symptoms. Higher depressive symptoms were associated with a more depressotypic cognitive triad, a more depressotypic cognitive inferential style, and a greater number and greater magnitude of negative life events. These results provide support for cognitive vulnerability-stress models of depression in general and appear to support both Beck's theory of depression and Abramson's theory of depression in this sample of early adolescent girls.

The models were then retested using a more developmentally-sensitive method, the weakest link approach, to account for potential cognitive differences between 4th graders and 7th graders in the sample. The weakest link approach, which calls for replacing a participant's total scale score on a measure of a cognitive mediator with her most depressotypic subscale, provided similar results to those achieved using the total scale scores. That is to say that when a cognitive mediator was entered into the model, there were significant indirect effects of negative life events on depressive symptoms that were accounted for by the cognitive mediator and any remaining direct effects of life

events on depressive symptoms were no longer significant. These results held whether using a total scale score of Beck's cognitive triad, a total scale score of Abramson's cognitive style, or a weakest link subscale score of Beck's cognitive triad as the cognitive diathesis in the mediational model.

The only exception to this result was with Abramson's cognitive style score when it was calculated using the weakest link approach; in that instance, direct effects of life events on depression remained barely significant ($p = .049$) after the mediator was entered into the model. Overall, however, the weakest link approach did not significantly change the results of the analyses and did not appear to provide significant benefit over traditional, additive methods of calculating a cognitive mediator.

The weakest link approach not only failed to provide significantly different results from those achieved using the total scale score, but also did not provide any extra information about differences in cognitive vulnerability among different age participants. Because the weakest link approach is based on the premise that different facets of a cognitive vulnerability factor emerge separately at different points during a child's cognitive development, two exploratory chi-square analyses of association were conducted to see if there was an association between grade in school (as a proxy for cognitive development) and weakest link subscale category of a measure of cognitive vulnerability.

One chi-square analysis examined the relationship between grade in school and subscale of the Children's Cognitive Triad Inventory (CTI-C) to see if one facet of Beck's cognitive triad (i.e. a negative view of the self, the world, or the future) was the weakest link more frequently for younger children than for older children. The chi-square analysis did not find significant associations between category of weakest link on Beck's triad and grade in school. In other words, category of CTI-C weakest link was fairly,

evenly distributed among 4th, 5th, 6th, and 7th graders. However, a visual examination of a bar graph of counts in each category per grade level suggests a possible trend of an increasing proportion of students in higher grades with “view of the world” as their weakest link. Although the results were not significant in this sample, future studies should explore the possibility that view of the world might be more a more salient cognitive vulnerability for 6th and 7th graders than it is for younger children.

The second chi-square analysis examined the categorical relationship between grade in school and subscale of the Children’s Cognitive Style Questionnaire (CCSQ) to see if one facet of Abramson’s cognitive inferential style (i.e. the tendency to make negative inferences about the causes of negative life events, the consequences of negative life events, or the self in the context of negative life events) was the weakest link more frequently for younger children than for older children. As with the first chi-square analysis (examining the facets of Beck’s triad), there were no significant associations between grade in school and weakest link subscale on the CCSQ.

However, 76.3% of the entire sample (across all grade levels) had the “causes”/ attributional style subscale as their weakest link. This result could suggest that attributional style is the most salient cognitive vulnerability of Abramson’s inferential styles for 4th, 5th, 6th, and 7th graders and that the other two facets of Abramson’s cognitive inferential style (i.e. inferences about the consequences of negative life events and the self in the context of negative life events) do not become significant vulnerabilities until sometime beyond the 7th grade. Alternatively, this result could also suggest some issues with the structure of the Children’s Cognitive Style Questionnaire (CCSQ) and a need to reexamine its psychometric properties across a larger age range of children.

Although the focus of this study has been primarily on a vulnerability-stress model of depression and the indirect effects of negative life events on depression through a cognitive mediator, the developmental hypothesis also makes predictions about the direct effects of negative life events on depression. Specifically, it states that in younger, less cognitively mature children, before cognitive patterns have developed into stable traits, depressive symptoms may simply be the direct result of stressful life events. The results of the secondary analyses in this study, which added grade in school in to the mediational models as a potential moderator of the mediation paths, provide some support for this developmental hypothesis. Indeed, the clearest developmental pattern across all of the hypotheses tested can be seen in the table of conditional direct effects of negative events on depression at various levels of the moderator. Regardless of which cognitive mediator was in the model (i.e. Beck's triad calculated in the traditional method or the weakest link method or Abramson's cognitive style calculated in the traditional method or the weakest link method), there were still significant direct effects of negative life events on depression remaining in every case for the 4th graders in the sample, but not for the 5th, 6th, and, 7th graders.

Integration with Previous Research

There were two primary goals for this study. First, the weakest link approach was compared to the traditional, additive approach for calculating a cognitive mediator to test in vulnerability-stress models of depression in children. It was expected that for the youngest children in the study, without fully-developed depressotypic cognitive styles, there would not be a significant indirect effect of negative life events on depression through a cognitive mediator when the questionnaire representing the multi-faceted

cognitive mediator was scored using the total scale, additive approach. However, the weakest link approach, which calls for replacing a child's total score on a measure of a cognitive mediator with her score on a single subscale (whichever is most depressotypic) was expected to identify significant indirect effects of negative life events on depression through a cognitive mediator in those younger children.

Second, two cognitive vulnerability-stress models of depression were compared to see if one did a better job of explaining depression in children than the other. Both models were tested using the same sample of girls in the 4th through 7th grades, with same independent variable (i.e. sum of perceived "effects on self" of negative life events experienced in the prior year) and the same dependent variable (i.e. a continuous measure of depressive symptoms experienced in the last week, created from a semi-structured diagnostic K-SADS interview.) Both models were tested as mediational models.

