DEVELOPMENT AND VALIDATION OF THE CHILD AND ADOLESCENT DYSFUNCTIONAL ATTITUDES SCALE: TESTS OF BECK'S COGNITIVE DIATHESIS-STRESS THEORY OF DEPRESSION, OF ITS CAUSAL MEDIATION COMPONENT, AND OF DEVELOPMENTAL EFFECTS

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Table of Contents

Abstract	iii
Résumé	v
Acknowledgeme	entsvii
Statement of Original Contributionsix	
GENERAL INT	RODUCTION1
STUDY ONE:	Development and Psychometric Validation of the
	Child and Adolescent Dysfunctional Attitudes Scale
Introduction28	
Method	
Results and Discussion	
STUDY TWO:	Construct Validity of the CADAS – Testing the
	Diathesis-Stress and Causal Mediation Components of Beck's
	Theory, and the Developmental Hypothesis, in Children
Introduction42	
Method	
Results and Discussion48	
GENERAL DISCUSSION	
REFERENCES	
TABLES117	
FIGURES	
APPENDICES131	

Abstract

Beck's cognitive diathesis-stress theory has generated much research into the etiology of depression. Central to the theory are depressogenic schemata that interact with stressors, resulting in increases in depressive symptomatology. These schemata are commonly assessed using the Dysfunctional Attitudes Scale (DAS). Importantly, the DAS was not designed for use in children – it has been validated with adults and contains advanced language. Thus, the Child and Adolescent Dysfunctional Attitudes Scale (CADAS) was developed.

Study 1 sought to psychometrically validate the CADAS. 453 children completed the CADAS item pool and measures assessing divergent validity. The CADAS was readministered 3 weeks later. Items were retained based on item-total correlations, internal consistency, and factor analyses. The finalized CADAS is a 22item self-report measure with a unidimensional factor structure and sound psychometric properties.

Study 2 tested Beck's theory using the CADAS to assess depressogenic schemata as a vulnerability factor for depression. An independent sample of 241 children completed the CADAS and a measure of depression one week before receiving school report cards (Time 1). The morning after receiving reports (Time 2), stress was assessed by obtaining parents' reactions to reports, and with an index of children's subjective acceptable grades compared to actual grades. Five days later (Time 3), depression was reassessed.

As hypothesized, regression analyses collapsing across age revealed that Time 1 CADAS interacted with Time 2 parental stress to predict changes in depression from Times 1 to 3. High-CADAS children showed greater increases in depression relative to low-CADAS children when facing the stress of parental anger and disappointment regarding their grades. Consistent with cognitive-developmental theory, planned supplemental analyses indicated that the CADAS × stress interaction predicted depressive changes only in older, formal-operational children. The relationship between the CADAS × stress interaction and depressive changes was mediated by negative views of the self, but not by views of the world or of the future.

This work yields a measure of depressogenic schemata in school-aged children that further contributes to understanding their etiology of depression. These schemata, together with negative views of oneself, may be important targets for modification in the cognitive therapy of childhood depression.

Résumé

La théorie cognitive vulnérabilité-stress de Beck a suscité de nombreuses recherches dans l'étude de l'étiologie de la dépression. Cette théorie soutient que la dépression est accentuée lorsque les schémas dépressogènes entrent en interaction avec les agents stressants. Les schémas dépressogènes sont communément mesurés à l'aide du "Dysfunctional Attitudes Scale" (DAS). Cependant le DAS ne peut être administré aux enfants, car l'échelle a été validée avec des adultes et présente un niveau de langage avancé. Le "Child and Adolescent Dysfunctional Attitudes Scale" (CADAS) a donc été développé.

L'étude 1 avait pour but de valider psychométriquement le CADAS. 453 enfants ont rempli une version du CADAS ainsi que des mesures de validité discriminante. Le CADAS leur a été réadministré trois semaines plus tard. Certains items de l'échelle ont été conservés sur la base de corrélations inter-items, de la cohérence interne, et d'analyses factorielles. La version finale du CADAS contient 22 items et possède une structure factorielle unidimensionnelle ainsi que de bonnes qualités psychométriques.

L'étude 2 avait pour but de vérifier la théorie de Beck en utilisant le CADAS afin de mesurer les schémas dépressogènes en tant que facteurs de vulnérabilité pour la dépression. Un échantillon indépendant de 241 enfants a rempli le CADAS ainsi qu'une mesure de dépression une semaine avant la réception du bulletin scolaire (Temps 1). Le lendemain de l'obtention du bulletin (Temps 2), le niveau de stress des enfants a été évalué à l'aide d'une mesure de la réaction des parents face au bulletin, ainsi qu'à l'aide d'une mesure comparant les notes scolaires acceptables du point de vue de l'enfant aux notes réelles obtenues au bulletin. Cinq jours plus tard (Temps 3), le niveau de dépression des enfants a été évalué à nouveau.

Conformément à l'hypothèse, des analyses de régression combinant tous les niveaux d'âge ont démontré que les résultats obtenus au CADAS au Temps 1 interagissaient avec l'agent stressant parental au Temps 2 dans la prédiction des changements au niveau de la dépression du Temps 1 au Temps 3. Plus précisément, suite au stress vécu découlant de la colère et de la déception des parents par rapport au bulletin, le niveau de dépression des enfants ayant obtenu un résultat élevé au CADAS a augmenté davantage que celui des enfants ayant obtenu un faible résultat au CADAS. De plus, conformément aux théories cognitives-développementales, l'interaction CADAS × stress, en divisant l'échantillon par l'âge median, a prédit les changements au niveau de la dépression seulement chez les enfants plus âgés ayant atteint le stade des opérations formelles. Enfin, la relation entre l'interaction CADAS × stress et les changements au niveau de la dépression a été médiée par les perceptions négatives de soi, mais non par les perceptions du monde ou du futur.

La présente recherche, en développant une mesure des schémas dépressogènes chez les enfants d'âge scolaire, a contribué à la compréhension de l'étiologie de la dépression au sein de cette population. Il semble que ces schémas, en combinaison avec des perceptions négatives de soi, constituent des cibles importantes à modifier lors d'une thérapie cognitive de la dépression chez l'enfant.

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Statement of Original Contributions

Researchers using the Dysfunctional Attitudes Scale (DAS) have shown that adults who endorse high levels of depressogenic schemata are likely to experience the onset or exacerbation of depressive symptomatology when confronted with stressful life events. This diathesis-stress model, based on Beck's (1967, 1987) influential cognitive theory of depression, has yet to be adequately tested in younger age groups because of the absence of a child and adolescent measure of depressogenic schemata. The present thesis fills this void. Study 1 presents a new self-report measure of depressogenic schemata, the Child and Adolescent Dysfunctional Attitudes Scale (CADAS), and demonstrates the scale's psychometric properties and discriminant validity. Study 2 proceeds to longitudinally test Beck's theory using the CADAS as a measure of depressogenic schemata. This is the first study to demonstrate that such schemata act as a vulnerability factor for depression in children as young as 11 years. Study 2 also tests the causal mediation component of Beck's theory with each of the three constructs that form the negative cognitive triad. As well, Study 2 presents a developmental psychopathological approach that examines cognitive developmental factors, such as the attainment of formal operational cognitive skills. Thus, Study 2 addresses how one's level of cognitive development may moderate the contentions of Beck's cognitive theory of depression. Together, these studies make a significant contribution to our understanding of the origins of depressive symptomatology in children.

General Introduction

Despite the fact that depression was once conceptualized as a condition not applicable to child populations (Lefkowitz & Burton, 1978), within the last two decades a vast literature has emerged indicating that childhood depression is indeed a valid construct. Conventional operationalizations of childhood depressive disorders differ little from adult conceptualizations that focus on affective, cognitive, behavioural, and somatic disturbances (American Psychiatric Association [APA], 1994; Hammen, 2001). Affective symptoms include depressed mood, sadness, or a loss of pleasure from engaging in once enjoyable activities. In children, irritability may be considered an affective symptom. Cognitive symptoms include thoughts of worthlessness or guilt, amotivation, a sense of hopelessness, and suicidal ideation. Indecisiveness and a decreased ability to concentrate are also common. Behavioural symptoms of depression encompass withdrawal from social networks and from typical activities, as well as psychomotor retardation exemplified by slowed movement and verbalizations. Conversely, people with depression may exhibit psychomotor agitation, exemplified by pacing or fidgeting. Somatic symptoms include fluctuations in appetite or weight, sleep disturbances characterized by reduced or increased hours of sleep, subjective decreases in levels of energy, and increased fatigue.

Current diagnostic criteria (APA, 1994) acknowledge only two variations in childhood depression when compared to its adult counterpart, specifically the aforementioned inclusion of irritability as a potential affective symptom, and a shorter required duration of symptomatology in dysthymic disorder (one year instead of two). Developmental psychopathologists have questioned this relative uniformity between

childhood and adult depression (Cicchetti & Schneider-Rosen, 1984; Cicchetti & Toth, 1998; Digdon & Gotlib, 1985; Garber, 1992, 2000; Garber & Flynn, 2001). Rather, developmental psychopathologists encourage an examination of how normative developmental processes across the lifespan may affect the expression of depressive symptoms. Illustratively, core symptoms may be differentially expressed across the lifespan. For example, sadness may be expressed with prolonged crying in preschoolers, but with irritability in adolescents. Alternatively, cognitive or physical maturation may be a prerequisite for the manifestation of certain symptoms. For example, only as children approach adolescence do they possess the abstract cognitive skills that go beyond concrete thinking to facilitate the emergence of symptoms such as hopelessness, guilt, and subjective worthlessness (Garber & Flynn, 2001; Weiner, 1985).

Epidemioligical studies reveal that depression is not only a valid theoretical construct in children, but also increasingly prevalent. The point prevalence of major depression in children ranges from 1% (McGee & Williams, 1988) to 6% (Kessler & Walters, 1998; see also Kessler, Avenevoli, & Merikangans, 2001). By adolescence, the lifetime prevalence rate ranges from 8.3% to 18.5%. While in pre-adolescence the lifetime prevalence of depression is similar in both genders, in adolescent girls the rate (24%) is twice that of adolescent boys (Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993). This increase in knowledge regarding the impact of childhood depression has been accompanied by research into theories geared to explain its etiology. Researchers have studied the role of genetics, neurobiology (e.g., neurotransmitter dysfunction, functional and anatomical brain anomalies) and psychological factors (e.g., stress,

interpersonal events, cognitive variables) in the expression of depressive disorders. From a cognitive perspective, Beck's (1967, 1987) cognitive theory of depression has generated a large body of research into the development of depressive symptoms.

Beck's Cognitive Diathesis-Stress Theory of Depression

Beck's (1967, 1987) cognitive theory of depression regards depressogenic schemata as central to the emergence of symptomatology. These schemata are defined as bodies of knowledge that direct information processing by guiding the comprehension, encoding, and retrieval of information available from one's environment or memory. Individuals' expectations, interpretations, and attention are tainted by these schemata, resulting in an information processing system biased to yield negative self-themes and erroneous cognitions. Such faulty information processing increases the likelihood that one will develop what Beck described as the negative cognitive triad, specifically a negative view of the self, of the world, and of the future. This triad is conceptualized as a proximal and sufficient cause of depression, resulting in the characteristic affective, behavioural, cognitive, and physiological symptoms of depression.

A key property of Beck's (1967, 1987) theory of depression is its diathesis-stress component. Depressogenic schemata act as vulnerability factors that interact with negative life events to yield the negative cognitive triad and, consequently, depressive symptoms. Thus, the theory hypothesizes an association between depressogenic schemata and depression only in the presence of negative life stressors. Individuals carrying depressogenic schemata who do not experience negative stressors are not

expected to develop depressive symptoms, much like individuals who do not carry the schemata at all. This tenet of theory has important implications for testing the etiological chain it proposes, as discussed by Abramson, Alloy, and Metalsky (1988) and Alloy, Hartlage, and Abramson (1988). Vulnerability factors, in this case depressogenic schemata, must be assessed prior to the occurrence of potential stressors to ascertain if the potential underlying vulnerability interacts with an upcoming stressor to predict the onset, or increased levels, of depression.

Beck's (1967, 1987) theory also may be conceptualized as a causal mediation theory (Abela & D'Alessandro, 2002; Joiner, Metalsky, Lew, & Klocek, 1999). It contends that a diathesis × stress interaction increases the likelihood that one will develop the negative cognitive triad, and that this triad is a proximal and sufficient cause of depression. Thus, negative views of the self, of the world, and of the future are viewed as mediators of the relationship between the diathesis × stress interaction and the emergence of depressive symptoms. Again, this component of the theory has important implications for its empirical validation, as reviewed by Abramson et al. (1988) and Alloy et al. (1988), requiring explicit assessment of the negative cognitive triad and subsequently examining its mediational role (see Baron & Kenny, 1986).

Beck's (1967, 1987) theory thus predicts that following the occurrence of a stressful event, individuals with high degrees of depressogenic schemata will show greater increases in depressive symptoms relative to individuals low in depressogenic schemata. High levels of such schemata moderate the impact of the stressful event to yield negative views of the self, of the world, and of the future. These three latter

constructs are considered proximal and sufficient causes of the onset, or exacerbation, of depressive symptomatology.

Dysfunctional Attitudes as a Measure of Depressogenic Schemata

Depressogenic schemata are most often operationalized as dysfunctional attitudes and assessed with the Dysfunctional Attitudes Scale (DAS; Weissman, 1979; Weissman & Beck, 1978), the only self-report measure specifically designed to measure depressogenic schemata (Segal, 1988). The DAS assesses rigid beliefs that are hypothesized by Beck (1967, 1987) to represent vulnerabilities for depression (e.g., "If I do not do well all of the time, people will not respect me.").

In the adult literature, attempts to validate the diathesis-stress component of Beck's theory have yielded mixed results. Initially, researchers most often used crosssectional methodologies to examine the diathesis-stress component of the theory whereby dysfunctional attitudes, life stress, and depressive symptoms were measured concurrently to test the hypothesis that the interaction between dysfunctional attitudes (the diathesis) and life stress will predict current symptomatology. While some crosssectional research has supported the diathesis-stress component (e.g., Olinger, Kuiper, & Shaw, 1987; Wise and Barnes, 1986), other research has failed to support Beck's theory (e.g., Robins & Block, 1989; Robins, Block, & Peselow, 1990; for nonsupportive results when testing irrational beliefs as a diathesis, see Smith, Boaz, & Denney, 1984).

Thus, early attempts to validate depressogenic schemata as vulnerabilities to depression were divided regarding support for Beck's (1967, 1987) theory. However, it is important to note that such cross-sectional research is not an adequate test of Beck's

theory regarding the etiology of depression. Cross-sectional designs preclude the assessment of the cognitive diathesis prior to the onset of a life stressor. Consequently, cross-sectional methodologies fail to demonstrate that the interaction between a pre-existing diathesis and a subsequent stressor predicts the increase in, or onset of, depressive symptomatology.

Appropriate Tests of Diathesis-Stress Theories of Depression

Given the limitations inherent in cross-sectional designs when testing diathesisstress models, prospective longitudinal investigations are a more appropriate test of Beck's (1967, 1987) theory. As expounded by Abramson et al. (1988) and Alloy et al. (1988), it is important to assess vulnerabilities, that is, depressogenic schemata or dysfunctional attitudes, prior to the onset of life stressors to determine if the diathesisstress interaction predicts increases in depressive symptoms after the stressors' occurrence.

However, such longitudinal research has also yielded inconsistent results. Using irrational beliefs as a vulnerability factor (see Ellis, 1962), Persons and Rao (1985) found no diathesis-stress interaction predicting increases in depressive symptoms seven months following the discharge of inpatient participants. Two studies by Barnett and Gotlib (1988a, 1990) using depressogenic schemata as vulnerability factors similarly failed to support the diathesis-stress hypothesis with nonsignificant DAS × life event interactions. That is, these studies found no unique vulnerability for depression in individuals with high levels of depressogenic schemata and who experienced stressful events.

In contrast to these nonsupportive findings, four more recent longitudinal investigations have been conducted in adult samples that have supported Beck's (1967, 1987) theory. In a three-month longitudinal investigation using a college sample, Kwon and Oei (1992) reported that dysfunctional attitudes interacted with life stressors to predict increases in depressive symptomatology. In an early test of the theory's causal mediation component, they also suggested that general negative automatic thoughts mediated the relationship between DAS scores and increased depression in high-stress participants. However, the results also allowed the interpretation of automatic negative thoughts and dysfunctional attitudes as consequences of depression, postulating a vicious circle by which maladaptive cognitions lead to, as well as result from, depressive episodes.

Dykman and Johll (1998) employed a 14-week prospective methodology and found that initially nondepressed female college students who were high in dysfunctional attitudes who later experienced stressful life events manifested greater increases in depression relative to other individuals. The researchers speculated that females may engage in more negative self-referent cognitions (Dykman, 1996) and ruminate on such cognitions for prolonged periods (Nolen-Hoeksema, 1990) relative to males.

In a study that examined the effects of naturalistic stressors, Joiner et al. (1999) reported that college students endorsing high degrees of dysfunctional attitudes who subsequently received unsatisfactory exam results exhibited increases in depressive symptomatology relative to other students. Further, in line with the causal mediation component of Beck's (1967, 1987) theory, Joiner and colleagues reported that

depressive cognitions, and not anxious cognitions, mediated the relationship between the $DAS \times midterm$ outcome interaction and increases in depressive symptoms.

In another naturalistic study, Abela and D'Alessandro (2002) found that high school seniors with high DAS scores who subsequently received a negative university admissions outcome showed greater increases in depressive symptoms relative to other participants immediately following knowledge of their application status. The authors also reported that the relationship between the DAS × admissions outcome interaction and increased symptomatology was mediated by negative thoughts of the future, a specific component of the negative cognitive triad. However, contrary to predictions, the relationship was not mediated by negative thoughts of the self. Negative thoughts of the world were not assessed in this study. Also contrary to predictions was the fact that the DAS × admissions outcome interaction did not predict enduring depressed mood as assessed four days after receiving admissions outcomes.

Recently, research aimed at examining the role of depressogenic schemata as vulnerability factors to depression in adolescents has also been conducted. In a large sample of students in grades 9 to 12, Lewinsohn, Joiner, and Rohde (2001) assessed dysfunctional attitudes using a subset of DAS items. Stressful life events were measured at a follow-up assessment one year later. Results provided some support for Beck's (1967, 1987) theory, as adolescents high in dysfunctional attitudes who experienced high degrees of life stress tended to have a higher incidence of major depression relative to others (the significance level reached that of a trend).

To summarize, four studies in the adult literature have yielded support for depressogenic schemata as a vulnerability to depression as predicted by Beck (1967, 1987). Another study suggested that depressogenic schemata may also act as a depressive vulnerability factor in adolescents. Tempering these results are other studies that failed to support Beck's cognitive theory of depression. Diverse results among these longitudinal investigations may be due to several factors. First, studies differed with regard to the timing of follow-up assessments of depression after the occurrence of life stressors, ranging from shortly after the stressor (e.g., Abela & D'Alessandro, 2002) to months later (e.g., Kwon & Oei, 1992). Second, while most studies used the DAS to assess vulnerability to depression, other investigations assessed vulnerability with other measures that are used less commonly (e.g., Persons & Rao, 1985). Third, with regard to testing the causal mediation component of Beck's theory, researchers have used a range of methods to measure the proximal and sufficient causes of depression, from broad classes of cognitions (e.g., Joiner et al., 1999) to one-item assays of specific components of the negative cognitive triad (Abela & D'Alessandro, 2002).

The Importance of Explicitly Testing Beck's Theory in Children

Despite this emergence of studies that suggest that depressogenic schemata may act as vulnerabilities to depression in adults within the context of Beck's (1967, 1987) diathesis-stress theory, and despite the recent progression of these investigations to include adolescent samples, it remains unresolved whether depressogenic schemata also serve as vulnerability factors in children. The extension of this line of research to even younger populations has not yet taken place, and there has been no longitudinal research that has explicitly and adequately examined Beck's (1967, 1987) diathesis-stress theory in children. This is likely attributable to the lack of a validated means of assessing depressogenic schemata in this younger population.¹ Specifically, the DAS contains advanced language that may be beyond the cognitive capacities of younger children. The simplification of language is not necessarily the only step required in applying assessments intended for adults to younger individuals. As stated by Garber (1992),

Methods taken from the adult literature and used with children need to be made developmentally appropriate with respect to both the linguistic and cognitive demands placed on the child (Bierman, 1984; Kovacs, 1986). Simply changing the wording, however, may not be enough. It is often necessary to alter the meaning of the questions to put them into a language and context that children can comprehend. (p. 237)

Furthermore, the DAS has been validated using adult participants, and has not been established psychometrically as a valid instrument for child administration. Thus, the lack of an empirically validated measure of dysfunctional attitudes appears, as of yet, to have precluded a test of Beck's theory in children.

¹ Researchers have assessed children's self-schemata, which differ from Beck's notion of depressogenic schemata in their exclusive reference to the self. Depressogenic schemata have more global referents. In an attempt to assess self-schemata and their relation to depression, Hammen and Zupan (1984) used a depth-of-processing task where children between the ages of seven and twelve years encoded positive and negative words under either structural or self-referent instructions. Children were subsequently asked to recall these words. Results indicated that the self-schema construct is applicable to children since greater self-referent words were recalled relative to those encoded under structural instructions. Content-specificity, however, was supported only in nondepressed children whose recall was greater for positive attributes they ascribed to themselves and for negative attributes that were not like them. Depressed children did not exhibit such content-specific schemata. However, a subsequent examination of children's self-schemata (Prieto, Cole, & Tageson, 1992) found that depressed eight- to twelve-year-olds revealed less positive self-schemata than did nondepressed children as assessed with word recognition and recall tasks.

The existence of research supporting depressogenic schemata as vulnerability factors to depression in adolescents and adults does not render similar research with children redundant. Findings cannot be simply extrapolated downward to children. Rather, theories must be explicitly tested in different age groups to take into account possible developmental changes in cognition, emotional expression, physiology, and behaviour that may pertain to a theory's tenets (Cicchetti & Toth, 1998; Digdon & Gotlib, 1985; Garber & Flynn, 2001). For example, young children (up to about 11 years) are prone to thinking concretely and respond predominantly to present circumstances. In contrast, older children begin to develop the capacity to think abstractly, to hypothesize, and to generalize across situations and time without being constrained to the present (Inhelder & Piaget, 1958). Such developmental progressions require researchers to examine cognitive diathesis-stress theories of depression across the lifespan. One cannot assume that what is true of adults or of adolescents will also be true of children. It also cannot be assumed that what is true of older children will also be true of younger children.

Assessment of Dysfunctional Attitudes in Nonetiological Childhood Studies

It must be noted that despite these limitations in assessing depressogenic schemata in children using adult-based methods, the DAS has been administered to children in studies to assess vulnerability. However, these studies did not test Beck's (1967, 1987) diathesis-stress theory of etiology. Using a cross-sectional design, Garber, Weiss, and Shanley (1993) administered the DAS to children and adolescents in grades 7 to 12. Importantly, the wording of items was altered or simplified to enhance comprehension in this age group. Correlational analyses revealed that greater levels of depressive symptomatology were associated with higher levels of dysfunctional attitudes and with other measures of depressive cognitions.

Garber and Robinson (1997) used the same modified version of the DAS as did Garber et al. (1993) to assess dysfunctional attitudes in grade six children (mean age = 11.87 years) that were either at high risk or low risk for depression based upon a maternal history of mood disorders. The researchers found that while high-risk children had a more negative cognitive style on several measures (e.g., lower perceived selfworth, academic competence, behavioural competence, more depressogenic attributional style, self-criticism, and negative automatic thoughts) compared to low-risk children, they did not differ in their DAS scores. The authors speculated that 11- and 12-year old children may not yet have developed the schemata represented in DAS items but that they might do so as they mature cognitively. Alternatively, the researchers proposed that such attitudes may require activation or priming to be adequately assessed (see Miranda & Persons, 1988; Persons & Miranda, 1992). Finally, they also offer the possibility that depressogenic schemata, operationalized as dysfunctional attitudes, might not be a cognitive vulnerability to depression as discussed by Barnett and Gotlib (1988b) and Haaga, Dyck, and Ernst (1991). It should be reiterated, however, that some previous investigations that have suggested that depressogenic schemata are not vulnerabilities to depression were conducted using methodologies, such as crosssectional designs, that may not offer ideal tests of Beck's (1967, 1987) diathesis-stress model.

Thus, the DAS has been administered to children yielding mixed results regarding the association between depressogenic schemata and depression in this population. It is noteworthy that the version of the DAS employed was not validated psychometrically in children, although internal consistency was at an acceptable level in both studies. Further, as mentioned, the wording of some items was altered to facilitate comprehension in younger samples. Last, while these studies examined the important issue of the concurrent relationship between depression and DAS scores, as well as between risk for depression and DAS scores, they did not address Beck's (1967, 1987) theory regarding the etiology of depression. That is, they did not assess stressful events and did not examine the interaction of such stressors with dysfunctional attitudes in predicting depression.

Other Cognitive Constructs Within Beck's Theory

Researchers have considered other constructs besides dysfunctional attitudes in attempts to assess children's depressogenic cognitions that are within the scope of Beck's (1967, 1987) theory. Haley, Fine, Marriage, Moretti, and Freeman (1985) constructed the Cognitive Bias Questionnaire for Children (CBQC) in which children respond to a series of vignettes with options representing various degrees of cognitive distortion. These distortions, according to Beck (1967), represent a tendency to misconstrue the interpretation of occurrences that is congruent with a negative outlook of oneself, the world, and the future. The CBQC was administered to 39 inpatient and outpatient children aged 8 to 16 years old who had either affective or nonaffective

disorders. Depressive and distorted responses were associated with greater severity of depression and differentiated children with affective and nonaffective disorders.

Leitenberg, Yost, and Carroll-Wilson (1986) developed the Children's Negative Cognitive Error Questionnaire (CNCEQ), a self-report measure of negative cognitive errors for children in grades four to eight that assesses tendencies to engage in thinking patterns such as overgeneralization, "catastrophizing", assuming responsibility, and selective abstraction as discussed by Beck, Rush, Shaw, and Emery (1979). Children who reported symptoms of depression, low self-esteem, and evaluation anxiety concurrently reported greater tendencies to make such cognitive errors.

Kaslow, Stark, Printz, Livingston, and Ling Tsai (1992) developed the Cognitive Triad Inventory for Children (CTI-C), a self-report measure that assesses levels of negative views of the self, world, and future according to the negative cognitive triad. Depressed children and children with both depression and anxiety reported a more negative view of themselves, the world, and the future than did anxious-only and nonaffected children. Further, most children were correctly classified diagnostically based on their CTI-C scores.

Thus, several childhood studies have examined constructs related to Beck's (1967, 1987) theory. It should be highlighted that the negative cognitions assessed by the CBQC, CNCEQ, and CTI-C differ from depressogenic schemata. Procedurally, the CBQC and CNCEQ assess cognitions that arise in response to a negative event, whereas depressogenic schemata pre-exist to direct information processing of such events, resulting in the negative cognitive errors and distortions based on the event. Depressogenic schemata influence one's information processing to produce the negative

themes that yield the cognitive biases and errors assessed by the CBQC and CNCEQ. Thus, while important constructs, these negative cognitive errors and biases should not be equated with depressogenic schemata in explaining the etiology of childhood depression according to Beck. Further, as noted above and in line with the causal mediation component of Beck's theory, the negative cognitive triad assessed by the CTI-C is hypothesized to mediate the relationship between the depressogenic schemata × stress interaction and increases in depressive symptoms.

Cross-Sectional Research of Diathesis-Stress Theories in Children

The advent of measures of children's depression-related cognitions that fall within the scope of Beck's (1967, 1987) theory has lead to attempts to test diathesisstress hypotheses that emulate research found in the adult literature. Using a crosssectional design, Cole and Turner (1993) examined diathesis-stress interactions in children in grades four, six, and eight. While support was found for models in which both cognitive errors as assessed with the CNCEQ (Leitenberg et al., 1986) and attributional style as measured with the Children's Attributional Style Questionnaire (CASQ; Seligman, Peterson, Kaslow, Tanenbaum, Alloy, & Abramson, 1984) mediated the relationship between peer-rated competency and depression, little support was found for moderational models that examine diathesis-stress interactions. Specifically, cognitive errors only marginally moderated the effect of positive and negative events on depression.

In another cross-sectional study using the CNCEQ and CASQ, Turner and Cole (1994) hypothesized that cognitive diatheses for depression may emerge with age. They claimed that a failure to consider cognitive-developmental changes in cognitive diathesis-stress theories of depression is a critical oversight. While younger children's cognitions may be linked to present events and feedback, the researchers postulate that not until late childhood and early adolescence does one have the capacity to establish a stable vulnerability to depression. In line with predictions, only in eighth-grade children (and not in those in grades four and six) did results consistent with diathesis-stress models of depression emerge. The authors maintain that only with the development of formal operational thought and abstract reasoning may cognitions moderate the impact of negative events on children's levels of depression.

In sum, cross-sectional research has examined diathesis-stress theories of depression in children, including an examination of some Beckian constructs (e.g., cognitive errors such as overgeneralization). However, these investigations have not tested depressogenic schemata as a vulnerability to depression as theorized by Beck (1967, 1987). Importantly, the study completed by Turner and Cole (1994) did adopt a developmental psychopathological stance in acknowledging the role of normative cognitive development when examining cognitive theories of depression in children.

Longitudinal Research of Diathesis-Stress Theories in Children

Despite these aforementioned efforts, there seems to exist no longitudinal research that has explicitly examined whether depressogenic schemata moderate the impact of negative life events on children's depression. Again, this is likely due to the lack of a validated measure of such schemata for use in children. To be sure, much longitudinal research that offers ideal examinations of diathesis-stress theories has been conducted with children, but none that addresses the theory of Beck (1967, 1987). The vast majority of this research has focused on the construct of attributional style as a cognitive vulnerability to depression.²

Nolen-Hoeksema, Girgus, and Seligman (1986) tested the reformulated learned helplessness theory of depression (Abramson, Seligman, & Teasdale, 1978) over one year in third- through fifth-grade children and found that explanatory style interacted with negative events to predict future levels of depression. In a six-month study of children aged 8 to 16 years who were deemed to be at high risk for depression due to the presence of maternal affective disorders, Hammen, Adrian, and Hiroto (1988) found no attributional style × life stress interaction that predicted affective disorders. Rather, a diathesis-stress interaction was found predictive of nonaffective disorders. A six-month study by Hammen (1988) examining the interactions between both self-concept (Piers & Harris, 1969) and self-schemas (Hammen & Zupan, 1984) and negative events revealed no self-concept × stress interaction or self-schema × stress interaction that predicted affective diagnoses. The self-concept × stress interaction did, however, predict nonaffective diagnoses.

² Researchers have examined diatheses beyond attributional style in children. In an examination of interpersonal and achievement orientations and their potential moderational effects on specific stressors in predicting depression, Little and Garber (2000) followed children in grades five and six for three months. The researchers found that, for boys, the congruent diathesis-stress interaction between connectedness as assessed at entry and social stressors as assessed three months later predicted increments in depressive symptoms. In an examination of Linville's (1985, 1987) self-complexity buffering hypothesis, Abela and Véronneau-McArdle (2002) assessed third- and seventh-graders' degrees of self-complexity and followed them for 10 weeks, after which time depressive changes and life events were measured. While high degrees of both total and positive self-complexity did not buffer against the depressive effects of life stress, seventh-grade children with high negative self-complexity who underwent life stress manifested increases in depression levels.

Panak and Garber (1992), in a year-long investigation of children in grades three to five, found that attributional style did not interact with peer rejection to predict increases in depression after seven to eight months. However, a significant interaction was reported at a later assessment such that children with a depressogenic attributional style who experienced the greatest increases in rejection showed the highest levels of depression after one year.

In a five-year investigation, Nolen-Hoeksema, Girgus, and Seligman (1992) followed an initial sample of 508 third-grade children. They found that when children were younger (i.e., in grades three and four), only negative life stress predicted future levels of depression. However, as children aged, attributional style and its interaction with life stress did predict subsequent depressive levels. The authors suggest, as subsequently did Turner and Cole (1994), that only as children grow older do their cognitive abilities sufficiently develop to allow more stable cognitive diatheses to exert an influence on the emergence of depression.

Hilsman and Garber (1995) examined the cognitive diathesis-stress model of depression in fifth- and sixth-grade children using both attributional style and cognitions about academic competence and control as vulnerabilities. The interactions between these diatheses and naturalistic stressors (children's lower than acceptable report card grades, and parental reactions to the grades) were tested to predict changes in future levels of depressive symptomatology and in negative affect. With specific regard to depression as an outcome variable, main effects of children's lower than acceptable grades, parental reactions, and academic cognitions, but not of attributional style, were revealed that predicted depressive levels on the day after receiving report cards. Five

days later, there were no main effects of children's lower than acceptable grades, parental reactions, academic cognitions, or attributional style, as well as no interaction between parental reactions and any cognitive variable to predict depression levels. However, in support of the diathesis-stress hypothesis, the interaction between academic cognitions and lower than acceptable grades, as well as between attributional style and lower than acceptable grades, did predict enduring depressive symptoms six days after the receipt of reports. These results paralleled those of previous researchers (Metalsky, Halberstadt, & Abramson, 1987; Metalsky, Joiner, Hardin, & Abramson, 1993) who found predictive attributional style × stress interactions for enduring, but not for immediate, depressive symptoms in adults.

Robinson, Garber, and Hilsman (1995) followed grade six students through the transition to junior high school. In support of their diathesis-stress hypotheses, the researchers found that the interaction between attributional style before the transition and stressors related to the transition predicted increases in depression levels four to five months later when participants were in grade seven. Further analyses revealed that this interaction was qualified by levels of perceived self-worth, such that only in children with low self-worth did a negative attributional style combine with high stress to result in higher levels of depression. For high self-worth children, greater stress lead to increases in levels of depression irrespective of participants' attributional styles.

In a study of youth psychiatric inpatients aged 9-17 years, Joiner (2000) tested the hopelessness theory of depression (Abramson, Metalsky, & Alloy, 1989) by assessing the attributional style of children upon admission and assessing stress and changes in depression two months later. Results revealed that attributional style

interacted with negative life events to predict increases in depressive, and not anxious, symptoms. Further, in support of the theory's mediation component, hopelessness mediated the relationship between the diathesis-stress interaction and increases in depressive symptoms.

Using a recently developed interview methodology to assess children's attributional styles, Conley, Haines, Hilt, and Metalsky (2001) tested the reformulated helplessness theory of depression (Abramson, Seligman, & Teasdale, 1978) in children aged 5 to 10 years. Children were followed for approximately 3 weeks after the assessment of attributional styles during which time negative life stress was also measured. Consistent with the theory's diathesis-stress predictions, only children with a negative attributional style for positive events and who underwent high degrees of life stress showed increases in levels of depression. Although this effect was qualified by a subtle 3-way attributional style × stress × age interaction, for both older and younger children the pattern of results supported the theory's tenets.