The Weakest Link Approach

The Weakest Link approach did not appear to provide any benefit over the traditional additive approach of calculating a cognitive diathesis in this study. As a test of Beck's theory, the total scale score (i.e. the additive approach) on the Children's Cognitive Triad Inventory (CTI-C) was found to be a significant mediator of the relationship between negative life events and depression. When the model was retested using the weakest link score on the Children's Cognitive Triad Inventory instead of the total score, it was also a significant mediator of the relationship between negative life events and depression. The same paths that were significant in the mediational model when the CTI-C total score was used were also significant when the weakest link score was used.

Similarly, as a test of Abramson's model, the total scale score (i.e. additive approach) on the Children's Cognitive Style Questionnaire (CCSQ) was found to be a significant mediator of the relationship between negative life events and depression. When the model was retested using the weakest link score on the Children's Cognitive Style Questionnaire instead of the total score, it was also a significant mediator of the relationship between negative life events and depression. The only difference in the findings was that when the weakest link score from a measure of Abramson's cognitive style was used and significant *indirect* effects through the weakest link mediator were found, the *direct* effects of negative life events on depression (i.e. not through the mediator) continued to be significant, as well. (This finding is in contrast to the other three models—(1) testing Beck's triad total score, (2) Beck's triad weakest link score and (3) Abramson's cognitive inferential style total score separately as mediators—where direct effects between stressful events and depression ceased to be significant when the mediator was entered into the model; the only significant effects in those three models were the indirect effects through the cognitive mediator).

These findings are somewhat paradoxical because they achieve results that were counter to what the "weakest link" approach was intended to achieve. It was expected that in a sample with younger children, at an earlier stage of cognitive development, indirect (meditational) effects through the cognitive style total score would not be significant and that it would be necessary to use the weakest link calculation of the cognitive style score in order to be able to detect a significant indirect (meditational) effect. In other words, there would not be support for Abramson's vulnerability-stress model of depression in a sample that contained children because the three facets of Abramson's cognitive inferential style (i.e. the tendency to make negative self-inferences, attributional/causal inferences, and inferences about the consequences of negative life

events) would not all be fully formed and functional at an early age. Instead, it was expected that the weakest link method, which calls for using a score representing just one of the three facets of Abramson's cognitive style (whichever one is most depressotypic/negative for each child), would be necessary in order to detect significant indirect effects through the cognitive mediator and find support for Abramson's model.

It is possible that in the current sample, all of the participants had reached a high enough level of cognitive maturity that the weakest link method was not necessary, but that the weakest link method might have been necessary with a younger sample. Indeed, the clearest support for the idea that the facets of a negative cognitive style develop separately as a child matures has been found in studies that included children as young as second grade; whereas, the youngest participants in this sample were in the fourth grade. At the moment, there is not enough of a research base to pinpoint at what age or level of cognitive development the different facets of a negative cognitive style might emerge and crystalize into a cohesive, potent risk factor for depression. However, the current push in the research community for more prospective, longitudinal studies that follow children starting at a very young age in order to better understand the etiology of depression could help expand the knowledge base in this area.

It is also possible, however, that the weakest link approach may not be the most effective method for uncovering and understanding the effects of emerging depressotypic cognitive styles in developing children. From a statistical perspective, the weakest link approach sounds similar to McClelland and Judd's (1993) "extreme groups" approach of oversampling extreme groups at the expense of central scores, which has been critiqued in recent years for manipulating the data beyond what one would find in nature in order to maximize power artificially for detecting significant effects (Preacher & Kelley, 2011). Although the extreme being selected in the weakest link approach is only in one direction

(i.e. the most depressotypic subscale score on a measure), it could be seen as cherry picking from the data and could lead to conclusions about significance and effect size that are not generalizable to the real world.

There is also some murkiness in the literature as to whether the weakest link approach is a method or a hypothesis. In all likelihood, it is probably best described as a technique for handling data that is based on a premise that has received some support, but has not been fully tested. When it is described as a hypothesis, the weakest link approach suggests that certain facets of Abramson's negative cognitive style, such as the tendency to make negative self-inferences, emerge at earlier times in a child's cognitive development than the other two facets of a negative cognitive style. This hypothesis, which has received some support in recent years, could not be directly tested with the analytic methods used in this study. This hypothesis should be explored in future studies.

Comparison of Beck's Model and Abramson's Model

One of the purposes of this study was to compare Abramson's cognitive model of depression with Beck's cognitive model of depression to see if they both do an equally good job of explaining depression in children. Both models are cognitive vulnerability-stress models of depression. However, it was expected that the cognitive vulnerability factor in Abramson's model (i.e. negative cognitive self-inferential style) would require a greater level of cognitive maturity to function as a stable diathesis for depression than Beck's negative cognitive triad would. Therefore, it was expected that significant support for Beck's model, but not for Abramson's model, would be found amongst the youngest participants in this study.

In this study, tests of Beck's model and Abramson's model were both significant for children at all grade levels. Whether using the Children's Cognitive Triad Inventory

(CTI-C) to test Beck's model or using the Children's Cognitive Style Questionnaire (CCSQ) to test Abramson's model, there was a significant indirect effect of negative life events on depressive symptoms through the cognitive mediator. It appears that either Beck's negative cognitive triad or Abramson's negative cognitive style can function as cognitive vulnerabilities to depression in 4th through 7th graders. (This study found support for both constructs separately, but they were never tested simultaneously as mediators in the same model, due to some conceptual overlap between the two constructs.) The question then becomes how to compare and contrast the results found with each model.

Since both models were found to be significant, one way to compare them is to look at the size of the effect that was achieved when testing each model. Indeed, there has been a push in recent years to get researchers to move beyond simply testing for statistical significance and to report effect sizes. Table 17 shows effect sizes for Hypotheses 1-4 using several popular metrics that have been used in the literature. It should be noted, however, that the quantification of effect size in mediation analysis is an evolving area of research with newer methods, such as Preacher & Kelley's (2011) kappa-squared, seen as more trustworthy descriptors of indirect effect size than some of their less-stable predecessors (Hayes, 2013).