Abela (2001) examined the hopelessness theory of depression (Abramson et al., 1989) by assessing children's depressogenic attributional style, depressogenic inferential style regarding causes, and depressogenic inferential style regarding the self. Children in grades three and seven were followed for six weeks following an initial assessment of the cognitive diatheses, during which time life stressors as well as depression and hopelessness levels were monitored. In line with previous research that found developmental effects in diathesis-stress interactions (Nolen-Hoeksema et al., 1992; Turner & Cole, 1994), only children in grade seven with a depressogenic attributional style who experienced negative life events showed increases in levels of depression. In contrast, all children with a depressogenic inferential style regarding consequences who experienced negative life events showed increased depressive levels, while only girls with a depressogenic inferential style regarding the self who underwent life stress had levels of depression rise. Not supportive of the theory was the finding that none of the three interactions were mediated by hopelessness.

To summarize, numerous investigations have yielded evidence supporting the diathesis of attributional style in predicting the emergence of depression in children. Indeed, the majority of longitudinal diathesis-stress research conducted in child samples addresses the vulnerability of attributional style that moderates the effects of life stress. These studies thus address components of another prominent cognitive theory of depression besides that of Beck (1967, 1987), namely the hopelessness theory of depression (Abramson et al., 1989) and its predecessor, the reformulated learned helplessness theory of depression (Abramson et al., 1978). These theories differ from Beck's (1967, 1987) theory in their attention to attributional style rather than to dysfunctional attitudes as the vulnerability to depression.

Differentiating Dysfunctional Attitudes from Attributional Style

While a sizeable body of research has tested diathesis-stress theories of depression in children using more stringent longitudinal methodologies, to reiterate, there appears to be no child-based research that has been reported that specifically examines Beck's (1967, 1987) theory of the etiology of depression. It is important to consider whether the research that examines attributional style as a cognitive diathesis in children renders research that examines dysfunctional attitudes redundant. Previous

investigations have shed light on this concern and have differentiated the constructs of attributional style and dysfunctional attitudes.

The correlation between attributional style and dysfunctional attitudes varies from .29 (Lewinsohn et al., 2001) in adolescents to .52 (Spangler, Simons, Monroe, & Thase, 1997) in adults. Typically, the correlation lies between .30 and .40, reflecting a shared common variance between the constructs that is relatively small (Lewinsohn et al., 2001). This suggests that the two constructs are discriminantly valid. Further supporting the divergent validity of dysfunctional attitudes relative to attributional style are factor analyses in both adult and adolescent samples that have suggested that dysfunctional attitudes and attributional style load onto distinct factors (Gotlib, Lewinsohn, Seeley, Rohde, & Redner, 1993; Joiner & Rudd, 1996; Spangler et al., 1997).

Further differentiating the constructs of dysfunctional attitudes and attributional style is the finding that the Beckian and Hopelessness theories of depression refer to unique subsets of depressed individuals in adult research (Spangler et al., 1997). Also of note is the fact that the theories, while both diathesis-stress in nature, predict diverse proximal causes of depression that act as mediators between the diathesis-stress interactions and changes in levels of depression. This relationship is mediated by hopelessness according to the hopelessness theory (Abramson et al., 1989), and, as mentioned, by the negative cognitive triad in Beck's (1967, 1987) theory.

It is therefore evident that the value of examining whether dysfunctional attitudes moderate the impact of life events on children's level of depression is not undermined by previous longitudinal attributional style research. Instead, diverse

diathesis-stress interactions must be specifically tested using appropriate methodologies adopted from studies that address whether constructs such as attributional style moderate the impact of stress on the emergence of depression.

Incorporating Normative Cognitive Development into Cognitive Theories of Depression

Developmental psychopathologists (e.g., Cicchetti & Schneider-Rosen, 1984, 1986; Cicchetti & Toth, 1998; Digdon & Gotlib, 1985; Garber, 1992, 2000) have long questioned the conventional separation of developmental psychology and psychopathology. As an illustration of this separation, adult conceptualizations of depression (e.g., diagnostic criteria, etiological theories) might be applied to children without sufficient consideration of the requisite psychological, physical and social foundations to warrant their application. In contrast to this separation, the field of developmental psychopathology takes into account normative physical, social, and psychological development and how these progressions may affect the manifestation of psychological disorders. Within the last two decades an awareness has begun to develop regarding the developmental issues that must be considered when applying theories of psychopathology across the lifespan. With regard to cognitive theories of depression such as that of Beck (1967, 1987), one must consider normative cognitive development to determine the applicability of such theories to younger populations.

The theory of Piaget (Flavell, 1963; Inhelder & Piaget, 1958; Piaget, 1967) is the most widely studied and influential theory of cognitive development. Piaget conceptualized cognitive development as occurring in a series of periods characterized by qualitatively diverse abilities. Following birth, cognitive development begins with

the sensorimotor period (approximately 0-2 years) when the infant develops knowledge of the world by physically and perceptually interacting with it via motor actions and sensory faculties. In the subsequent preoperational period (approximately 2-7 years) the child is able to move beyond sensorimotor inputs and outputs and can understand the world representationally (e.g., with symbols, words, or drawings). However, thinking is still limited by patterns such as egocentrism, a lack of reversibility, and a focus on superficial appearance rather than reality.

In the concrete operational period (approximately 7-11 years), cognition "remains essentially attached to empirical reality" (Inhelder & Piaget, 1958, p. 250) and children who are concrete operational thinkers thus exhibit difficulty in addressing hypothetical or possible scenarios that are not concretely present or palpably real. In contrast, as children progress to a more formal operational period of cognition (11-12 years and onward) they become capable of hypothetico-deductive thinking that moves beyond concrete limitations and addresses the realm of abstract or possible scenarios without the support of perception or experience (Piaget, 1967). Formal operations "provide thinking with an entirely new ability that detaches and liberates thinking from concrete reality and permits it to build its own reflections and theories." (Piaget, 1967, p. 63). Since depressogenic schemata are defined as stored bodies of subjective knowledge that direct information processing, they also may be conceptualized as representing subjective reflections and theories that are built and abstracted from one's environment. Thus, a parallel between depressogenic schemata and the "freed-fromreality" reflections and theories of formal operational thought is evident. Moreover, Piaget (1967, p. 62) noted that formal operational thought was expressed in "some kind of language (words, mathematical symbols, etc.)" that freed it from the constraints of reality. Building on this, Siegler (1986, p. 41) stated that only with formal operational thought can a child engage in "reasoning in sophisticated ways about contrary-to-fact propositions ('If people could know the future, would they be happier than they are now?')". The comprehension and processing of hypothetical, abstract information that has little basis in reality is the hallmark of formal operational thought. Given that depressogenic schemata are expressed linguistically as hypothetical, abstract, and contrary-to-fact propositions, it follows that only formal operational thinkers should be able to functionally process such propositions, such as those inherent in items of the DAS, or in items of a measure of depressogenic schemata designed for younger populations.

An awareness of cognitive-developmental theory is not absent in cognitive diathesis-stress research. For example, Digdon and Gotlib (1985) noted that, with regard to cognitive theories of depression such as that of Beck (1967, 1987), one must examine whether children possess the requisite cognitive skills to form the diatheses in question. Garber (1992) highlighted the need to make methods of testing theories of depression in children developmentally sound, operating within the recognized limits of their cognitive and linguistic capacities. Garber (2000) as well as Garber and Flynn (2001) discussed the role of the Piagetian theory of cognitive development in the etiology of depression, and noted that young, concrete thinkers tend to respond to their immediate environment, while older children have the capacities to process more abstract constructs such as hopelessness. Research findings supportive of

developmental effects in diathesis-stress research as previously discussed (Abela, 2001; Nolen-Hoeksema et al., 1992; Turner & Cole, 1994) emphasize the importance of incorporating cognitive-developmental factors into the formulation of researchers' hypotheses when testing diathesis-stress theories in children.

Present Studies

The empirical support for Beck's theory in adults and adolescents (Abela & D'Alessandro, 2002; Dykman & Johll, 1998; Joiner et al., 1999; Kwon & Oei, 1992; Lewinsohn et al., 2001) led to the current question of whether depressogenic schemata may also act as a cognitive vulnerability to depression in children. Given the development of appropriate methodologies to test diathesis-stress interactions in the adult and children's literatures, as well as the requirement to explicitly test theories across the lifespan (Cicchetti & Toth, 1998; Digdon & Gotlib, 1985; Garber & Flynn, 2001) two studies were designed to test Beck's (1967, 1987) cognitive theory of the emergence of depression in children. The purpose of these present studies is to further extend research into Beck's theory to school-aged samples.

Briefly, a principal goal was to develop and validate the Child and Adolescent Dysfunctional Attitudes Scale (CADAS), a self-report measure of depressogenic schemata for children, since no such instrument is currently available. To facilitate the development of the CADAS, the DAS (Weissman, 1979; Weissman & Beck, 1978) was employed as a guide in the generation of items that were more suitable for young populations. Items from the DAS were significantly restructured and subsequently retained or omitted (based on redundancy with other items, inapplicability to children, or
potential comprehension difficulties) to form a preliminary item pool. This initial pool of 40 items was examined in terms of psychometric properties using both scale development and replication samples of children. Divergent validity of the CADAS was also examined relative to relevant constructs.

Following the psychometric validation of the CADAS, and incorporating cognitive-developmental theory, Beck's (1967, 1987) theory of the etiology of depression was examined using a short-term longitudinal design modeled after that of Hilsman and Garber (1995). Would depressogenic schemata, as measured with the CADAS, interact with subsequent naturalistic stressors (parental reactions to report cards and children falling short of their grade aspirations) to predict immediate and enduring changes in levels of depression in children? It was hypothesized that dysfunctional attitudes would interact with stressors to predict changes in levels of depression, after controlling for initial levels of symptomatology. In line with a developmental-psychopathological perspective, it was further hypothesized that this interaction would hold only in older children (11-12 years and up), who were conceptualized as having the formal operational cognitive ability to process the abstract, hypothetical themes inherent in depressogenic schemata. Last, the causal mediation component of Beck's theory was tested. It was thus hypothesized that the relationship between the depressogenic schemata \times stress interaction and changes in levels of depression would be mediated by specific components of the negative cognitive triad, that is, by negative views of the self, of the world, and of the future.

27

Study 1: Development and Psychometric Validation of the Child and Adolescent Dysfunctional Attitudes Scale

Study 1 sought to develop and validate the Child and Adolescent Dysfunctional Attitudes Scale (CADAS). The steps taken to develop the instrument are described. The items for the CADAS were derived from items from the DAS (Weissman, 1979; Weissman & Beck, 1978). The DAS items were significantly restructured in order to facilitate their comprehension in younger samples. Following a preliminary examination of the linguistic difficulty of the items, a large sample of elementary school children completed the CADAS item pool. As well, children completed other instruments to assess the divergent validity of the CADAS relative to constructs such as depression, positive affect, negative affect, a negative view of the self, of the world, and of the future, dependency, self-criticism, neuroticism, self-esteem, and social desirability. The stability of the cOADAS three weeks after the first administration.

Primary objectives included that the finalized CADAS would be of acceptable internal consistency, and also that it would demonstrate adequate test-retest reliability as an index of stability, following the elimination of items based on psychometric performance. Importantly, the factor structure of the CADAS was also examined. Further, the divergent validity of dysfunctional attitudes in children was tested relative to other depression-related constructs and nondepression-related constructs that are key in test development (e.g., social desirability). It was expected that children's dysfunctional attitudes would be moderately positively correlated with depression, negative affect, negative views of the self, of the world, and of the future, dependency, self-criticism, and with neuroticism. In contrast, it was hypothesized that dysfunctional attitudes would be moderately negatively correlated with positive affect and with self-esteem. The relationship between socially desirable response tendencies and children's reported levels of dysfunctional attitudes was also examined.

Method

Participants

The scale validation sample consisted of 453 children (48.8% female) attending four Catholic elementary schools in Toronto, Canada. Grade distribution was as follows: 11 children were in grade three, 100 in grade four, 69 in grade five, 111 in grade six, 32 in grade seven, and 130 in grade eight. (Many elementary schools in the Toronto-area educate children from kindergarten through grade eight.) The mean age of participants was 142.32 months (SD = 18.93). All participants were fluent English speakers. Since, as is common in the Toronto area, a large proportion of the children came from families whose previous generations had recently immigrated into Canada, children were asked to indicate from which country their family originated before coming to Canada. Ethnicity was distributed as follows: 5.9% North American, 7.9% South American, 2.4% Central American, 21.6% Caribbean, 14.5% European, 1.3% East Asian, 24.2% Southeast Asian, 2.9% African, 1.5% Middle Eastern, and 15.2% from the Indian Subcontinent. No ethnicity was identified by 2.6% of participants. The study was conducted in Spring, 2001.

Measures

Preliminary item pool for the Child and Adolescent Dysfunctional Attitudes Scale (D'Alessandro & Abela, 2001). Since it could not be assumed that the more complex structure of the adult DAS (Weissman, 1979; Weissman & Beck, 1978) would be suitable for children, the initial stage in developing the CADAS was the generation of a preliminary item pool. The 100-item DAS was used as a basis to this end. Given that it was not clear that children as young as third graders would be able to comprehend DAS items that were originally intended for older populations (e.g., "People should have a reasonable likelihood of success before undertaking anything.", or, "If I am to be a worthwhile person, I must be truly outstanding in at least one major respect."), the items from the original DAS were modified to make them more comprehensible to children. Specifically, items were shortened (e.g., "It is not necessary to stop myself from doing something for my own welfare simply because it might displease another person." was changed to "I can do what I want even though other people might not like it."). The more advanced DAS vocabulary was replaced with a more rudimentary one (e.g., "I have to impress new acquaintances with my charm, intelligence, or wit or they won't like me." was changed to "You have to impress other kids for them to like you."). Sentence structure was also simplified (e.g., "I can find greater enjoyment if I do things because I want to, rather than in order to please other people." was changed to "It is more fun to do things I want to do than what other people want.").

Since it was felt that the psychometric validation of a 100-item scale would be an overly taxing endeavor for participating children, the item pool was pruned. After eliminating items that were judged to be redundant with other items (e.g., "If other

people don't like you, you cannot be happy." and "I can only be happy if most people I know like me."), those that were less directly applicable to children (e.g., "I can get what I want even though I do not work, work, work all the time."), and those that continued to be problematic in terms of comprehension (e.g., "A person can change how happy or sad they are when something happens even though their feelings might hurt them."), 40 items remained.

The remaining items were then read by an independent sample of 66 children (30 females) with a mean age of 122.16 months (SD = 17.64). Children were individually asked to indicate if there were any items that they did not understand well. No members of this preliminary sample reported difficulties in comprehending any of the items. Therefore, this 40-item CADAS pool was administered to the larger (N = 453) validation sample. Participants responded using a 6-point Likert scale (1 = Strongly disagree, 2 = Mostly disagree, 3 = Disagree a bit, 4 = Agree a bit, 5 = Mostly agree, 6 = Strongly agree).

Children's Depression Inventory (CDI; Kovacs, 1980-1981, 1985). The CDI is a 27-item self-report scale designed for schoolchildren and adolescents that assesses the affective, physical, cognitive, and behavioral symptoms of depression. For each item, children are asked to select a sentence from a group of three that best describes how they have been feeling over the last two weeks (e.g., "I feel like crying every day.", or "I feel like crying many days.", or "I feel like crying once in a while."). A score of 0, 1, or 2 is given for each item, with higher scores representing greater levels of depression. Internal consistency of the CDI is good, with coefficient alphas ranging from .86 to .94 (Kovacs, 1980-1981; Saylor, Finch, Spirito, & Bennett, 1984). Test-retest reliabilities for the CDI vary from .72 over one month (Kovacs, 1980-1981) to .87 over one week (Saylor et al., 1984). At the request of participating school boards and principals, one item (Item 9) that assesses suicidality was omitted from the measure. Thus, possible raw scores range from 0 to 52. Coefficient alpha for the 26-item CDI in the current sample was .84.

Positive and Negative Affect Scale for Children (PANAS-C; Laurent, Catanzaro, Joiner, Rudolph, Potter, Lambert, Osborne, & Gathright, 1999). The PANAS-C is a 27-item self-report instrument that assesses levels of positive and negative affect in schoolchildren that is an adaptation of the PANAS that was designed for use in older populations (Watson, Clark, & Tellegen, 1988). Each item requires children to read a word describing a feeling or emotion (e.g., happy, calm, sad, gloomy) and to indicate to what extent they have felt that way over the past few weeks on a 5-point Likert scale (1= *Very slightly or not at all*, 2 = A *little*, 3 = Moderately, 4 = Quite a bit, 5 = Extremely). Higher scores represent greater levels of affect. The negative affect (NA) subscale contains 15 items, while the positive affect (PA) subscale contains 12 items given Laurent et al.'s recommendation for the exclusion of three PA items due to poor psychometric properties. Thus, possible raw scores for the PA and NA scales range from 12 to 60 and 15 to 75, respectively. Coefficient alphas of the PA and NA subscales range for m.87 to .89 and .92 to .94, respectively. In the current sample, respective alphas for the PA and NA scales were .86 and .88.

Cognitive Triad Inventory for Children (CTI-C; Kaslow, Stark, Printz, Livingston, & Ling Tsai, 1992). The CTI-C is a 36-item self-report scale designed to measure levels of depressive cognitions that form Beck's (1967) negative cognitive

triad. Twelve items assess each component of the triad, specifically a negative view of the self (e.g., "I am a failure."), a negative view of the world (e.g., "Bad things happen to me a lot."), and a negative view of the future (e.g., "There is nothing left in my life to look forward to."). Participants respond on a 3-point Likert-type scale (1 = Yes, 2 = Maybe, 3 = No) according to their current thoughts, with higher scores coded to represent increasingly negative views of the triad's components. Thus, possible raw subscale scores range from 12 to 36. Internal consistency (alpha) for the subscales ranges from .69 to .85 (Kaslow et al.). In the current sample, coefficient alphas for the negative view of the self, world, and future subscales were .79, .73, and .79, respectively.

Shortened version of the Depressive Experiences Questionnaire for Adolescents (DEQ-A; Fichman, Koestner, & Zuroff, 1994). The short form of the DEQ-A is a 20item adaptation of the original 66-item DEQ-A (Blatt, Schaffer, Bers, & Quinlan, 1992) that assesses levels of the depressive styles of dependency and self-criticism using a self-report format. The short form of the DEQ-A consists of the eight items that had the greatest factor loadings on each of the dependency (e.g., "I have difficulty breaking off a friendship that is making me unhappy.") and self-criticism (e.g., "There is a big difference between how I am and how I wish I were.") factors. Four items that loaded most highly on a factor that assesses efficacy are also included but were not of interest in the current validation study. The dependency and self-criticism subscales of the abbreviated DEQ-A have acceptable alpha coefficients of .70 and .65 respectively and correlated strongly with their full-length DEQ-A counterparts (Fichman et al.). Children respond to each item with a 4-point Likert scale (1 = Really true of me, 2 = Sort of true of me, 3 = Not very true of me, 4 = Not at all true of me). Responses were coded such that higher scores represented greater levels of the depressive styles. Thus, raw scores for each subscale had a possible range of 8 to 32. In the current sample, coefficient alpha for the dependency subscale was .71, while for the self-criticism subscale alpha was .53.

Rosenberg Self-Esteem Scale (SES; Rosenberg, 1965). The SES is a 10-item self-report measure that assesses general feelings of self-acceptance and self-worth. Some items of the SES were slightly modified to facilitate increased vocabulary comprehension in a child sample (e.g., "On the whole, I am satisfied with myself." was modified to "Overall, I am satisfied with myself."). Reports of internal consistency (coefficient alpha) range from .77 to .88 (Dobson, Goudy, Keith, & Powers, 1979; Fleming & Courtney, 1984). Test-retest reliability has ranged from .82 to .85 (Fleming & Courtney; Silber & Tippett, 1965). Children responded to each item using a 4-point Likert-type scale (1 = *Strongly disagree*, 2 = *Disagree*, 3 = *Agree*, 4 = *Strongly agree*), resulting in possible raw scores from 10 to 40 coded such that higher scores represented greater levels of self-esteem. The current sample yielded an alpha coefficient of .77.

Neuroticism Subscale of the Big Five Personality Questionnaire - Revised Child Version (BFPQ-N; Lanthier, 1993, 1999). The BFPQ-N is a 12-item self-report measure of neuroticism extracted from the full BFPQ that assesses four additional personality traits in children (i.e., extraversion, agreeableness, conscientiousness, and openness to experience). The BFPQ was developed to assess levels of the Big Five personality traits in child samples as previously examined in older populations by Goldberg (1990) and McCrae and Costa (1987). Each item of the neuroticism subscale requires children to respond to a question (e.g., How anxious do you think you are?") on a 5-point Likert-type scale (1 = Hardly at all, 2 = A little bit, 3 = Somewhat, 4 = Verymuch, 5 = Extremely). Possible raw scores thus range from 12 to 60 and were coded such that higher scores indicated greater neuroticism. Coefficient alpha for the BFPQ-N has ranged from .71 to .82, while test-retest reliability was reported as .61 (Lanthier, 1999). The alpha coefficient in the current sample was .63.

Children's Social Desirability Scale (CSDS; Crandall, Crandall, & Katkovsky, 1965). The CSDS is a 48-item self-report instrument that assesses children's tendency to respond in a socially acceptable manner or to fear disapproval by others. Each item (e.g., "I tell a little lie sometimes.") is answered using a True/False response format, although a Yes/No format also exists. Previous research (Brannigan, 1974) has indicated that both response formats yield comparable results. The CSDS's internal consistency is good as indicated by the split-half reliabilities reported that range from .82 to .95, while the one-month test-retest reliability is .85 (Crandall et al.). Possible raw scores range from 0 to 48, with higher values reflecting an increased tendency to respond in a socially desirable manner. Coefficient alpha in the current sample was .92.

Procedure

Following approval of the study by the relevant school boards and principals, consent forms were forwarded to parents of potential participants. The rate of parental consent was 83.9%. Children with consent were visited in their classrooms by two to three researchers, with teachers remaining in the classroom during the assessment. Questionnaires were presented in a package format. Students completed a questionnaire package while seated at their individual desks. Each item of every measure was read aloud by one researcher who stood at the front of the classroom. Following the reading of the item, children responded to it on their own copy of the questionnaires. This method of presentation allowed the classes (each composed of approximately 20 members) to answer the items at a comfortable pace and to complete the assessment together.

All participants completed the CADAS item pool, the CDI (Kovacs, 1980-1981, 1985), the PANAS-C (Laurent et al., 1999), the CTI-C (Kaslow et al., 1992), as well as a cover page assessing demographic information. To reduce the duration of this assessment, and to make it more feasible given the time constraints of working within the schools' schedules, the shortened DEQ-A (Fichman et al., 1994), the SES (Rosenberg, 1965), the BFPQ-N (Lanthier, 1993, 1999), and the CSDS (Crandall et al., 1965) were each administered to one quarter of the classrooms visited. This decision was based on the inclusion of these instruments primarily to determine the divergent validity of the CADAS relative to these other constructs. Thus, the DEQ-A, SES, BFPQ-N, and CSDS were completed by 118, 102, 105, and 128 children, respectively. Between classrooms, the order of the questionnaires was randomized, with the exception of the DEQ-A, SES, BFPQ-N, and CSDS, which were always completed last.

All classrooms were re-visited three weeks following the initial assessment to assess the test-retest reliability of the CADAS. During this re-assessment, 431 children (95.1% of the sample) completed the item pool for the CADAS as well as other instruments that were not part of the current study.

36

Results and Discussion

CADAS Item Selection and Psychometric Properties

Selection of final items for the CADAS proceeded over several stages. Following an examination of each item's distribution of response tendencies, corrected item-total correlations were computed for each of the 40 CADAS items. Although Streiner and Norman (1989) suggested the retention of items with corrected item-total correlations greater than .20, the more conservative criterion of .30 that other scale developers have followed (e.g., Laurent et al., 1999) was employed herein. Using this more stringent threshold, ten items were selected for removal.

Since much of the diathesis-stress research that employs the DAS (Weissman, 1979; Weissman & Beck, 1978) treats the construct of dysfunctional attitudes as a unidimensional construct, an exploratory principal components analysis (PCA) was subsequently conducted to examine the factor structure of the CADAS item pool. In line with the guidelines of Clark and Watson (1995), the extraction of five factors was requested with no rotation to simple structure. Since a unidimensional instrument was sought, the resulting factor loading matrix was reviewed to determine candidates for removal. Specifically, items with factor loadings below .40 on the first factor, conceptualized as the factor representing the construct of general dysfunctional attitudes, were marked for deletion. Sixteen such items were identified, ten of which were already identified for deletion by virtue of their behavior in corrected item-total correlations. Items with factor loadings greater than .40 on later factors were also considered to be candidates for removal since they were conceptualized as representing constructs outside of general dysfunctional attitudes. Six such items were identified,

four of which had already been marked for deletion by virtue of their corrected itemtotal correlations or their behavior on the first PCA factor.

Thus, 18 items were identified as candidates for removal from the CADAS. Next, new corrected item-total correlations were computed with the remaining 22 items. The results are presented in Table 1. All items exceeded the .30 criterion (the range of corrected item-total correlations was .39 to .53). A second factor analysis was then conducted, thus subjecting the retained 22 items to a PCA where five factors (Clark & Watson, 1995) were requested. Results of this analysis are presented in Table 1. All items met the criterion of loading greater than .40 on the first factor (loadings ranged from .43 to .61). All items except four had factor loadings less than .40 on the second and subsequent factors (the four items that loaded on the second factor greater than .40 all had negative loadings). An examination of eigenvalues, also presented in Table 1, supports a unidimensional solution. Although some psychometricians suggest the retention of factors with eigenvalues greater than 1.00 (the Kaiser-Guttman criterion), others (e.g., Zwick & Velicer, 1986; see also Floyd & Widaman, 1995) suggest that an inspection of the scree plot of eigenvalues may avoid the retention of superfluous factors. Since the slope of the scree plot approximated a horizontal after the first eigenvalue, it was concluded that a unidimensional CADAS structure was acceptable.

The one-factor solution accounted for 27.37% of the item variance, a figure that is acceptable given the item-level of analysis. This proportion of the variance accounted for is comparable to that demonstrated in other scale validation factor analyses. A unidimensional model was thus adopted for the 22 final items of the CADAS. These items are presented in Appendix A. Since, as part of the second study of the current program of research, the 22-item CADAS was administered to an independent sample of 241 children, the psychometric properties of the scale were reanalyzed with this new group of participants. As seen in Table 1, the items of the CADAS again performed well psychometrically in this replication. One item (Item 4) fell slightly below the more conservative item-total correlation criterion of .30 but still met the .20 criterion (Streiner & Norman, 1989), and loaded less than .40 on the first factor of the PCA. Overall, the psychometric properties of the CADAS items were good in both the original and replication samples.

Internal consistency of the 22-item CADAS was also highly acceptable. Coefficient alpha was .87 (.85 in the replication sample). However, in light of the debate regarding the suitability of coefficient alpha as an index of internal consistency (e.g., problems related to the inflation of alpha as the length of the measure increases; see Clark & Watson, 1995; Schmitt, 1996), the recommendations of Clark and Watson were implemented by computing the mean inter-item correlation for the final CADAS items. This alternative index of internal consistency was .24 (.22 in the replication sample), thus falling in the acceptable range of greater than .15. Importantly, the threeweek test-retest reliability of the 22-item CADAS was .80, indicating, as hypothesized, that childhood dysfunctional attitudes tend to be temporally stable in nature.

Divergent Validity

A key step in the validation of the CADAS was to examine if dysfunctional attitudes in children were indeed a unique construct relative to other constructs that have been assessed in this population. To determine the divergent validity of the CADAS, Pearson product-moment correlations were computed between the finalized CADAS and constructs from which divergent validity should be demonstrated. Table 2 presents these correlations, as well as the intercorrelations between all measures and their descriptive statistics.

As predicted, moderate positive correlations were revealed between CADAS scores and depression (r = .30), negative affect (r = .29), negative views of the self (r = .41), of the world (r = .23), and of the future (r = .31), self-criticism (r = .32), and neuroticism (r = .26). Also as predicted, self-esteem was moderately negatively correlated with dysfunctional attitudes (r = .58), this being the correlation of the largest magnitude. All of the above correlations were significant at an alpha level of .01.

Importantly, the tendency to respond in a socially desirable manner was unrelated to levels of dysfunctional attitudes (r = .15, p = .09). Contrary to predictions, however, dysfunctional attitudes were uncorrelated to positive affect (r = .08, p = .11), and were likewise uncorrelated to dependency (r = .06, p = .56). Despite these two null findings, the pattern of correlations suggests that the construct of children's dysfunctional attitudes is not redundant with other depression-related constructs. Rather, the CADAS appears to assess a relatively differentiated construct that shares only a limited variance with other measures.

Summary

To review, these results indicate that the 22-item CADAS has good internal consistency as assessed by corrected item-total correlations, co-efficient alpha, and mean inter-item correlations. The scale demonstrates good test-retest reliability, while

factor analyses support the unidimensionality of the CADAS. The CADAS also performs well with regard to divergent validity. Relative to other constructs related to depression in particular and to psychopathology in general, as well as relative to socially desirable response tendencies, the results suggest that the CADAS assesses a differentiated construct. Study 2: Construct Validity of the CADAS – Testing the Diathesis-Stress and Causal Mediation Components of Beck's Theory, and the Developmental Hypothesis, in Children

Following the development and psychometric validation of the CADAS, hypotheses generated from Beck's (1967, 1987) cognitive theory regarding the etiology of depression were tested. These hypotheses were incorporated with knowledge garnered from the fields of developmental psychology and developmental psychopathology. To this end, a methodology similar to that used by Hilsman and Garber (1995) was employed. Thus, a short-term longitudinal study was conducted that centred around a naturalistic potential stressor experienced by all participants, namely the receipt of report cards.

One week before the receipt of report cards, elementary school children from 7 to 14 years of age completed the validated CADAS and a baseline measure of depressive symptoms. Children were also asked to indicate their subjective lowest acceptable report card grades in core academic subject areas. Immediately following the receipt of report cards, changes in levels of depression were assessed, as were two potential stressors: parents' reactions to their own children's grades, and the discrepancy between subjective acceptable grades and actual report card grades. Changes in depression levels were reassessed five days after the children received their grades.

It was hypothesized that dysfunctional attitudes would interact with stressors to predict changes in levels of depression, after controlling for initial levels of symptomatology. It was predicted that only children who endorse high levels of dysfunctional attitudes and who also experience a stressful report card outcome would exhibit increases in depressive symptomatology, both immediately after and five days after the stressor's occurrence. In line with a developmental-psychopathological perspective, it was further predicted that this interaction would hold only in older children (11-12 years and up) who were conceptualized as having the formal operational cognitive ability to process the abstract, hypothetical themes inherent in depressogenic schemata. No such interaction was foreseen in younger, preformal operational children.

Additionally, the causal mediation component of Beck's (1967, 1987) theory was examined. It was predicted that the relationship between the depressogenic schemata × stress interaction and changes in levels of depression would be mediated by specific components of the negative cognitive triad, that is, negative thoughts of the self, of the world, and of the future. Thus, it was hypothesized that children who endorsed high levels of dysfunctional attitudes and who also underwent a stressful report card experience would exhibit greater increases in depressive symptomatology relative to their peers because they held a negative view of themselves, of their environment, and of their future that acted as proximal and sufficient causes of depression.

Method

Participants

The construct validity study consisted of an independent sample of 241 elementary school children (52.7 % female) frequenting two Catholic schools in

Toronto, Canada.³ The mean age of children was 135.66 months (SD = 19.95).

Nineteen of the children were in grade three, 44 in grade four, 35 in grade five, 46 in grade six, 32 in grade seven, and 65 were in grade eight. All participants were fluent English speakers. As in Study 1, children were asked to indicate their family's country of origin before arriving in Canada. Ethnicity was thus distributed as follows: 3.7% North American, 4.6% South American, 0.4% Central American, 19.1% Caribbean, 15.8% European, 0.4% East Asian, 32.4% Southeast Asian, 2.9% African, 0.8% Middle Eastern, and 16.2% from the Indian Subcontinent. No ethnicity was disclosed by 3.7% of participants. The study was conducted in Fall, 2001.

Measures

Child and Adolescent Dysfunctional Attitudes Scale (CADAS). As discussed in Study 1, the CADAS is a 22-item self-report measure designed to test Beck's (1967, 1987) cognitive diathesis-stress theory of depression in young populations. The instrument assesses levels of dysfunctional attitudes (e.g., "If I need help, it means that I am dumb.") in school-aged children. The CADAS has respectable internal consistency, an acceptable factor structure, and good test-retest reliability and divergent validity as reported in Study 1. As noted, coefficient alpha in the current sample was .85. The CADAS is presented in Appendix A.

Children's Depression Inventory (CDI; Kovacs, 1980-1981, 1985). The CDI is a 27-item self-report instrument that assesses levels of affective, cognitive, physical, and

³ Of the N = 268 at Time 1, 11 participants were absent at Time 2, and 14 more were absent at Time 3. Two children received no report card since they only recently began frequenting their respective schools. Analyses were conducted on the remaining 241 children whose data were complete.

behavioral depressive symptomatology. The CDI has good psychometric properties as reported in Study 1. Again, item 9 that assesses suicidality was not included at the request of the school boards. The mean coefficient alpha over the repeated CDI administrations in this sample was .88.

Cognitive Triad Inventory for Children (CTI-C; Kaslow, Stark, Printz, Livingston, & Ling Tsai, 1992). The CTI-C is a 36-item self-report scale designed to measure levels of depressive cognitions that form Beck's (1967) negative cognitive triad. Twelve items assess each of negative views of the self, of the world, and of the future, as described, along with the scale's psychometric properties, in Study 1. In the current sample, mean coefficient alphas across repeated administrations of the CTI-C for the negative view of the self, of the world, and of the future subscales were .85, .78, and .86, respectively.

Parental Reaction Questionnaire (PRQ; Hilsman & Garber, 1995). The PRQ is a 20-item self-report scale that assesses children's reports of their parents' reactions to their report cards. Examples of items, to which children respond in a True/False format, are "My parents were angry at me for my report card." and "My parents really liked my report card.". One item was omitted from the PRQ that referred to siblings since it was not known if this item would apply to all children in the sample. Congruent with the work of Hilsman and Garber (1995), positively worded items were reversed and summed with negatively worded items to create a total parental stress score whereby higher values indicated an increasingly negative parental reaction. Hilsman and Garber reported a high internal consistency for the PRQ with a coefficient alpha of .93. In the

45

current study, coefficient alpha was .92 and the mean inter-item correlation was good at .38.