With exception of Preacher and Kelley's (2011) kappa-squared, most of the indices of indirect effect size in Table 17 can be interpreted relative to zero, with numbers closer to zero indicating smaller effect sizes and numbers further away from zero indicating larger effect sizes. As can be seen in Table 17, for all of these indices, the effect sizes were larger when Beck's cognitive triad was tested as the mediator in the model (hypotheses 1 and 2) than when Abramson's negative cognitive style was the mediator (in hypotheses 3 and 4).

In contrast, Preacher and Kelley's (2011) kappa-squared is a ratio of the indirect effect size relative to its largest possible value in the data given constraints on its magnitude due to variances and correlations between observed variables. The values of kappa-squared can range from 0 to 1, with numbers closer to 1 indicating a larger indirect effect. As can be seen in Table 13, when Beck's cognitive triad was tested as a mediator between negative life events and depression, kappa-squared was .126 when the CTI-C total score was used (in hypotheses 1) and .103 when the CTI-C weakest link total score was used (in hypothesis 2). This means that the indirect effect through the CTI-C total score accounted for about 13% of its maximum possible value, whereas the indirect effect through the CTI-C weakest link score accounted for about 10% of its maximum possible value.

When Abramson's negative cognitive inferential style was tested as a mediator between negative life events and depression, kappa-squared was .058 when the Children's Cognitive Style Questionnaire (CCSQ) total score was used (in hypothesis 3) and .042 when the CCSQ weakest link score was used (in hypothesis 4). This means that the indirect (meditational) effect through the CCSQ total score accounted for about 6% of its maximum possible value, whereas the meditational effect through the CCSQ weakest link score accounted for about 4 percent of its maximum possible value.

Because kappa-squared has similar properties as r-squared, Preacher and Kelley (2011) suggest that the confidence intervals for kappa-squared could be interpreted using Cohen's (1988) benchmarks for effect size, .01, .09, and .25, which are considered small, medium, and large effect sizes, respectively. Using Cohen's benchmarks, then, the indirect effect of negative life events on depression through Abramson's negative cognitive inferential style would be considered "small" when it was represented by the CCSQ weakest link score (in hypothesis 4) and "medium" when it was represented by the

CCSQ total score (in hypothesis 3). Similarly, the indirect effects of negative life events on depression through Beck's negative cognitive triad would be considered "medium" when represented by the CTI-C "weakest link" score (in hypothesis 2) and "medium" when represented by the CTI-C total score (in hypothesis 1).

Overall, the indices of effect size in Table 17 suggest that the indirect effect of negative life events on depression through a cognitive mediator were slightly larger for the two hypotheses testing Beck's model (hypothesis 1 and 2) than for the hypotheses testing Abramson's model (hypothesis 3 and 4), but there did not appear to be significant differences between the two models. However, a note of caution is in order because effect sizes do not connote clinical significance or practical importance. For example, in the field of prevention research in developmental psychopathology, it is possible that smaller effect sizes may be of greater practical importance than in other fields. If the goal is to identify children with emerging negative thought processes and to provide them with cognitive interventions before those negative thought processes become entrenched traits, then small effect sizes should not be overlooked.

Table 21. Effect Size Comparisons of Beck's & Abramson's Models

	Cognitive Mediator Tested	Effect	Boot S.E.	Bootstrap C.I.
Indirect Effect of X on Y				
H1:	CTI-C Total	.156	.050	.069-.264
H2:	CTI-C Weakest Link	.128	.047	.048-.233
H3:	CCSQ Total	.073	.032	.023-.155
H4:	CCSQ Weakest Link	.053	.030	.006-.123
Partially Standardized Indirect Effect of X on Y				
H1:	CTI-C Total	.013	.004	.006-.022
H2:	CTI-C Weakest Link	.011	.004	.004-.019
H3:	CCSQ Total	.006	.003	.002-.013
H4:	CCSQ Weakest Link	.004	.002	.000-.010
Completely Standardized Indirect Effect of X on Y				
H1:	CTI-C Total	.123	.038	.057-.207
H2:	CTI-C Weakest Link	.101	.036	.039-.181
H3:	CCSQ Total	.058	.024	.018-.117
H4:	CCSQ Weakest Link	.042	.023	.005-.094
Ratio of Indirect to Total Effect of X on Y				
H1:	CTI-C Total	.692	1.82	.318-1.86
H2:	CTI-C Weakest Link	.568	.990	.216-1.53
H3:	CCSQ Total	.324	6.23	.089-1.33
H4:	CCSQ Weakest Link	.235	1.02	.018-1.12
R-squared Mediation Effect Size				
H1:	CTI-C Total	.029	.019	.002-.078
H2:	CTI-C Weakest Link	.026	.017	.003-.071
H3:	CCSQ Total	.018	.011	.003-.048
H4:	CCSQ Weakest Link	.014	.009	.002-.041
Preacher & Kelley's Kappa-squared				
H1:	CTI-C Total	.126	.037	.060-.205
H2:	CTI-C Weakest Link	.103	.035	.040-.178
H3:	CCSQ Total	.058	.024	.018-.116
H4:	CCSQ Weakest Link	.042	.022	.007-.094

LIMITATIONS

Several limitations need to be considered when assessing the results of this study. First, the study used cross-sectional data; so it is not possible to make conclusions about causality. Significant relationships were found among the key constructs in this study—stressful life events, depressive symptoms, a negative cognitive inferential style, and a negative cognitive triad—but it cannot be concluded definitively whether depressive symptoms are a result of or a catalyst for developing a negative cognitive outlook on the world. This is a limitation of this study, but not one that necessarily needs to be resolved definitively. After all, several theorists, including Beck, describe the interplay of depressive symptoms and negative cognitions as a recursive process, wherein an increase in one leads to an increase in the other, which in turns leads to an increase in the other one, et cetera.