Grade deficit score (GRDEF). Similar to previous research that focused on the potentially negative effects of evaluative academic stressors (e.g., Brown, Hammen, Craske, & Wickens, 1995; Hilsman & Garber, 1995; Joiner, Metalsky, Lew, & Klocek, 1999; Metalsky, Joiner, Hardin, & Abramson, 1993), a grade deficit score was computed for each child. Prior to the receipt of report cards, children were asked to indicate their lowest acceptable grade in six core academic subjects. These grades were converted to a 13-point scale (A+ = 13, F = 1). Children's actual report card grades were then obtained from school records (with parental and school board consent) and converted to the same 13-point scale. Actual grades were subtracted from acceptable grades to obtain a grade deficit score for each academic subject, and these values were summed across academic subjects to create a more comprehensive grade deficit score. Table 3 presents an example of the calculation of this measure, with higher values reflecting an increasingly negative report card outcome.

Similar to previous research examining diathesis-stress theories of depression in children (e.g., Hilsman & Garber, 1995), the PRQ and grade deficit score were both included as assays of stress since it could not be assumed that children's perceptions of their academic performance would be comparable to parents' perceptions of their children's performance. The measures of the two stress sources were correlated only moderately at .39. This suggested that each index tapped a unique component of the distress related to the receipt of report cards. Thus, the work of Hilsman and Garber was followed, resulting in separate assessments of the impact of each stress index.

Procedure

Consent was granted to conduct the study from the relevant school boards, principals, and parents of potential participants. In this study, the parental consent rate was 92.4%. As in Study 1, children with consent were visited in their classrooms by two to three researchers, with teachers remaining in the classroom during the assessment. Questionnaires were presented in a package format, and students completed the questionnaire package while seated at their individual desks. Each item of every measure was read aloud by one researcher who stood at the front of the classroom, and following the reading of the item children responded to it on their own copy of the questionnaires. Again, this afforded the children the opportunity to complete the assessment as a group and at a comfortable pace.

At Time 1, one week before the distribution of first term report cards, children completed the CADAS, the questionnaire to assess each child's lowest acceptable grade in each of six core academic subject areas, and the CDI, in this order. The order of questionnaire administration was carefully considered, the result being a fixed questionnaire sequence in lieu of a randomized one. This order afforded the assessment of dysfunctional attitudes and acceptable grades without the potential influence of the assessment of depressive symptoms. Report cards were given to children to take home one week later at the end of the school day. At Time 2, the morning after report cards were distributed, participants completed the CDI, CTI-C, and the PRQ, in this order. This presentation allowed the key dependent variable of depression level, as well as the negative cognitive triad, to be assessed prior to children being asked to recollect parental reactions to report cards. At Time 3, five days after the receipt of report cards, participants completed the CDI and CTI-C, in that order.

The standard temporal reference of the CDI was modified to correspond to the study's protocol. At Time 1, as originally developed, the CDI assessed depressive symptoms over the previous two weeks. At Times 2 and 3, children were instructed to select the option that best describes them "since the day [they] received [their] report card.".

Results and Discussion

Table 4 presents the means and standard deviations of, as well as the intercorrelations between, all measures.

Testing the Diathesis-Stress Component

Hierarchical multiple regression analyses (Cohen & Cohen, 1983) were performed to test the diathesis-stress component of Beck's (1967, 1987) theory of depression. The dependent variable in these analyses was either Time 2 or Time 3 CDI scores, depending on whether immediate or enduring changes in depressive symptoms were being examined. Time 1 CDI scores were first entered into the regression equations to control for initial depression levels and to thus create residual change CDI scores. Second, the stress variable was entered (PRQ if testing the impact of parental reactions to report cards, GRDEF if testing the impact of grade deficit scores). Third was the entry of the diathesis variable of dysfunctional attitudes (CADAS). Last, and of primary interest, the interaction term was entered (PRQ × CADAS, or GRDEF × CADAS, depending on which stress index was being tested). The recommendations of Aiken and West (1991) were implemented, thus dependent variables and predictors were standardized in all equations. Likewise, interaction terms were computed from the products of the standardized predictors.

Preliminary regression equations were constructed to examine the potential effect of gender on changes in depressive symptoms. Thus, 24 preliminary regression analyses tested the main effect of gender and its 2-, 3-, and 4-way interactions with CADAS, PRQ or GRDEF, and age to predict changes in CDI scores at Times 2 and 3. Only one equation was significant at the .05 level (the Gender × PRQ interaction predicted changes in CDI scores from Time 1 to Time 2, increment in $R^2 = .015$, *F change* [1, 236] = 7.55, *p* <.01). However, with the employment of the Bonferroni correction to control for the number of analyses conducted, this effect was no longer statistically significant. Thus, all subsequent analyses collapsed across gender.⁴

Since the two stress measures were only moderately correlated, initial regression analyses examined the potential differential effects of the PRQ and GRDEF. At Time 2 and Time 3, there was no main effect of GRDEF on changes in CDI scores (ps = .50) and

⁴ Given the high degree of ethnic diversity in this sample, potential group differences in key variables were also examined. The sole group difference observed pertained to GRDEF, such that children of Caribbean descent reported significantly greater grade deficit scores relative to children of European, of Southeast Asian, and of Indian Subcontinent descent. However, there were no group differences in the variables examined in the central regression analyses presented in Tables 5 and 6, specifically Time 1 CDI, Time 2 CDI, Time 3 CDI, CADAS, and PRQ. Controlling for ethnicity in these regression analyses presented in Tables 5 and 6 yielded an identical pattern of results.

no significant GRDEF × CADAS interaction (ps = .22).⁵ Accordingly, subsequent analyses employed the PRQ as the stress index.

Table 5 presents the results of the hierarchical regression analyses pertaining to the impact of dysfunctional attitudes and parental reactions to report cards. At Time 2, there was a main effect of parental stress in predicting residual change in CDI scores. CADAS alone was not a significant predictor. Similarly, the PRQ \times CADAS interaction was not a significant predictor of residual CDI change at Time 2.

At Time 3, parental stress continued to have a main effect on residual changes in CDI depression. CADAS had no such effect. However, in line with the present hypotheses and of key relevance in testing the diathesis-stress component of Beck's (1967, 1987) theory of depression, the PRQ × CADAS interaction was a significant predictor of residual change in CDI scores, pr = .15, *F change* (1, 236) = 5.18, *p* < .05.

To examine the nature of this interaction and to determine if its form was as predicted, residual CDI change scores were computed by substituting specific values into the regression equation (± 1 standard deviation about the mean). The resulting values were then plotted (Aiken & West, 1991; Cohen & Cohen, 1983). The form of the interaction is presented in Figure 1. Congruent with the hypothesis, when parental reaction was negative, children high in dysfunctional attitudes showed greater increases in CDI scores relative to children low in dysfunctional attitudes whose CDI scores indicated little change.

⁵ The impact of report card grades was also examined by regressing actual grades onto acceptable grades and using the residual as the stress variable. The same pattern of results emerged. Further, the impact of report card grades unadjusted for their level of acceptability was tested. Again, the same pattern was revealed.

Interestingly, when parental reaction was positive, children high in dysfunctional attitudes manifested greater *decreases* in CDI scores relative to children low in dysfunctional attitudes, whose CDI scores again showed little change. This parallels the findings of Joiner et al. (1999) in research conducted with college students. Congruent with the comments of Joiner and colleagues, this latter finding suggests that children high in dysfunctional attitudes may ascribe greater significance and emotional impact to potential stressors. The resulting heightened importance of stressful events for high-dysfunctional attitude children may explain the greater bi-directional volatility of the changes in their depressive symptomatology relative to their low-dysfunctional attitude peers (Joiner et al.; Olinger, Kuiper, & Shaw, 1987). Relative to children high in dysfunctional attitudes, children low in dysfunctional attitudes demonstrated little change in CDI scores. Thus, low-dysfunctional attitude children exhibited only relatively small increases in depression levels when parental reactions were negative, and relatively small decreases in symptomatology when parental reactions were positive.

Testing the Developmental Hypothesis

To test the hypothesis that age would further moderate the interaction of dysfunctional attitudes and stress in predicting changes in depressive levels, the sample was subsequently split into two age groups (older vs. younger). The diathesis-stress component of Beck's (1967, 1987) theory was then examined separately in each group.⁶

⁶ In addition to the split-group analyses, three-way regression analyses were conducted to test the AGE \times PRQ \times CADAS interaction when predicting change in CDI scores at Time 3. After entering the three main effects terms and three 2-way interaction terms,

The age at which to split the sample was carefully considered since there is no *bona fide* age at which children are undoubtedly capable of formal operational thought and thus are also capable of hypothetical-deductive reasoning as purportedly required by the CADAS. The Piagetian theory of cognitive development posits that the inception of formal operational thought occurs at the age of 11-12 years (Flavell, 1963; Flavell, Miller, & Miller, 1993; Inhelder & Piaget, 1958; Piaget, 1967). These guidelines were weighed in concert with the fact that the progression to formal operational thought processes is gradual in nature. For both theoretical (i.e., to seek a midpoint between the ages of 11 and 12 years) and statistical (i.e., to have comparable sample sizes in each group for similar power) considerations, the sample was divided at its median age, specifically 11 years, 5 months.⁷ The younger group was thus conceptualized as consisting of predominantly preformal operational thinkers, and the older group as consisting of predominantly formal operational thinkers.

The results of the diathesis-stress analyses in the younger (n = 120) and in the older (n = 121) age groups are presented in Table 6. As hypothesized, the PRQ × CADAS interaction was significant only among older children, pr = .28, *F change* (1, 116) = 10.14, p < .01. These older children, relative to the younger group, were

the 3-way interaction was marginally significant, F change (1, 232) = 2.94, p = .09, supporting the developmental hypothesis. The AGE × PRQ × CADAS interaction predicting changes in CDI scores at Time 2 was nonsignificant, F change (1, 232) = .01, p = .94. Separate analyses treating age (in months) as a continuous and dichotomous (younger vs. older) variable yielded a similar pattern of results. In line with the recommendations of Cohen and Cohen (1983), the results presented use age as a continuous variable.

⁷ Additional regression analyses tested the PRQ \times CADAS interaction separately in younger and older children with the sample split into two groups at 132 months (11 years) as well as at 144 months (12 years). The same pattern of results emerged as when split at the median age (11 years, 5 months).

conceived as being predominantly formal operational with regard to their cognitive capacities. An analysis of the difference between independent correlations (Cohen & Cohen, 1983) was conducted to examine if the PRQ × CADAS interaction accounted for a significantly greater proportion of the variance in CDI residual change scores in the older group compared to in the younger group. As expected, the partial correlations of the PRQ × CADAS interaction in the two groups differed significantly, z = 1.96, p = .05.

To determine if the form of the interaction was as predicted, specific values of the independent variables again were inserted into the regression equation (± 1 standard deviation about the mean). The obtained values were then plotted (Aiken & West, 1991; Cohen & Cohen, 1983). Figure 2 indicates that the form of the interaction was as hypothesized. When parental reaction was negative, children high in dysfunctional attitudes showed marked increases in CDI scores relative to children low in dysfunctional attitudes, whose CDI scores showed little change. When parental reaction was positive, children high in dysfunctional attitudes revealed a greater *decrease* in CDI scores relative to children low in dysfunctional attitudes, again replicating in children the findings of Joiner et al. (1999) that were obtained from a college student sample. Once more, this supports the notion that high-dysfunctional attitude children may attach greater significance and emotionality to potential stressors, thus contributing to the amplified range of change in their depressive symptomatology, when facing a stressful life event, relative to low-dysfunctional attitude children (Joiner et al., 1999; Olinger et al., 1987).

Testing the Causal Mediation Component

To test the causal mediation component of Beck's (1967, 1987) theory, the procedures outlined by Baron and Kenny (1986) were implemented. Thus, a series of regression equations were constructed to determine if negative thoughts of the self, of the world, and of the future mediated the relationship between the PRQ × CADAS interaction and changes in depressive symptomatology at Time 3. In order for mediation by, say, negative thoughts of the self (NTS), a series of conditions must hold. First, the PRQ × CADAS interaction must predict changes in depressive symptomatology at Time 3. Second, the PRQ × CADAS interaction must predict the mediator, NTS. Third, the insertion of NTS as an independent variable in the first regression equation must affect the prediction of depressive change by the PRQ × CADAS interaction. Complete mediation holds if the PRQ × CADAS interaction is no longer a significant predictor of depressive changes. Partial mediation holds if the effect of the interaction is attenuated, yet still significant.

For negative thoughts of the self (NTS), all of the above conditions were met, thus supporting the hypothesis that NTS mediates the relationship between the PRQ × CADAS interaction and Time 3 changes in depressive symptomatology.⁸ First, as reported in Table 5, the PRQ × CADAS interaction predicted changes in CDI scores at Time 3. Second, the diathesis-stress interaction also predicted Time 3 NTS, pr = .15, F*change* (1, 237) = 5.47, p = .02. Last, when NTS was inserted into the first equation, the PRQ × CADAS interaction ceased to be significant predictor of changes in depression at

⁸ The causal mediation analyses were conducted using the full sample as well as using only the older children based on the sample split at its median age. The same pattern of results emerged in both cases. The results of the full sample are reported.

Time 3, pr = .03, F change (1, 235) = .15, p = .70 (in contrast to pr = .15, F change [1, 236] = 5.18, p = .02 when NTS was not controlled for). As hypothesized, these results support the complete mediation of the relationship between the PRQ × CADAS interaction and Time 3 changes in depressive symptoms by NTS.

The PRQ × CADAS interaction did not significantly predict Time 3 negative thoughts of the world (NTW), pr = .01, F change (1, 237) = .02, p = .89. This interaction also did not predict Time 3 negative thoughts of the future (NTF), pr = .05, Fchange (1, 237) = .70, p = .40. Thus, the relationship between the PRQ × CADAS interaction and Time 3 depressive changes was not mediated by these two individual components of the negative cognitive triad.

Summary

To review, the interaction between Time 1 CADAS and Time 2 PRQ predicted increases in CDI scores at Time 3, collapsing across children's ages. When this effect was examined in children of different age groups, this interaction was found to hold only in older children (11 years, 5 months and up), in line with theories of cognitive development that suggest that only children above 11-12 years of age may be able to process abstract, hypothetical statements like CADAS items. In all cases, the interaction indicated that high-dysfunctional attitude children who reported negative parental reactions to their report cards also reported greater increases in depressive symptomatology five days after receiving their grades, relative to their lowdysfunctional attitude counterparts. As well, replicating the results of Joiner et al. (1999) obtained from adults, children who endorsed high degrees of dysfunctional attitudes and who also received favourable parental reactions to their report cards demonstrated greater decreases in depression levels relative to their low-dysfunctional attitude peers. Further, in line with the causal mediation component of Beck's (1967, 1987) theory, negative thoughts of the self, a component of the negative cognitive triad, fully mediated the relationship between the CADAS × PRQ interaction and the increases in depression levels from Time 1 to Time 3.

General Discussion

This discussion will encompass a series of issues that are relevant to the studies presented herein. First, the hypotheses and empirical findings of both studies will be reviewed, with coverage of both predicted as well as unexpected findings. Attention will also be paid to issues that remain currently unresolved in cognitive diathesis-stress research. For example, the priming of depressogenic schemata prior to their assessment, and the potential deconstruction of cognitive constructs into more circumscribed vulnerabilities, will be reviewed. Some of the unique strengths of the current research will be presented, along with potential clinical implications that derive from this research. A discussion of the limitations of the current research will precede a general conclusion.

Review of Hypotheses and Key Findings

The present studies sought to extend research into Beck's (1967, 1987) cognitive diathesis-stress theory of depression to school-aged children. A psychometricallyvalidated instrument was introduced that is intended to measure depressogenic schemata, operationalized as dysfunctional attitudes, specifically designed for use in children and young adolescents. Subsequently, this research tested the diathesis-stress and causal mediation components of Beck's theory of depression in children. Knowledge garnered from the domain of developmental psychopathology was explicitly incorporated into Beck's theory, taking into consideration the normative processes of cognitive development that may impinge upon cognitive theories of depression. The first study was designed to develop and psychometrically validate the Child and Adolescent Dysfunctional Attitudes Scale (CADAS), a self-report instrument modeled after the Dysfunctional Attitudes Scale (DAS; Weissman, 1979; Weissman & Beck, 1978), the latter being the most frequently employed measure of depressogenic schemata in adults. A principal objective was a finalized version of the CADAS that would demonstrate favourable internal consistency and test-retest reliability, as well as exhibit an acceptable factor structure. With respect to the discriminant validity of the CADAS, it was expected that children's dysfunctional attitudes would be moderately positively correlated with levels of depression, negative affect, negative views of the self, of the world, and of the future, dependency, self-criticism, and with neuroticism. Conversely, dysfunctional attitudes were expected to be moderately negatively correlated with positive affect and with self-esteem. Ideally, socially desirable response tendencies would be unrelated to levels of dysfunctional attitudes in children.

The second study was designed to test whether dysfunctional attitudes act as a cognitive vulnerability to depression in children who experience psychosocial stress, such as the events surrounding the receipt of school report cards. Further, it was also examined whether components of the negative cognitive triad act as mediators in the expression of symptoms of depression as theorized by Beck (1967, 1987). It was hypothesized that dysfunctional attitudes would interact with stressors to predict increases in levels of depression after controlling for initial levels of symptomatology. In consideration of developmental-psychopathological theory, an additional hypothesis maintained that this interaction would hold only in more mature children (aged 11-12 years and older) who have the formal operational cognitive skills that allow the

processing of abstract, hypothetical themes that are inherent in depressogenic schemata. With respect to the causal mediation component of Beck's theory, it was predicted that the relationship between the diathesis-stress interaction and changes in levels of depression would be mediated by specific components of the negative cognitive triad, namely negative views of the self, of the world, and of the future.

After simplifying and restructuring the language of the adult DAS, items that were redundant, that were not applicable to children, or that continued to present comprehension difficulties for children were eliminated, yielding a 40-item pool of candidate CADAS items. Following a preliminary examination of the suitability of these items for children, the psychometric guidelines provided by Streiner and Norman (1989), Clark and Watson (1995), and Floyd and Widaman (1995) were followed to develop a 22-item version of the CADAS. This 22-item CADAS demonstrated excellent psychometric properties. The alpha coefficient was .87, the mean inter-item correlation was .24, and the three-week test-retest reliability was .80. Corrected itemtotal correlations ranged from .39 to .53. Additionally, a unidimensional factor structure described the CADAS well. These psychometrics were replicated in an independent sample that was the basis of the second study.

Complementing the strong psychometric properties of the CADAS was the divergent validity of the instrument relative to other depression- and nondepression-related constructs. As hypothesized, CADAS scores were moderately positively correlated with children's levels of depression, negative affect, negative thoughts of the self, of the world, and of the future, self-criticism, and neuroticism, with correlations ranging from .23 to .41. Conversely, and as predicted, children's levels of dysfunctional

59

attitudes were moderately negatively correlated with self-esteem (r = -.58). It is important to note that while clearly some variance is shared between the CADAS and other instruments that assess depression-related constructs, the construct with the strongest relationship to dysfunctional attitudes, self-esteem, leaves 66% of the variance in dysfunctional attitudes unaccounted for. Thus, children's dysfunctional attitudes appear to form a relatively differentiated construct that is not subsumed by pre-existing validated constructs that are delineated in the research of childhood depression. Importantly, the tendency to respond in a socially desirable manner was not related to levels of dysfunctional attitudes, thus suggesting that responses to the CADAS were not tainted by social convention or by impression management.

Study 2 is the first study conducted to date that strongly supports Beck's (1967, 1987) cognitive diathesis-stress theory of depression in school-aged children. Confirming the hypotheses, children who reported high degrees of dysfunctional attitudes and who subsequently underwent a stressful life event experienced significantly greater increases in depressive symptoms five days after the stressor relative to children who underwent the same degree of stress but who reported low degrees of dysfunctional attitudes. Here, the stressful event was the receipt of a report card that elicited parental disappointment and anger. This effect was evident when collapsing across age in the sample. However, as hypothesized, when the sample was split into younger and older age groups based on cognitive-developmental theories of the acquisition of hypothetico-deductive thinking that is inherent in items that assess dysfunctional attitudes, the diathesis-stress interaction predicted by Beck's theory was evident only in children aged 11-12 years and older. It is these more mature children who, according to cognitive-developmental theory (e.g., Flavell, 1963; Inhelder & Piaget, 1958; Piaget, 1967), tend to possess the formal operational reasoning skills that allow the cognitive diathesis of dysfunctional attitudes to meaningfully develop. In contrast, more cognitively immature children tend to respond directly to the concrete elements of their environment. Thus, in such younger children, abstract cognitive diatheses may not impinge upon their emotional, physical, behavioural, and cognitive reactions to negative life events (Abela, 2001; Digdon & Gotlib, 1985; Garber, 1992, 2000; Garber & Flynn, 2001; Nolen-Hoeksema et al., 1992; Turner & Cole, 1994).

The results of the second study also replicate the adult-based findings of Joiner et al. (1999). As such, children who endorsed high degrees of dysfunctional attitudes and who subsequently received favourable parental reactions to their report cards demonstrated decreases in depressive symptomatology five days later. Relative to these high-dysfunctional attitude children, those who endorsed low degrees of dysfunctional attitudes and who likewise received favourable parental reactions had levels of depression that demonstrated relatively less change. As suggested by Joiner et al. (1999) in reference to the literature on contingent self-worth and depression (Olinger et al., 1987), it may be that children high in dysfunctional attitudes ascribe greater importance and emotional impact to life events, regardless of their positive or negative valence. This subjective amplified significance of environmental events to children high in dysfunctional attitudes may explain their volatility of depressive symptoms when facing both negative and positive life events as a function of their degree of depressogenic schemata is necessary to address this possibility.

61

In addition, and confirming the hypothesis, the results of the second study provide strong support for the causal mediation component of Beck's (1967, 1987) cognitive diathesis-stress theory in children. Negative thoughts of the self completely mediated the relationship between the interaction of dysfunctional attitudes and life stress and the increases in depressive symptomatology. Thus, strong support was uncovered for the notion that children with high levels of dysfunctional attitudes who subsequently undergo a stressful life event develop a negative view of the self. In turn, according to the theory, for these children this negative view of the self leads to increases in depressive symptoms.

Some findings contrary to expectations were revealed in the present studies. First, while the dysfunctional attitude × stress interaction predicted enduring depressive symptom changes as assessed five days after the receipt of children's school report cards, this diathesis-stress interaction was not predictive of immediate depressive changes as assessed the morning after the receipt of the report cards. Based on the results of previous short-term prospective studies that have examined diathesis-stress theories of depression, multiple factors may underlie this finding. The current result of diathesis-stress interactions that are predictive of enduring changes, but not immediate changes, in levels of depression replicates the results found in both the adult- and childbased literatures that have examined the reformulated learned helplessness model of depression (Abramson et al., 1978) and its theoretical successor, the hopelessness theory of depression (Abramson et al., 1989). From this theoretical stance, the presence of attributional style × stress interactions predictive of enduring but not immediate increases in depression has been found in previous adult prospective studies (Metalsky,
Halberstadt, & Abramson, 1987; Metalsky, Joiner, Hardin, & Abramson, 1993). Importantly, the present findings also replicate the results stemming from child samples where the prediction of enduring, but not immediate, changes in level of depression by diathesis-stress interactions has also been reported (Hilsman & Garber, 1995).

In the same vein, the current studies replicate previous research in both children and adults (Hilsman & Garber, 1995; Metalsky et al., 1987, Metalskly et al., 1993) in that immediate depressive reactions are predicted solely by life stressors, and not by the diathesis × stress interaction. As discussed in previous diathesis-stress research (e.g., Hilsman & Garber, 1985; Metalsky et al., 1987) the work of Weiner (Weiner, 1985; Weiner, Russell, & Lerman, 1978) is fruitful in understanding this pattern of results. Weiner differentiated between two sources of emotion related to stressful events: outcome-dependent sources and attribution-dependent sources. Immediately following a stressful event, individuals may experience an initial emotional response fostered heavily by the outcome of the event, independent of any cognitive moderation (e.g., causal attribution) of the outcome. Following this initial emotional response, Weiner and colleagues suggested that a causal explanation in the form of an attribution occurs. As an individual begins to allow a cognitive process such as a depressogenic causal attribution to impinge on the stress, more enduring depressive symptoms may ensue.

Although Weiner's (1985) contentions have been associated with the role of causal attributions, a comparable process may be at play regarding the impact of dysfunctional attitudes. Children, regardless of whether they carry the cognitive vulnerability of dysfunctional attitudes, may have an immediate depressive reaction to a stressful event that overrides any cognitive predisposition. However, as time begins to

pass, more cognitive processes may begin to "kick in", moderating the impact of the stressor and extending or attenuating the duration of the depressive response. Young Charlie, initially saddened, sleepless, not hungry, feeling guilty, and physically sluggish due to his parents' frowning upon his report card, and who subsequently falls prey to his stable dysfunctional attitude that "people will like me only if I am always good" may present with a more enduring depressive response than his classmate Linus who witnesses a similar reaction by his own parents and who also initially feels dysphoric, but who subsequently benefits from his stable adaptive attitude that he will be liked regardless of his transient "badness".

Another factor that may account for the absence of a dysfunctional attitude × stress interaction immediately following the onset of life stress is the employment of the CDI (Kovacs, 1980-1981, 1985) in the present studies. The CDI is a comprehensive measure that assesses the affective, cognitive, behavioural, and physical symptoms of depression, thus differing from measures that assess depressed mood only. In the adult literature, studies that have tested diathesis-stress theories of depression from a hopelessness theory perspective (Abela & Seligman, 2000) and from Beck's (1967, 1987) perspective (Abela & D'Alessandro, 2002) and that have employed measures of depressed mood have yielded a pattern of results opposite to those found presently. In such studies that solely assessed depressed mood (e.g., Abela & D'Alessandro, 2002; Abela & Seligman, 2000) diathesis-stress interactions predictive of immediate depressed mood are reported, but contrary to diathesis-stress theories of depression, no enduring depressive mood response was evident. Thus, one potential explanation for the discrepancy among different studies that, on one hand, report immediate but no enduring diathesis-stress interaction, yet on the other hand report enduring but no immediate diathesis-stress interaction, may be the dependent variable assessed.

As elaborated by Abela and D'Alessandro (2002), immediately after the occurrence of a stressful event, individuals who carry a cognitive vulnerability to depression may experience an acute exacerbation of depressed mood. However, sufficient time has not passed for the onset of other symptoms of depression that may be physical, cognitive, or behavioural in nature. The CDI, and its adult predecessor, the Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979; Beck, Steer, & Garbin, 1988), by virtue of their comprehensive assessment of the construct of depression, may be less sensitive to changes solely in depressed mood relative to moodfocused instruments such as the Multiple Affect Adjective Checklist (MAACL; Zuckerman & Lubin, 1965) or the PANAS (Laurent et al., 1999; Watson, Clark, & Tellegen, 1988). Research employing the CDI may be more prone to detect enduring changes in depression than to detect immediate changes since disruptions to sleep patterns, appetite, energy levels, and somatic symptoms are not immediately evident. Conversely, research targeting depressed mood may be more sensitive to immediate changes in depressive symptomatology. The present studies, as well as previous research (e.g., Abela & D'Alessandro, 2002; Abela & Seligman, 2000; Metalsky & Joiner, 1992; Metalsky et al., 1993) lend support to this line of reasoning. It should be noted, however, that findings from other studies have reported enduring effects with mood as an outcome. For example, Hilsman and Garber (1995) revealed enduring depressed mood as assessed with an adjective checklist for children, while Metalsky et

al. (1987) reported enduring depressed mood as assessed with the MAACL (Zuckerman & Lubin, 1965).

A second unexpected finding from the present studies was the pattern of effects involving the two stress indices. There was no main effect or diathesis-stress interaction involving the stress index of students' grade deficit scores when predicting both immediate and enduring depressive responses. The lack of effects involving grade deficit scores stands in contrast to the research by Hilsman and Garber (1995), who, in their examination of attributional style and cognitions about academic competence and control as vulnerabilities to childhood depression, found grade stressors to exert a main effect on immediate changes in levels of depression, although not on enduring depressive changes. As well, Hilsman and Garber found interactions between the grade stressor and both attributional style and academic cognitions that predicted enduring changes in levels of depression, however there were no diathesis × grade stressor interactions predictive of immediate depressive changes.

With regard to parental reactions to children's report cards, the present results again contrast with those of Hilsman and Garber (1995) who, in fifth- and sixth-grade children, reported such a main effect predictive of immediate, but not enduring, changes in depression levels, but no cognitive diathesis × parental reaction interactions were reported that predicted immediate or enduring changes in levels of depression. In light of their findings, Hilsman and Garber posited that stress resulting from parental reactions may distress children when interacting with their parents, but that this distress may be short-lived. The present finding of a main effect of parental reactions at Time 3 suggests, however, that the distress from parental reactions to report cards may not

always be transient, as in the current studies where parental reactions continue to exert a depressive effect many days after the stressors' occurrence. One factor that may account for differential findings across studies is the frequency and duration of the parental reactions, as suggested by Hilsman and Garber (1995). Negative parental reactions that are contained in a brief, discrete time period may have a less-enduring impact than those that persevere intermittently or continuously over time. As such, future research may examine not only the presence of stressful events such as negative parental reactions, but also their timing of onset as well as their duration.

With respect to the finding that, in the current studies, it was the parental reactions to report cards that interacted with a cognitive diathesis to predict enduring changes in levels of depression, while, in other research (Hilsman & Garber, 1995) it was the grade deficit score that interacted with cognitive diatheses to predict enduring changes in depression, two factors may be at play. First, as mentioned, the perceived duration of stressors differs across individuals, and thus children in the present studies may have experienced more repeated and long-lasting negative reactions from their parents than children in other samples.

A second, and perhaps more interesting, explanation that may account for the differing stress effects across studies is that the studies examined diverse cognitive theories of depression. Therefore, two diverse cognitive diatheses were assessed. Hilsman and Garber (1995) tested the effects of academic cognitions (perceived competence and control) as well as of attributional style (a component of the reformulated learned helplessness and hopelessness theories), while the present research assessed the impact of dysfunctional attitudes (a key cognitive construct of Beck's

[1967, 1987] theory). As such, it is plausible that different cognitive diatheses may be sensitive to, and thus impinge upon, distinct forms of stress. Thus, a given diathesis may moderate the impact of selected classes of negative life events. Indeed, this is congruent with the suggestion of Hilsman and Garber that cognitions more relevant to the parent-child relationship may moderate the impact of negative parental reactions to report cards more than cognitions less pertinent to the parent-child relationship. In support of this contention, research has suggested that depressogenic schemata, operationalized as dysfunctional attitudes, may best be conceptualized as a cognitive diathesis to depression when an individual is faced with negative interpersonal events (Barnett & Gotlib, 1990). In the present studies, the stress index of parental reactions to report cards may be conceptualized as assessing an interpersonal event, although not exclusively so since, for some children, parental reactions to report cards may also be achievement-related. The grade deficit score may be conceptualized as assessing predominantly intrapersonal or achievement-oriented stress. Thus, the present findings support the notion of dysfunctional attitudes acting as a diathesis to depressive symptoms in reaction to stressors that may be associated with interpersonal experiences. Future research is required to examine this potential specificity between certain broad theory-based categories of cognitive diatheses and the classes of negative life events with which they may interact. A more general review of the issue of specific interactions within a theory (e.g., achievement- and interpersonally-related dysfunctional attitudes and their interactions with perceived matching stressors) is included further along in this discussion.

A unique aspect of the present research is that each component of Beck's (1967) negative cognitive triad was independently tested as a mediator of the relationship between the dysfunctional attitudes × stress interaction and the increase in levels of depressive symptoms. Previous adult-based research has examined the causal mediation component of Beck's theory by comparing classes of depressive versus anxious cognitions (Joiner et al., 1999), by considering general negative automatic thoughts alone as mediators (Kwon & Oei, 1992), and by examining limited components of the negative cognitive triad (Abela & D'Alessandro, 2002). However, the present research is the first to date that explicitly examines all three components of Beck's triad as potential mediators in children. The finding that children's negative views of the self fully mediated the relationship between the dysfunctional attitudes × stress interaction and increases in the severity of depression suggests that children carrying depressogenic schemata who subsequently experience a stressful event develop a negative view of the self. In turn, this negative view of the self may act as a proximal and sufficient cause of depression and thus leads to the emergence of symptomatology.

Interestingly, and contrary to hypotheses, two components of the negative cognitive triad, specifically negative views of the world and of the future, did not mediate the relationship between the depressogenic schemata × stress interaction and increases in depressive symptoms. These findings suggest that, for children, a negative view of the self may be a particularly caustic subset among general depressive cognitions. This possibility that a negative self-view is the component of the negative cognitive triad that, in children, acts as a uniquely potent catalyst of depression is supported by relatively diverse findings stemming from adult samples. Recent research

that has examined the mediation component of Beck's (1967, 1987) theory suggests that a negative view of the self, for adults, does not mediate the relationship between the depressogenic schemata × stress interaction and increases in depressive symptoms. Instead, adult-based research suggests that a negative view of the future may be a sufficient and proximal cause of depression (Abela & D'Alessandro, 2002).

Turning to cognitive-developmental theory may be useful in generating one possible explanation for this divergent pattern of results. Piaget (Flavell, 1963; Inhelder & Piaget, 1958) delineated that between the ages of 11 and 12 years children progress to a more formal operational mode of thought, characterized by the ability to conceptualize beyond what is concrete and to thus engage in hypothetico-deductive thinking. It would be imprudent, however, to blindly ascribe complete and global formal operational cognitive ability to an individual solely based on chronological age. Researchers have suggested that Piaget may have underestimated children's cognitive reasoning (e.g., Flavell, 1992; Halford, 1989; Karmiloff-Smith, 1992). Conversely, other research has indicated that many adolescents, indeed some adults, may still perform poorly on typical formal operational problems (e.g., Commons, Miller, & Kuhn, 1982; Shayer & Wylam, 1978).

Given that there is no abrupt shift from concrete operational thought processes to those characterized by formal operational thought, and given the debate regarding the virtue of determining a *bona fide* age when developmentally-normal individuals undoubtedly attain formal operational skills, a gradual progression towards formal operational thought processes is generally accepted among cognitive developmentalists (Flavell, 1971; Flavell et al., 1993). With this acceptance comes the contention that cognitive milestones transpire slowly and progressively. A child who begins to demonstrate knowledge characteristic of a particular stage of development (e.g., the conservation of weight typically displayed in the concrete operational stage) may continue to consolidate and internalize this knowledge well beyond the "normal" chronological marker of seven years of age. Evidence indicates that the movement from initial manifestations of a cognitive-developmental stage towards a palpable command of the stage's competencies requires a passage of time on the order of many years, not many months. This questions the notion of a cognitive-developmental stage as stagnant, and purports that these stages may be much more dynamic than static (Flavell et al., 1993). These arguments lend credence to the possibility that children who begin to demonstrate signals of formal operational thought may be years away from globally and functionally exercising this skill.