A second limitation is that all of the participants in this study were girls. This was a deliberate aspect of the design of the original study from which these data were taken, because the difference in rates of depression between females and males doubles during the transition into and through adolescence. It is, therefore, important that studies pinpoint why this troubling trend happens for preadolescent and adolescent girls. However, in childhood, the rates of depression are roughly equal between boys and girls and there is a steady, albeit smaller, percentage of the male population who experience depression in adolescence and/or adulthood. Future studies that include boys are needed because it is not known whether results of studies of depression in girls can be generalized to depression in boys.

SUMMARY

Cognitive theories of depression share the same overall hypothesis that the way one interprets stressful life events contributes to depression. What distinguishes one theory from another is the specific cognitive vulnerability factor hypothesized to predispose an individual to depression after a negative event. Abramson's hopelessness theory uses a negative cognitive inferential style and Beck's theory uses a negative cognitive triad of views about the self, world, and future. Both theories have been supported in studies of adults; however, research results with children have been mixed. One explanation for mixed results is that downward extensions of adult models have not taken into account cognitive developmental differences between children and adults. Therefore, this study sought to test Beck's and Abramson's models in a developmentally-sensitive way.

Results of separate mediation analyses supported both Beck's and Abramson's cognitive vulnerability-stress models of depression. When they were retested using a more developmentally-sensitive weakest link approach, the indirect (meditational) effects of negative life events on depressive symptoms were still significant, no matter whether the mediator tested was a measure of Beck's cognitive triad, or Abramson's negative cognitive style. Furthermore, a conditional process analysis (i.e. moderated mediation) revealed that these indirect effects were significant for all grade levels in the sample. The only difference was with the remaining direct effects of stressful life events on depression (i.e. not through the mediator); in that case, direct effects continued to be significant for 4th graders, but not for 5th, 6th, and, 7th graders.

Appendix A: DSM-IV-TR Diagnostic Criteria for Major Depressive Episode

- A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure. Note: Do not include symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations.
1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful). Note: In children and adolescents, can be irritable mood.
 2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others)
 3. Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. Note: In children, consider failure to make expected weight gains.
 4. Insomnia or hypersomnia nearly every day
 5. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)
 6. Fatigue or loss of energy nearly every day

7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick)
 8. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others)
 9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide
- B. The symptoms do not meet criteria for a Mixed Episode.
- C. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- D. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or general medical condition (e.g., hypothyroidism).
- E. The symptoms are not better accounted for by Bereavement, i.e., after the loss of a loved one, the symptoms persist for longer than 2 months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation.

Appendix B: DSM-IV-TR Diagnostic Criteria for Major Depressive Disorder, Single Episode

- A. Presence of a single Major Depressive Episode.
- B. The Major Depressive Episode is not better accounted for by Schizoaffective Disorder and is not superimposed on Schizophrenia, Schizophreniform Disorder, Delusional Disorder, or Psychotic Disorder Not Otherwise Specified.
- C. There has never been a Manic Episode, a Mixed Episode, or a Hypomanic Episode. Note: This exclusion does not apply if all of the manic-like, mixed-like, or hypomanic-like episodes are substance or treatment induced or are due to the direct physiological effects of a general medical condition.

If the full criteria are currently met for a Major Depressive Episode, *specify* its current clinical status and/or features:

Mild, Moderate, Severe Without Psychotic Features/Severe With Psychotic Features
Chronic
With Catatonic Features
With Melancholic Features
With Atypical Features
With Postpartum Onset

If the full criteria are not currently met for a Major Depressive Episode, *specify* the current clinical status of the Major Depressive Disorder or features of the most recent episode:

In Partial Remission, In Full Remission
Chronic

With Catatonic Features

With Melancholic Features

With Atypical Features

With Postpartum Onset

Appendix C: DSM-IV-TR Diagnostic Criteria for Major Depressive Disorder, Recurrent

- A. Presence of two or more Major Depressive Episodes. Note: To be considered separate episodes, there must be an interval of at least 2 consecutive months in which criteria are not met for a Major Depressive Episode.
- B. The Major Depressive Episode is not better accounted for by Schizoaffective Disorder and is not superimposed on Schizophrenia, Schizophreniform Disorder, Delusional Disorder, or Psychotic Disorder Not Otherwise Specified.
- C. There has never been a Manic Episode, a Mixed Episode, or a Hypomanic Episode. Note: This exclusion does not apply if all of the manic-like, mixed-like, or hypomanic-like episodes are substance or treatment induced or are due to the direct physiological effects of a general medical condition.

If the full criteria are currently met for a Major Depressive Episode, *specify* its current clinical status and/or features:

- Mild, Moderate, Severe Without Psychotic Features/Severe With Psychotic Features
- Chronic
- With Catatonic Features
- With Melancholic Features
- With Atypical Features
- With Postpartum Onset

If the full criteria are not currently met for a Major Depressive Episode, *specify* the current clinical status of the Major Depressive Disorder or features of the most recent episode:

In Partial Remission, In Full Remission

Chronic

With Catatonic Features

With Melancholic Features

With Atypical Features

With Postpartum Onset

Specify:

Longitudinal Course (With and Without Interepisode Recovery)

With Seasonal Pattern

Appendix D: DSM-IV TR Diagnostic Criteria for Dysthymic Disorder

- A. Depressed mood for most of the day, for more days than not, as indicated either by subjective account or observation by others, for at least 2 years.
Note: In children and adolescents, mood can be irritable and duration must be at least 1 year.
- B. Presence, while depressed, of two (or more) of the following:
1. Poor appetite or overeating
 2. Insomnia or hypersomnia
 3. Low energy or fatigue
 4. Low self-esteem
 5. Poor concentration or difficulty making decisions
 6. Feelings of hopelessness
- C. During the 2-year period (1 year for children or adolescents) of the disturbance, the person has never been without the symptoms in Criteria A and B for more than 2 months at a time.
- D. No Major Depressive Episode has been present during the first 2 years of the disturbance (1 year for children and adolescents); i.e. the disturbance is not better accounted for by chronic Major Depressive Disorder, or Major Depressive Disorder, In Partial Remission. Note: There may have been a previous Major Depressive Episode provided there was a full remission (no significant signs or symptoms for 2 months) before development of the Dysthymic Disorder. In addition, after the initial 2 years (1 year in children or adolescents) of Dysthymic Disorder, there may be superimposed episodes of

Major Depressive Disorder, in which case both diagnoses may be given when the criteria are met for a Major Depressive Episode.