Relating the above arguments to the present findings of specific mediation only by negative views of the self, it may be that children who have initiated formal operational thought tendencies (and thus for whom dysfunctional attitudes may represent a cognitive vulnerability to depression) still have difficulty comprehending the inherently abstract constructs of the future and of the world. For such children who are just beginning to consolidate knowledge and to generate cognitions described by formal operations, negative views of the future and of the world may not be subjectively sufficiently meaningful or functional to impinge upon one's emotional, physical, behavioural, and cognitive functioning to elicit symptoms of depression. On the other hand, a negative view of oneself may be a sufficiently concrete and salient catalyst of depressive symptoms that has the potential to resonate with individuals who are just beyond the cusp of formal operational cognitive tendencies, yet who are still immature regarding their global applications. In the present studies, one factor that may explain the lack of prediction of a negative view of the world and of the future by the dysfunctional attitudes × stress interaction may be that these two potential mediators remain beyond the reasoning capabilities of participating children and thus may not have been meaningfully assessed. Further research with older children and adolescents is needed to examine this possibility and to determine if more abstract constructs begin to mediate the relationship between diathesis-stress interactions and changes in depression levels as individuals more fully master formal operational cognitive reasoning.

The Potentially Latent Nature of Depressogenic Schemata

A further issue that warrants consideration is the elaboration of Beck's (1967, 1987) theory to suggest that depressogenic schemata are latent in individuals vulnerable to depression and that such schemata must be activated by life stressors, or by sad affect, to exert their depressogenic effects. This extension of the theory results from debate over the stable nature of depressogenic schemata in light of findings that schemata levels decline in tandem with depressive symptoms in individuals whose depression has remitted (Barnett & Gotlib, 1988b). In an attempt to reconcile the debate over the stability of depressogenic schemata, Persons and Miranda (1992) proposed a mood-state hypothesis whereby depressogenic schemata are indeed stable, however the ability to assess schemata is dependent upon one's mood state. Thus, as one's depression remits, stable schemata remain but withdraw into a more latent, inaccessible form.

mood states should not be predictive of subsequent changes in depression. Instead, accurate measurement of depressogenic schemata requires their assessment during a negative mood state that activates the schemata from their latent form. Methodologically, according to the mood-state hypothesis, this translates into the need to assess schemata following a priming procedure (e.g., Velten, 1968) to induce a negative mood state.

Previous correlational research has yielded support for the mood-state hypothesis (e.g., Miranda & Persons, 1988; Miranda, Persons, & Byers, 1990). This work has demonstrated that levels of depressogenic schemata are related to mood in vulnerable individuals, with vulnerability here defined as having experienced a previous depressive episode. However, these studies do not directly address whether mood indeed activates depressogenic schemata from their hypothesized latent state. Alternatively, it may be that these schemata activate negative mood states, or that both schemata and mood states are affected by a third variable. A more recent investigation (Miranda, Gross, Persons, & Hahn, 1998) sought to respond to these concerns, and found that for recovered-depressed individuals, increased negative mood led to increased levels of depressogenic schemata.

Other researchers have questioned the latent nature of depressogenic schemata as well as the mood-state hypothesis. Dykman (1997) found that individuals' moods did not enhance accessibility to depressogenic schemata. Further, he reported that depressogenic schemata assessed following the priming of negative moods were not differentially predictive of depressed affect. Rather, nonprimed schemata predicted

depressive mood reactions to imagined negative life events, congruent with Beck's (1967, 1987) theory.

Fuelling the debate over the need to activate depressogenic schemata via negative mood induction is the position by some researchers that remitted depression studies, such as those used to test the mood-state hypothesis, are inadequate tests of theories of cognitive vulnerability to depression (Abramson & Alloy, 1992; see also Just, Abramson, & Alloy, 2001). Specifically, critics of remitted depression studies maintain that this methodology is based on the assumption that depressogenic schemata are an unmodifiable trait. Instead, schemata are viewed by critics as potentially malleable, for example fluctuating over time or in response to cognitive therapy (e.g., Beck, Rush, Shaw, & Emery, 1979). Remitted depression studies are also criticized by some theorists for invoking "backward logic" (Just et al., 2001, p.71), in that they conceptualize the presence of depression and cognitive vulnerabilities as independent variables and dependent variables, respectively. Instead, as illustrated by the present research, cognitive theories maintain the inverse view that cognitive vulnerabilities are independent variables, and depression levels are perceived as dependent variables. Further, although some remitted depression studies that use mood-activating procedures find that levels of depressogenic schemata are mood dependent, this may not indicate that such schemata were instrumental in the onset of the prior depressive episode. Rather, in line with the "scar hypothesis" (Rohde, Lewinsohn, & Seeley, 1990), a depressive episode may remit but leave in its wake depressogenic schemata or other cognitive patterns that were not present before the episode, and that thus could not have

contributed to its onset. Miranda et al. (1998) acknowledged that findings in support of the mood-state theory do not rule out the possibility of the scar hypothesis.

Further complicating the debate regarding the elaboration of Beck's theory to include an explicit latent component of depressogenic schemata is research by investigators examining the state dependence versus stability of schemata. In a one-year longitudinal investigation, Zuroff, Igreja, and Mongrain (1990) reported high stability in unprimed DAS scores over the study's duration, and that the DAS was the best predictor of the period with most severe depressive symptoms. This suggests that the DAS may be a stable cognitive vulnerability to depression. A subsequent study by Zuroff, Blatt, Sanislow, Bondi, and Pilkonis (1999) found that, during treatment, depressed individuals continued to demonstrate stability in their relative levels of depressogenic schemata. However, individuals also demonstrated substantial mean changes in levels of depression and schemata. Zuroff et al. (1999) considered these findings as supportive of a state-trait model of vulnerability whereby such depressogenic schemata "are neither fixed and unchanging nor mere concominants of the depressed state." (p. 87).

Adding debate to the purported latent nature of depressogenic schemata are supportive results for Beck's (1967, 1987) theory both in studies that did use priming procedures to attempt to induce a negative mood state (e.g., Abela & D'Alessandro, 2002), as well as in studies that did not use such priming methods (e.g., Dykman & Johll, 1998; Joiner, Metalsky, Lew, & Klocek, 1999; Kwon & Oei, 1992). The consequence of these mixed results when addressing the notion of priming a negative mood state to detect and assess depressogenic schemata is uncertainty regarding whether such procedures are indeed necessary to adequately test Beck's theory. As put by Just et

al. (2001), "future research is needed to determine which hypothesized vulnerabilities for depression actually do require priming for adequate measurement." (p. 76). The present finding of unprimed depressogenic schemata that interact with stress to predict changes in levels of depression adds to the evidence that dysfunctional attitudes may not require priming to be meaningfully assessed.

Multidimensionality in Vulnerability Constructs

An issue that has been raised in the diathesis-stress literature regarding depression is the potential multidimensionality of cognitive constructs in place of unidimensional conceptualizations. Beck (1983) theorized two dimensions that may pose more targeted vulnerabilities to depression than general depressogenic schemata that he labeled *sociality* and *individuality*. Sociality (often referred to as sociotropy or social dependency) is characterized by "investment in positive interchange with other people. This cluster includes passive-receptive wishes (acceptance, intimacy, understanding, support, guidance); 'narcissistic wishes' (admiration, prestige, status); and feedback – validation of beliefs and behaviors. The individual is dependent on these social 'inputs' for gratification, motivation, direction, and modification of ideas and behavior. The motif of this cluster is 'receiving.'" (Beck, 1983, p. 272). Individuality (often referred to as autonomy), on the other hand, is characterized by "investment in preserving and increasing [one's] independence, mobility, and personal rights; freedom of choice, action, and expression; protection of [one's] domain; and defining [one's] boundaries. The person's sense of well-being depends upon preserving

the integrity and autonomy of [one's] domain; ...and attaining meaningful goals. The motif of this cluster is 'doing.'" (Beck, 1983, p. 272).

Other theorists, operating within diverse conceptual frameworks, have arrived at similar distinctions among personality styles that may act as vulnerabilities to depression. Blatt (1974), for example, distinguished between dependent individuals who are more prone to what he viewed as an "anaclitic depression", and self-critical individuals who are more prone to "introjective depression".

A corollary of this partialling of cognitive vulnerabilities into dimensional components is the contention that individuals with different flavours of cognitive vulnerabilities will be particularly prone to changes in depression levels following the occurrence of certain classes of negative life events. This "specific interaction hypothesis" maintains that sociotropic or dependent individuals will be especially affected by interpersonal stressors such as the loss of loved one, the dissolution of an intimate relationship, or the rejection by one's own peers. Conversely, autonomy-driven individuals are hypothesized to be adversely affected by achievement-oriented life stressors such as subjective poor performance on an examination, rejection of an academic admissions application, or job loss.

A number of instruments have been employed to assess individuals' dimensions of cognitive vulnerabilities to depression across diverse cognitive frameworks. The Sociotropy-Autonomy Scales (SAS; Beck, Epstein, Harrison, & Emery, 1983) assess levels of sociality and autonomy. The Depressive Experiences Questionnaire (DEQ; Blatt, D'Afflitti, & Quinlan, 1976), as well as its adolescent version (DEQ-A; Blatt,

Schaffer, Bers, & Quinlan, 1992), assess the related constructs of dependency and selfcriticism.

The DAS also has been used to measure interpersonal- and achievement-oriented cognitive vulnerabilities to depression. For instance, Mongrain and Zuroff (1989) examined attitudinal components of dependent and self-critical women's cognitive vulnerabilities and proposed an anaclitic subscale (e.g., "I am nothing if a person I love doesn't love me.") and an introjective subscale (e.g., If I fail partly at work, then I am a failure as a person.") using subsets of items from the DAS. Additionally, lending support to the potential deconstruction of depressogenic schemata as assessed by the DAS into sociotropy- and autonomy-related components are numerous factor analytic studies of the DAS (Beck, Brown, Steer, & Weissman, 1991; Calhoon, 1996; Cane, Olinger, Gotlib, & Kuiper, 1986; Dyck, 1992; Oliver & Baumgart, 1985; Power, Katz, McGuffin, Duggan, Lam, & Beck, 1994; Rude & Burnham, 1993; Whisman & Friedman, 1998). Although such factor analyses are not consistent with regard to the total number of dimensions (ranging from two to nine), they do consistently include both sociotropy-related factors (often labeled "Need for Approval", "Approval by Others", or "Dependency") and autonomy-related factors (often labeled "Performance Evaluation", "Achievement", or "Success-Perfectionism").

Across diverse theories of cognitive vulnerabilities to depression, results generally have been inconsistent regarding support for the specific interaction hypothesis, as noted by Joiner et al. (1999) specifically with regard to depressogenic schemata and as discussed by Coyne and Whiffen (1995) more generally in their review of this literature. Specific studies highlight these mixed results. Hammen, Marks, Mayol, and deMayo (1985) categorized participants into dependent and self-critical groups using a memory-recall task of relevant life events. The researchers found support for congruency between dependent individuals and interpersonal events that was associated with increased levels of depression. However, support for the contention that self-critical individuals who experienced congruent achievement-related events would show associated changes in depression levels was weak. Using the Sociotropy-Autonomy Scales (SAS), Robins and Block (1988) found that sociotropy moderated the relationship between depression and stressful interpersonal events. However, counter to the specific interaction hypothesis was an interaction between sociotropy and stressors conceptualized to be autonomy-related that predicted depression. Further, autonomy did not interact with life events of any nature to predict depression. More supportive findings using the SAS were provided by Hammen, Ellicott, Gitlin, and Jamison (1989) who demonstrated evidence of specific interactions in both sociotropy- and autonomymotivated individuals. In contrast, a study by Kwon and Whisman (1998) that employed the Personal Style Inventory (Robins, Ladd, Welkowitz, Blaney, Diaz, & Kutcher, 1994) to assess sociotropy and autonomy failed to find support for associations between sociotropic or autonomous orientations and congruent life stressors. The latter researchers suggest that sociotropy may act as a nonspecific vulnerability to all classes of negative life events, and highlight the difficulty in categorizing a life event as achievement-related or interpersonal in nature despite an apparent face validity of such distinctions. Rude and Burnham (1993) found no evidence that was supportive of the specific interaction hypothesis when considering achievement vulnerabilities, namely the DEQ Self-Criticism, SAS Autonomy, or DAS Performance Evaluation subscales, as

well as composite-based subscales. However, when considering interpersonal vulnerabilities, interactions between DEQ Dependency and SAS Sociotropy respectively and interpersonal stressors did predict levels of depressive symptoms. Notably, the DAS Approval by Others subscale failed to support the specific interaction hypothesis. Abela and Seligman (2000), in an examination of the hopelessness theory of depression, also found no evidence of specificity in diathesis-stress interactions, again noting the complexity inherent in categorizing life events into interpersonal and achievement subclasses.

In an experimental study that employed the DEQ as an index of cognitive vulnerability to depression in females, Zuroff and Mongrain (1987) found that dependent participants more often showed increases in depressive symptoms after exposure to an interpersonal stressor than after an achievement-related stressor. However, self-critical participants showed nonspecificity by virtue of increases in depressive symptoms after exposure to each of interpersonal- and achievement-related stress. Zuroff, Igreja, and Mongrain (1990) reported that self-critical women, like their dependent conspecifics, reported a greater proportion of interpersonal stressors during their most severe depressive periods. The authors thus suggest that interpersonal challenges may carry the greatest impact with regard to the onset of depressive symptoms, irrespective of one's flavour of cognitive vulnerability.

Researchers have also examined the specific interaction hypothesis in child samples, continuing the theme of mixed findings. Hammen and Goodman-Brown (1990) classified 8-16 year-old children into groups based on whether they attached particular meaning to achievement or interpersonal domains by using a memory recall task that targeted significant personal experiences. Children were then followed for six months, during which time achievement and interpersonal stressors were measured. Results indicated that a match between an attachment of strong meaning to interpersonal events and the experience of interpersonal stressors was related to depression outcomes. However, results were relatively unclear for children with achievement orientations since only four children who became depressed had such an orientation. The authors also qualified that the overall "matching effect" was most notable for children of mothers with affective disorders, who constituted 37.5% of the sample.

A recent study by Little and Garber (2000) that examined specific interactions in children involved 486 fifth- and six-grade students with a mean age of 11.4 years. Levels of sociotropy (Neediness and Connectedness) and achievement (Self-Criticism and Individualistic Achievement) orientations were assessed with the Sociotropy-Achievement Scale for Children that was developed by the authors. Three months later, stressors during this interval were assessed and categorized into social and achievement categories. With regard to depression as an outcome variable (anger and aggression were also assessed), results supported the specific matching hypothesis in that, for boys, the interaction between Connectedness and social stressors predicted depressive symptoms three months later. As well, no vulnerability factors interacted with nonmatching stressors to predict depression. Nonsupportive of the specific interaction hypothesis was the finding that neither of the achievement vulnerability factors interacted with achievement stressors to predict symptoms of depression.

With regard to the adult DAS, some support for specificity between cognitive diatheses and matching stressors has been found. Mongrain and Zuroff (1989)

demonstrated that anaclitic dysfunctional attitudes were associated with the perception of congruent interpersonal events, while introjective dysfunctional attitudes were associated with individuals' interpretations of congruent achievement-related events. The authors related these findings to those of others (e.g., Olinger et al., 1987) that also indicate that events in line with one's attitudinal predispositions impinge more greatly upon one's affective response. Segal, Shaw, Vella, and Katz (1992) reported that individuals whose DAS profile indicated a motivation for achievement were at greater risk for depression when faced with negative events that were achievement-related than when faced with interpersonal stress. In dependent individuals, the results were supportive but to a lesser extent. Brown, Hammen, Craske, and Wickens (1995), using subscales of the DAS based on the factor structure proposed by Beck et al. (1991), found that the Perfectionistic Achievement factor interacted with a congruent stressor, in this case outcome on a university examination, to predict exacerbations in symptoms of depression. Importantly, however, the researchers did not examine the impact of other stressors that were more interpersonal in nature to assess the specificity of the moderating role of the achievement diathesis uniquely on achievement-related stressors.

Conversely, research employing the DAS has also yielded findings that stand in opposition to the specific interaction hypothesis. Barnett and Gotlib (1990) found, counter to prediction, that the DAS Performance Evaluation subscale (rather than Approval of Others) interacted with social support to predict changes in depression. Such an interaction represents a mismatch between cognitive diathesis and life stressor. Also counter to the specific interaction hypothesis were the findings of Rude and Burnham (1993) revealing that an interpersonal (i.e., Approval by Others) subscale derived from the DAS did not interact with the frequency of interpersonal stressors to predict depressive symptomatology. Likewise, a DAS-derived achievement subscale (i.e., Performance Evaluation) did not interact with achievement-oriented stressors to predict symptoms of depression.