- E. There has never been a Manic Episode, a Mixed Episode, or a Hypomanic Episode, and criteria have never been met for Cyclothymic Disorder.
- F. The disturbance does not occur exclusively during the course of a chronic Psychotic Disorder, such as Schizophrenia or Delusional Disorder.
- G. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).
- H. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Specify if:

Early Onset: if onset is before age 21 years

Late Onset: if onset is age 21 years or older

Specify (for most recent 2 years of Dysthymic Disorder):

With Atypical Features

Appendix E: Children's Depression Inventory

Kids sometimes have different feelings and ideas.

This form lists the feelings and ideas in groups. From each group of three sentences, pick one that describes you best for the past two weeks. After you pick a sentence from the first group, go on to the next group.

There is no right answer or wrong answer. Just pick the sentence that best describes the way you have been recently. Put a mark like this X next to your answer. Put the mark in the box next to the sentence you pick.

1. I am sad once in a while.
I am sad many times.
I am sad all the time.
2. Nothing will ever work out for me.
I am not sure if things will work out for me.
Things will work out for me O.K.
3. I do most things O.K.
I do many things wrong.
I do everything wrong.
4. I have fun in many things.
I have fun in some things.
Nothing is fun at all.
5. I am bad all the time.
I am bad many times.
I am bad once in a while.
6. I think about bad things happening to me once in a while.

I worry that bad things will happen to me.

I am sure that terrible things will happen to me.

7. I hate myself.

I do not like myself.

I like myself.

8. All bad things are my fault.

Many bad things are my fault.

Bad things are not usually my fault.

9. I do not think about killing myself.

I think about killing myself, but I would not do it.

I want to kill myself.

10. I feel like crying every day.

I feel like crying many days.

I feel like crying once in a while.

11. Things bother me all the time.

Things bother me many times.

Things bother me once in a while.

12. I like being with people.

I do not being with people many times.

I do not want to be with people at all.

13. I cannot make up my mind about things.

It is hard to make up my mind about things.

I make up my mind about things easily.

14. I look O.K.

There are some bad things about my looks.

I look ugly.

15. I have to push myself all the time to do my schoolwork.

I have to push myself many times to do my schoolwork.

Doing schoolwork is not a big problem.

16. I have trouble sleeping every night.

I have trouble sleeping many nights.

I sleep pretty well.

17. I am tired once in a while.

I am tired many days.

I am tired all the time.

18. Most days I do not feel like eating.

Many days I do not feel like eating.

I eat pretty well.

19. I do not worry about aches and pains.

I worry about aches and pains many times.

I worry about aches and pains all the time.

20. I do not feel alone.

I feel alone many times.

I feel alone all the time.

21. I never have fun at school.

I have fun at school only once in a while.

I have fun at school many times.

22. I have plenty of friends.

I have some friends but I wish I had more.

I do not have any friends.

23. My schoolwork is alright.

My schoolwork is not as good as before.

I do very badly in subjects I used to be good at.

24. I can never be as good as other kids.

I can be as good as other kids if I want to.

I am just as good as other kids.

25. Nobody really loves me.

I am not sure if anybody loves me.

I am sure that somebody loves me.

26. I usually do what I am told.

I do not do what I am told most of the time.

I never do what I am told.

27. I get along with people.

I get into fights many times.

I get into fights all the time.

Appendix F: Beck Depression Inventory for Youth

Name: _____

Here is a list of things that happen to people and that people think or feel. Read each sentence carefully, and circle the one word (Never, Sometimes, Often, or Always) that tells about you best, especially in the last two weeks. THERE ARE NO RIGHT OR WRONG ANSWERS.

	0	1	2	3
1. I think that my life is bad.	Never	Sometimes	Often	Always
2. I have trouble doing things.	Never	Sometimes	Often	Always
3. I feel that I am a bad person.	Never	Sometimes	Often	Always
4. I wish I were dead.	Never	Sometimes	Often	Always
5. I have trouble sleeping.	Never	Sometimes	Often	Always
6. I feel no one loves me.	Never	Sometimes	Often	Always
7. I think bad things happen because of me.	Never	Sometimes	Often	Always
8. I feel lonely.	Never	Sometimes	Often	Always
9. My stomach hurts.	Never	Sometimes	Often	Always
10. I feel like bad things happen to me.	Never	Sometimes	Often	Always
11. I feel like I am stupid.	Never	Sometimes	Often	Always
12. I feel sorry for myself.	Never	Sometimes	Often	Always
13. I think I do things badly.	Never	Sometimes	Often	Always
14. I feel bad about what I do.	Never	Sometimes	Often	Always
15. I hate myself.	Never	Sometimes	Often	Always

16. I want to be alone.	Never	Sometimes	Often	Always
17. I feel like crying.	Never	Sometimes	Often	Always
18. I feel sad.	Never	Sometimes	Often	Always
19. I feel empty inside.	Never	Sometimes	Often	Always
20. I think my life will be bad.	Never	Sometimes	Often	Always

Appendix G: Children's Cognitive Style Questionnaire

Directions: Read the following out loud to the child. For children under age 11, read each scenario and sentence aloud to them and allow them to mark their own responses. For children 11 and older, allow them to read alone and mark their responses.

You're going to read about some situations. Try to imagine yourself in each situation as if it had actually happened to you. Place yourself in each situation and imagine why that would have happened to you, and what you would think if that were to happen to you. It's okay if it has never happened to you before, just imagine what you would think and feel if it were to happen to you. Then read the sentences and circle how much you agree with each sentence.

Don't agree at all	Agree a little	Sort of agree	Mostly agree	Agree a lot
1	2	3	4	5

I. IMAGINE YOU DID REALLY WELL ON A SCIENCE PROJECT AT SCHOOL.

1. If I did well on my science project, it was probably because I am good at science.
1 2 3 4 5
2. If I did well on my science project, it was probably because I always do well at school.
1 2 3 4 5
3. If I did well on my science project, it was probably because the teacher liked everyone's science project that time.
1 2 3 4 5
4. If I did well on my science project, it means I am a good person.
1 2 3 4 5
5. If I did well on my science project, other good things will probably happen to me.
1 2 3 4 5

II. IMAGINE SOME KIDS AT SCHOOL WERE PLAYING A GAME BUT WOULDN'T LET YOU JOIN IN.

1. If the kids wouldn't let me play with them, it was probably because I did something to make them not to play with me that day.
1 2 3 4 5
2. If the kids wouldn't let me play with them, it was probably because they are never nice to me.
1 2 3 4 5
3. If the kids wouldn't let me play with them, it was probably because I'm not good at games.
1 2 3 4 5
4. If the kids wouldn't let me play with them, it means there is something wrong with me.
1 2 3 4 5
5. If the kids wouldn't let me play with them, other bad things will probably happen to me.
1 2 3 4 5

III. IMAGINE YOU DID REALLY BAD ON A MATH TEST AT SCHOOL.

1. If I did bad on a math test, it was probably because I'm not very smart.
1 2 3 4 5
2. If I did bad on a math test, it was probably because I always do bad at math.
1 2 3 4 5
3. If I did bad on a math test, it was probably because everything at school was too hard that day.
1 2 3 4 5
4. If I did bad on a math test, it means there is something wrong with me.
1 2 3 4 5
5. If I did bad on a math test, other bad things will probably happen to me.
1 2 3 4 5

IV. IMAGINE YOU WERE INVITED TO A PARTY BY A KID AT SCHOOL.

1. If I was invited to a party, it was probably because I did something nice for the kid recently.

1 2 3 4 5

2. If I was invited to a party, it was probably because the kid always invites me to his/her parties.

1 2 3 4 5

3. If I was invited to a party, it was probably because I'm a nice person.

1 2 3 4 5

4. If I was invited to a party, it means I am a good person.

1 2 3 4 5

5. If I was invited to a party, other good things will probably happen to me.

1 2 3 4 5

V. IMAGINE YOU HAD TO READ A STORY IN CLASS AND ANSWER QUESTIONS ABOUT IT, BUT YOU GOT MOST OF THE ANSWERS WRONG.

1. If I got the answers wrong, it was probably because I wasn't good at reading that day.

1 2 3 4 5

2. If I got the answers wrong, it was probably because I always do poorly at school.

1 2 3 4 5

3. If I got the answers wrong, it was probably because the teacher gives assignments that are too hard.

1 2 3 4 5

4. If I got the answers wrong, it means there is something wrong with me.

1 2 3 4 5

5. If I got the answers wrong, other bad things will probably happen to me.

1 2 3 4 5

VI. IMAGINE YOUR BEST FRIEND WOULDN'T TALK TO YOU ONE DAY.

1. If my friend wouldn't talk to me, it was probably because I did something to make my friend mad at me.
1 2 3 4 5
2. If my friend wouldn't talk to me, it was probably because my friend is the kind of person who gets mad a lot.
1 2 3 4 5
3. If my friend wouldn't talk to me, it was probably because I am not a nice person.
1 2 3 4 5
4. If my friend wouldn't talk to me, it means there is something wrong with me.
1 2 3 4 5
5. If my friend wouldn't talk to me, other bad things will probably happen to me.
1 2 3 4 5

**Appendix H:
Diagnostic and Statistical Manual
Brief Symptom Interview for Depression**

Symptoms: Ask about symptoms being present most days for THE LAST TWO WEEKS, INCLUDING TODAY.	Symptom IS present (√)	Symptom NOT present (√)
1. Have you been feeling sad, unhappy, blue, or down in the dumps for a lot of the day?		
2. Have you been feeling irritable, cranky, or easily annoyed for a lot of the day?		
3. Have you been less interested in doing things like hobbies or sports?		
4. Have you been enjoying hobbies or interests less than you did in the past?		
5. Have you noticed a change in your appetite (eating more or less than usual)? Has your weight changed or do your clothes fit differently?		
6. Have you had any trouble with your sleep, such as falling asleep, waking up at night, or waking too early?		
7. Have you been having trouble with your sleep, in that you are sleeping a lot more than usual?		
8. Do you feel like you still need sleep or rest, even if you got a full night's sleep?		
9. Do you feel like you have no energy, or not at much energy as usual?		
10. Do you feel restless or fidgety, that you have a hard time sitting still?		
11. Have you felt slowed down, like you are moving in slow motion or your movements are not as quick as usual?		
12. Have you had trouble concentrating or paying attention, like your mind is "in a fog?" Or trouble making decisions?		
13. Have you felt guilty about things lately?		
14. Have you felt hopeless, like things won't work out for you, or that you will always feel bad?		
15. Have you felt worthless, inadequate, or like you are no good lately?		
16. Have you had thoughts of death or dying?		
17. Have you had thoughts of wanting to hurt yourself?		

(or someone else)		
18. Have you done anything to hurt yourself, such as make a mark on your skin?		

TOTAL "PRESENT" Items 1-18: _____

Appendix I: Cognitive Triad Inventory for Children

Instructions: Circle the answer which best describes your opinion. Choose only one answer for each idea. Answer the items for what you are thinking RIGHT NOW. Remember, fill this out for how you feel today.

- | | | | |
|---|-----|-------|----|
| 1. I do well at many different things. | Yes | Maybe | No |
| 2. Schoolwork is no fun. | Yes | Maybe | No |
| 3. Most people are friendly and helpful. | Yes | Maybe | No |
| 4. Nothing is likely to work out for me. | Yes | Maybe | No |
| 5. I am a failure. | Yes | Maybe | No |
| 6. I like to think about the good things that will happen for me in the future. | Yes | Maybe | No |
| 7. I do my schoolwork ok. | Yes | Maybe | No |
| 8. The people I know help me when I need it. | Yes | Maybe | No |
| 9. I think that things will be going well for me a few years from now. | Yes | Maybe | No |
| 10. I have messed up almost the best friendships I have ever had. | Yes | Maybe | No |
| 11. Lots of fun things will happen for me in the future. | Yes | Maybe | No |
| 12. The things I do every day are fun. | Yes | Maybe | No |
| 13. I can't do anything right. | Yes | Maybe | No |
| 14. People like me. | Yes | Maybe | No |
| 15. There is nothing left in my life to look forward to. | Yes | Maybe | No |
| 16. My problems and worries will never go away. | Yes | Maybe | No |

- | | | | |
|--|-----|-------|----|
| 17. I am as good as other people I know. | Yes | Maybe | No |
| 18. The world is a very mean place. | Yes | Maybe | No |
| 19. There is no reason for me to think that things will
get better for me. | Yes | Maybe | No |
| 20. The important people in my life are helpful and nice
to me. | Yes | Maybe | No |
| 21. I hate myself. | Yes | Maybe | No |
| 22. I will solve my problems. | Yes | Maybe | No |
| 23. Bad things happen to me a lot. | Yes | Maybe | No |
| 24. I have a friend who is nice and helpful to me. | Yes | Maybe | No |
| 25. I can do a lot of things well. | Yes | Maybe | No |
| 26. My future is too bad to think about. | Yes | Maybe | No |
| 27. My family doesn't care what happens to me. | Yes | Maybe | No |
| 28. Things will work out okay for me in the future. | Yes | Maybe | No |
| 29. I feel guilty for a lot of things. | Yes | Maybe | No |
| 30. No matter what I do, other people make it hard for
me to get what I need. | Yes | Maybe | No |
| 31. I am a good person. | Yes | Maybe | No |
| 32. There is nothing to look forward to as I get older. | Yes | Maybe | No |
| 33. I like myself. | Yes | Maybe | No |
| 34. I am faced with many difficulties. | Yes | Maybe | No |
| 35. I have problems with my personality. | Yes | Maybe | No |
| 36. I think that I will be happy as I get older. | Yes | Maybe | No |

Appendix J: Life Events Checklist

Below is a list of things that sometimes happen to people. Put an “X” in the space by each of the events you have experienced during the past year (12 months). For each of the events you check, also mark whether the event was a good event or bad. Finally, choose how much you feel the event has changed or has had an effect on your life by placing a circle around the statement that best fits you (no effect – some effect – medium effect – big effect). Remember, for each event you have experienced during the past year, (1) mark an “X” in the space to show that you have experienced the event, (2) mark whether you think the event was good or bad, and mark how much effect the event has had on your life.

Event	Has it happened to you?	Type of event		Effect on you			
		Good	Bad	No effect	Some effect	Medium effect	Big effect
1. Moving to a new home.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
2. New brother or sister.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
3. Changing to new school.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
4. Serious illness or injury to a family member.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
5. Parents divorced.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
6. Major arguments	_____	Good	Bad	No	Some	Medium	Big

between you and mom or dad.				effect	effect	effect	effect
7. Mother or father lost job.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
8. Death of a family member.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
9. Parents separated.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
10. Death of a close friend.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
11. Increased absence of parent from home.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
12. Brother or sister leaving home.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
13. Serious illness or injury of close friend.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
14. Parent getting into trouble with the law.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
15. Parent getting a new job.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
16. New stepmother or stepfather.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
17. Parent going to jail.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
18. Change in parents' financial status (less money at home)	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
19. Trouble with brother or sister.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect

20. Special recognition for good grades.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
21. Joining a new club.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
22. Losing a close friend.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
23. Decrease in number of arguments with parents.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
24. Making the honor roll.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
25. New boyfriend or girlfriend.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
26. Failing a grade.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
27. Increase in number of arguments with parents.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
28. Getting into trouble with police.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
29. Major personal illness or injury.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
30. Breaking up with boyfriend/girlfriend.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
31. Making up with boyfriend/girlfriend.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
32. Trouble with teacher.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
33. Failing to make an athletic team.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect

34. Being suspended from school.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
35. Making failing grades on report card.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
36. Making an athletic team.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
37. Trouble with classmates.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
38. Special recognition for athletic performance.	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
Other events, in the past year, that have had an impact on your life.							
39. _____	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
40. _____	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect
41. _____	_____	Good	Bad	No effect	Some effect	Medium effect	Big effect

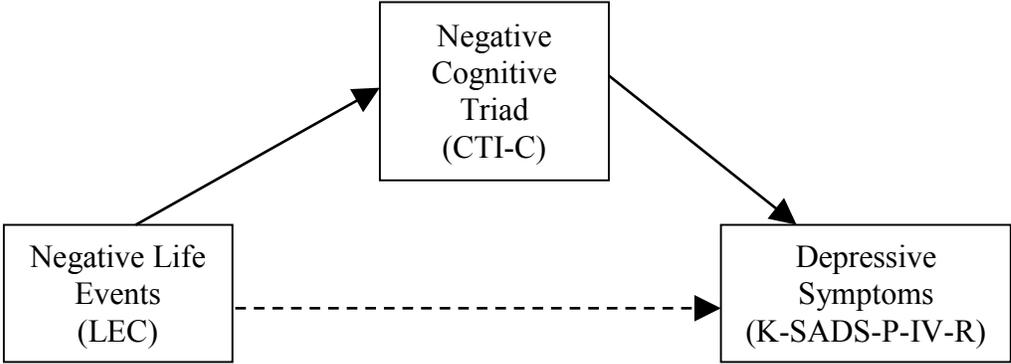
Tot-PC: _____

Mean-QualGE: _____

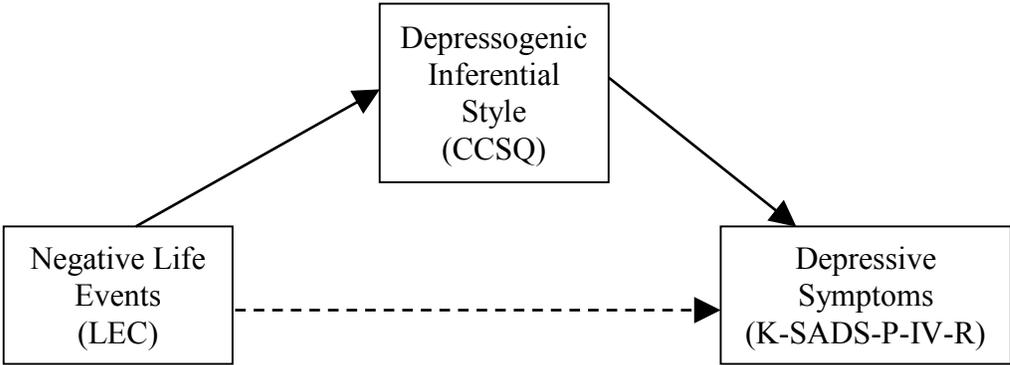
Tot-NC: _____

Mean-QualBE: _____

Appendix K: Overview of Hypotheses

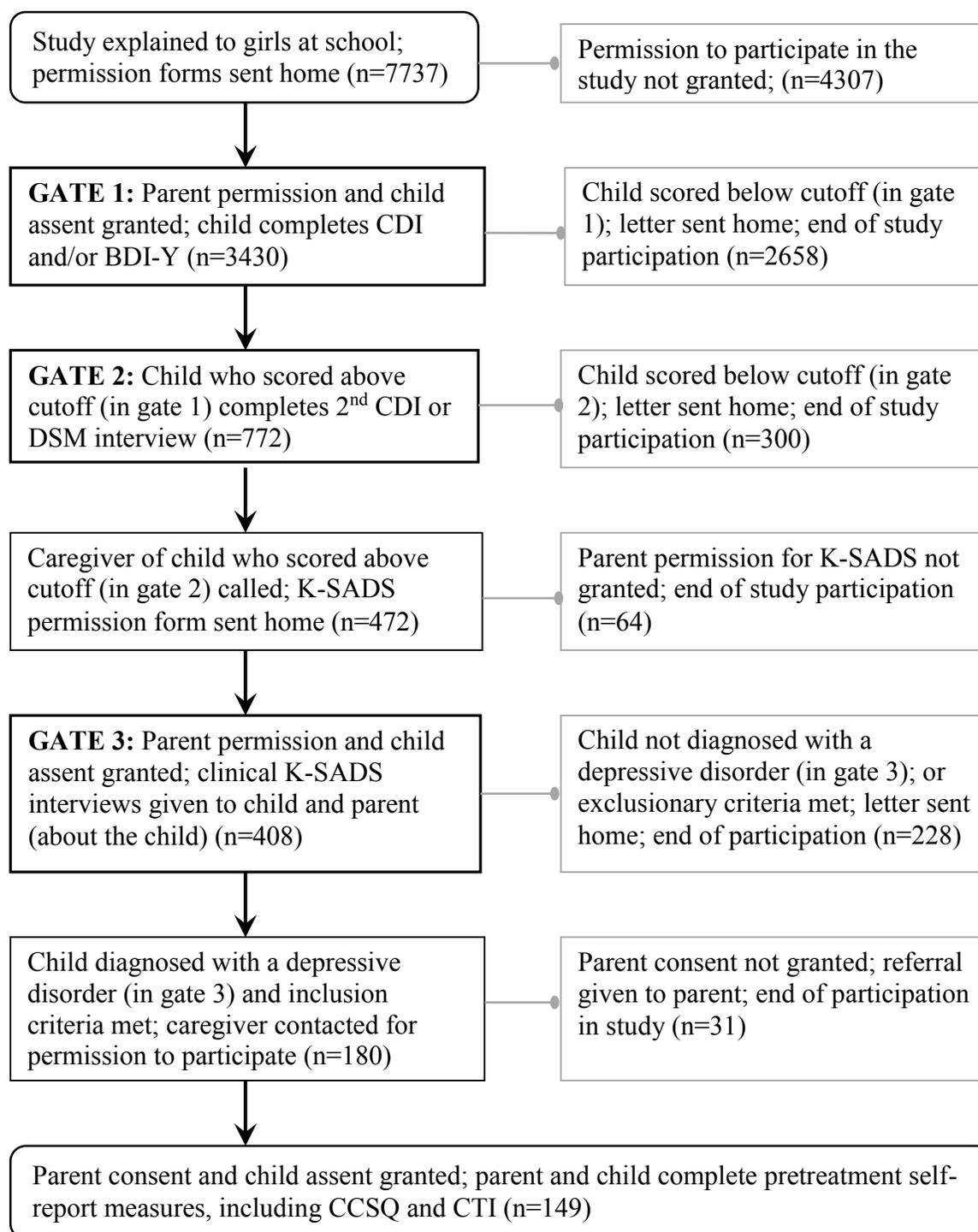


Beck's Mediation Model of Depression (Hypothesis 1 and Hypothesis 2)



Abramson's Mediation Model of Depression (Hypothesis 3 and Hypothesis 4)

Appendix L: Screening Procedures for “Depressed” Group



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