In light of the inconsistent results when examining the specific interaction hypothesis across cognitive theories of depression, as well as across age groups, and considering the case for congruency between diatheses and stressors when employing subscales extracted from the DAS, it was decided to employ the total CADAS score in the present studies. Several factors underpinned this decision. First, the methodology established by previous prospective tests of Beck's (1967, 1987) theory in adult samples (Abela & D'Alessandro, 2002; Barnett & Gotlib, 1988a, 1990; Dykman & Johll, 1998; Joiner et al., 1999; Kwon & Oei, 1992), was emulated, all of which employed the global DAS score as an assay of depressogenic schemata. Second, although Barnett and Gotlib (1990) proceeded beyond the global DAS score to examine subfactors intended to tap more specific autonomy-related and interpersonal vulnerabilities, their nonsupportive results of the specific interaction hypothesis, coupled with typically high correlations between the subfactors, led to their suggestion that "the DAS may be best employed as a unitary measure of vulnerability to depressive symptoms in response to negative interpersonal experiences" (p.57). The present finding of global CADAS scores that interact with parental reactions to children (which may be conceptualized as interpersonal experiences) to predict changes in depression levels appears to be in line with Barnett and Gotlib's (1990) suggestion.

Third, it is important to note that the originally developed construct of depressogenic schemata, as assessed with the DAS, was intended to be global with regard to the dysfunctional attitudes sampled and was not initially intended to highlight more specific vulnerabilities explicitly. In light of early reports, summarized by Barnett and Gotlib (1988b) and Haaga, Dyck, and Ernst (1991), that the DAS may not be effective as an index of cognitive vulnerability to depression when employed globally, researchers moved towards identifying item-groups within the DAS that intended to represent more circumscribed and predictive vulnerabilities (Dyck, 1992). More recently, however, the employment of more theoretically sensitive prospective methodologies that more validly examine diathesis-stress models of depression has yielded evidence that global assays of depressogenic schemata are indeed valid markers of vulnerability to depression (e.g., Abela & D'Alessandro, 2002; Dykman & Johll, 1998; Joiner et al., 1999; Kwon & Oei, 1992). Thus, while specifying the content of an individual's depressogenic schemata may be one approach to reconcile nonsupportive evidence regarding Beck's (1967, 1987) theory, the examination of global dysfunctional attitudes in theoretically-sound paradigms appears to be empirically supported as a fruitful alternative.

Fourth, the stressors assessed in the present studies, namely grade deficit scores and parental reactions to report cards, highlight a challenge that confronts researchers who examine congruency between cognitive diatheses and stressors. As discussed previously by investigators of specific interactions (e.g., Abela & Seligman, 2000; Kwon & Whisman, 1998), the classification of environmental events into strict and pure achievement and social categories based on the face validity of the stressor may be, at

times, an inexact process. For example, while the stress of a grade deficit score might seem at face value to be predominantly achievement-related, it is plausible that some individuals may construe this stressor as having a strong interpersonal component (e.g., by fearing disapproval of peers or family due to one's substandard performance). Similarly, the stressor of negative parental reactions to report cards may inherently represent both achievement and interpersonal themes, a duality that may be the norm rather than the exception. This ambiguity in the stressors employed, coupled with the lack of participants' subjective ratings of the achievement or interpersonal impact of the stressors, encouraged the present use of a global assay of dysfunctional attitudes.

Last, it is important to consider the present psychometric validation of the CADAS when examining its dimensionality. Using the discussion of Floyd and Widaman (1995) as a guide, the analysis of the scree plot of eigenvalues strongly suggests a unidimensional factor structure, with the first factor's value of 6.02 falling to an "elbow" at the second factor where the slope of the scree plot begins to approximate zero. As well, the alpha coefficient of .87, while not a direct index of unidimensionality (Schmitt, 1996), does indicate a relatively high degree of intercorrelation among the CADAS items. Further, it may be useful to examine the face validity of the CADAS items with significant loadings on the principal factor and with less significant loadings on subsequent factors. Of the 22 such finalized CADAS items, ten appear to be achievement-oriented, and eight appear to be interpersonal in nature (the remaining items are difficult to categorize dichotomously).⁹ This relatively balanced contribution

⁹ Post hoc exploratory regression analyses were conducted with a 10-item achievementoriented CADAS subscale (A-CADAS, items 3, 6, 7, 9, 10, 12, 14, 15, 19, 21), and with an 8-item interpersonally-oriented CADAS subscale (I-CADAS, items 1, 2, 4, 11, 13,

of items from both interpersonal conceptualizations and from achievement conceptualizations to the principal factor suggests that the distinction between sociotropy- and autonomy-related vulnerability constructs may not be particularly evident in this young sample. Subsequent research that specifically addresses this potential distinction in vulnerabilities is necessary to elucidate this matter, especially in younger individuals.

Strengths of the Present Research

The present studies feature a number of strengths that should be noted. First, it is the first attempt to develop and validate a measure of depressogenic schemata, operationalized as dysfunctional attitudes, that is designed specifically for use in children and adolescents. Although the adult DAS has been modified in some research to facilitate its administration to younger samples (e.g., Garber & Robinson, 1997; Garber, Weiss, & Shanley, 1993), the CADAS is the first instrument to undergo psychometric and construct validation as a specific tool to assess depressogenic schemata explicitly in children.

Second, the present research is the first explicit test of Beck's (1967, 1987) cognitive diathesis-stress theory in children and young adolescents, as well as the first to report strongly supportive results for the theory in this population. While other research has examined Beck's theory in 9th through 12th grade adolescents using a subset of

16, 18, 20). Subscales were formed by asking three judges to classify CADAS items into these two categories. An item was selected if all judges agreed on its categorization. The A-CADAS × GRDEF, A-CADAS × PRQ, I-CADAS × GRDEF, and I-CADAS × PRQ diathesis-stress interactions did not predict changes in depression at Times 2 or 3 in the sample of Study 2, both collapsing across age and with the sample split at its median age. The correlation between A-CADAS and I-CADAS was .58.

DAS items and has found results supportive of the theory at the level of a trend (Lewinsohn, Joiner, & Rohde, 2001), the present research is the first to extend examinations of the theory further to children as young as seven to eight years old.

Third, the prospective methodology employed in the present research allows for a more ecological and stringent test of Beck's (1967, 1987) diathesis-stress theory (Abramson et al., 1988; Alloy et al., 1988). The assessment of depressogenic schemata before the advent of a subsequent potential stressor emulates the natural course of events that Beck's theory posits leads to depression. According to the theory, individuals who normally carry the cognitive vulnerability of stable depressogenic schemata, or dysfunctional attitudes, and who subsequently experience negative life events will, as a consequence of the interaction between the vulnerability and the stressor, develop components of the negative cognitive triad that act as proximal, sufficient causes of depressive symptoms. Only a prospective methodology allows for a theoretically sound examination of this theory, affording the chronologically appropriate assessments of diatheses, stressors, depression levels, and of the negative cognitive triad. Further, a prospective design allows the measurement of depression over multiple time points, thus potentially affording an evaluation of more enduring depressed states as opposed to solely evaluating changes in depression levels immediately subsequent to the occurrence of a stressor.

Fourth, the use of a potentially negative life event that is uniform and that is temporally standardized for the entire sample, following the methodology of Hilsman and Garber (1995), carries with it the advantage of a more accurate and immediate stress assessment. The ability to measure parents' reactions to their children's report cards

immediately (the next morning) following the transpiration of this event reduces the strain on memory recall that is often problematic in retrospective assessments of multiple classes of life events (Alloy et al., 1988). As well, the fact that the same life event was assessed for every individual in the sample circumvents the issue of differentially weighting the impact of various life events when assessed using a "checklist" format that comprises a wide range of stressors. Using the children's receipt of report cards as a life event also affords the quantification of stress in a manner analogous to the midterm examination methodologies used to examine cognitive diathesis-stress theories of depression in other populations (e.g., Brown et al., 1995; Joiner et al., 1999; Metalsky, Abramson, Seligman, Semmel, & Peterson 1982; Metalsky et al., 1987, 1993).

Fifth, the present research is notable by virtue of its explicit use of specific theories of cognitive development and its invocation of tenets of developmental psychopathology in the construction of its hypotheses. Although previous work has founded an incorporation of knowledge of cognitive development into research of cognitive theories of depression (e.g., Abela, 2001; Nolen-Hoeksema et al., 1992; Turner & Cole, 1994), the present research builds upon this foundation and is novel in its invocation of a specific theory of cognitive development, that of Piaget (Flavell, 1963; Inhelder & Piaget, 1958; Piaget, 1967). Thus, this work strengthens the existing arguments of developmental psychopathologists (e.g., Garber, 2000; Garber & Flynn, 2001) that the transition to formal operational cognitive abilities may represent a key process in the emergence of cognitive vulnerabilities to depression. With the progression to formal operational thought, young individuals are freed cognitively from the constraints of concrete, empirical fact and may think "with an entirely new ability that detaches and liberates thinking from concrete reality and permits [them] to build [their] own reflections and theories" (Piaget, 1967, p.63). To the extent that depressogenic schemata, or dysfunctional attitudes, are viewed as one's own reflections and theories, beyond empirical or concrete reality, that pose a cognitive vulnerability to depression, the capacity to engage in formal operational thinking appears to be an important prerequisite to their existence.

Sixth, the present examination of Beck's diathesis-stress theory of depression in children carries the strength of an explicit examination all three components of the negative cognitive triad, namely views of the self, of the world, and of the future, as mediators of the relationship between the dysfunctional attitude × stress interaction and changes in levels of depressive symptoms. Importantly, previous longitudinal research has considered whether subsets of the components of the triad (Abela & D'Alessandro, 2002), general negative automatic thoughts (Kwon & Oei, 1992), as well as specific depressive versus anxious cognitions (Joiner et al., 1999) act as mediators. However, the present research is unique in its independent examination of each component of the triad as a mediator that may act as a proximal and sufficient factor in the emergence of depressive symptoms. Further, the present finding that, in children, a negative view of the self was the sole component of the triad that mediated the relationship between the diathesis-stress interaction and changes in depression implicates the child's view of oneself as a uniquely pernicious and toxic pathway to depression. One potential developmental explanation of this result is that, for newly emerging formal operational thinkers, only one's view of the self, and not as yet insufficiently salient constructs such as one's view of the world or of the future, impinges upon affective, physical, cognitive, and behavioural functioning to elicit depressive symptoms. Future research that attempts to replicate this unique role ascribed to negative thoughts of the self by examining all components of the triad as potential mediators may add evidence suggesting that negative self-views are a particularly caustic agent in the development of childhood depression.

Last, it is important to note the ethnic diversity presented by the samples studied herein. Considering both the sample for the psychometric validation of the CADAS and the sample used to test Beck's (1967, 1987) theory, a maximum of 32.4% of participants had family origins in the same geographical region. Further, four distinct geographical regions, namely the Caribbean, Southeast Asia, Europe, and the Indian Subcontinent, were each represented by a minimum of 10% of participants in both samples. As the issue of the cross-cultural generalizability of research into assessment, diagnosis, and treatment of psychopathology continues its move to the fore (e.g., Canino & Spurlock, 2000) the present findings suggest that depressogenic schemata may act as a cognitive vulnerability to depression in children and young adolescents across diverse cultural and ethnic groups.

Clinical Implications

The current research offers some potentially important clinical implications. Following the emergence of Beck, Rush, Shaw, and Emery's (1979) adult-based cognitive-behavioural therapy for depression, cognitive-behavioural practices intended explicitly for children have been developed within the last decade (e.g., Stark & Kendall, 1996; Stark, Sander, Yancy, Bronik, & Hoke, 2000). However, it seems that this extension to children has occurred under the assumption that depressogenic schemata act as cognitive vulnerabilities to depression in children, an assumption based upon the empirical support obtained for Beck's (1967, 1987) theory from adult-based research. The present research strongly supports the assumption guiding the practice of cognitive-behavioural psychotherapy for the treatment of depression in children as young as approximately 11 years. Specifically, the current work presents a validated instrument to assess children's depressogenic schemata that may be used to measure change in such schemata over the course of cognitive-behavioural treatment. This is especially relevant since "one of the ultimate goals of treatment [for depression] is changing dysfunctional schemas" (Stark et al., 2000, p. 212).

Second, the current research supports depressogenic schemata as cognitive vulnerabilities to depression that contribute to the onset of symptoms following the occurrence of negative life events. To the extent that these schemata are modified in cognitive-behavioural treatment, children may be less likely to experience future depressive episodes since the child's degree of vulnerability, as assessed by endorsement of CADAS items, may be attenuated. Thus, cognitive restructuring exercises such as evidence gathering and behavioural experiments to test children's dysfunctional attitudes may be fruitful techniques towards the objective of modifying these vulnerabilities to depression in children.

Third, children's views of the self may be a particularly relevant component of the negative cognitive triad to be assessed and targeted for treatment. The present research found that only this component of the triad acts as a mediator of the relationship between the depressogenic schemata × life stress interaction and changes in levels of depressive symptomatology. This suggests that practitioners of cognitivebehavioural therapy may augment the efficacy of treatment by paying greater attention to children's views of the self relative to their views of the world and of the future, by assessing the quality and quantity of such self-views, and by targeting them appropriately in treatment as potential proximal and sufficient causes of depression.

Last, the current work suggests that depressogenic schemata may not contribute to the emergence of symptoms of depression in children younger than approximately 11 years. It may be that children younger than 11 years have yet to sufficiently develop the formal operational cognitive faculties to engage in the abstract, hypothetico-deductive thinking that may underpin the function of depressogenic schemata. Thus, the targeting of such schemata in the cognitive-behavioural treatment of depression in children younger than approximately 11 years may not be fruitful in light of the present findings. Preformal operational children may profit more efficiently from a predominantly concrete, here-and-now treatment orientation that does not address the abstract, hypothetical contingencies that are inherent in CADAS items.

Limitations and Future Directions

Some limitations of the present studies should be noted, some leading to suggestions for subsequent research. The samples examined were nonclinical in nature, and explicit diagnoses of affective disorders were not made. Consequently, these findings may be limited to the development of relatively mild forms of depression. The processes implicated in the changes in depressive symptomatology in nonclinical community samples are not necessarily equal to those processes implicated in diagnosed clinical samples. Thus, as emphasized by Joiner et al. (1999), the generalization of findings obtained from nonclinical analogs of depression to clinical depression should be met critically.

Depressive symptoms were assessed through a self-report methodology. Although the Children's Depression Inventory (Kovacs, 1980-1981, 1985) is an instrument with demonstrated construct validity, and although previous work (e.g., Hilsman & Garber, 1995; Kazdin, 1981) has suggested that affected children tend to hold the most pertinent information regarding internalizing symptoms such as those typically manifested in major depressive disorder and in dysthymic disorder, it is important to ascertain whether the interaction between depressogenic schemata and negative life events would predict changes in depression as rated by experienced clinicians or as measured by interview-based diagnostic strategies. Similarly, one of the stressors employed in the present research was measured by children's reports of their parents' reactions to their academic performance. To echo the position of Hilsman and Garber (1995), it would be useful to obtain parents' self-reported reactions to their children's report card performance, or to obtain the ratings of independent observers. This would afford an examination of potential biases in the reporting of life stress, and the role that depressogenic schemata and depressive symptoms might play in such biases.

Another limitation may be inherent in the use of parents' reactions to report cards as a negative life event. As previously mentioned, this assay of stress encompasses both achievement- and interpersonal-related domains, thus being

ambiguous regarding its categorization as an achievement- or interpersonally-related stressor. Although not empirically examined in the present studies, such ambiguity in stressors presents a challenge for researchers who examine the specific interactions between achievement- or interpersonally-related cognitive vulnerabilities and matching negative life events. A more thorough and explicit assessment of the subjective meaning, interpretation, and domain-specificity ascribed to the stressor by each individual may be one manner to facilitate the determination of whether the stressor is viewed as a threat to the realm of autonomy, sociality, or both.

Caution must also be exercised when inferring the cognitive capacities of individuals based solely on chronological age. As noted earlier, the original age ranges postulated by Piaget (Flavell, 1963; Inhelder & Piaget, 1958; Piaget, 1967) to characterize various stages of cognitive development have been examined by numerous researchers (e.g., Commons, Miller, & Kuhn, 1982; Shayer & Wylam, 1978). To reiterate, the results suggest that, with specific regard to the formal operational stage, some individuals may not acquire a mastery of formal operational concepts until well later than Piaget theorized. Conversely, other researchers (e.g., Kuhn, Ho, & Adams, 1979; Stone & Day, 1978) have suggested that Piaget may have underestimated the cognitive capacities of concrete operational children (e.g., those aged 9 or 10 years), maintaining that some individuals may engage in formal operations at an earlier age than Piaget theorized. Thus, with regard to Study 2, one cannot be certain that the median-split older children are undoubtedly fully formal operational. Likewise, the younger subsample cannot be inferred to be purely preformal with regard to cognitive development. Researchers may wish to address this limitation by attempting to explicitly assess participants' cognitive capacities with tasks that test formal operational reasoning, such as those discussed by Inhelder and Piaget (1958).

Last, the dysfunctional attitude × stress interaction term accounted for a relatively small percentage of the variance in changes in depression levels, with Time 1 depression level by far accounting for the greatest amount of variance. Although findings of this magnitude tend to be the norm in such research, these modest effects point to the impact of other factors besides depressogenic schemata and life stress in the development of depressive disorders. It behooves future researchers to consider other etiological variables, cognitive and otherwise, in concert with depressogenic schemata to attempt to foster a more holistic comprehension of the onset of depression, in children and across the lifespan.

Summary and Conclusion

To conclude, the present research introduces the first self-report questionnaire that measures depressogenic schemata, or dysfunctional attitudes, in children and young adolescents. The CADAS demonstrates respectable psychometric properties as well as good divergent validity with respect to other childhood depression constructs. Supporting Beck's (1967, 1987) cognitive diathesis-stress theory of depression, only children who endorsed high degrees of dysfunctional attitudes and who subsequently experienced a stressful event showed increases in levels of depressive symptomatology five days after the stressor's occurrence. As predicted, subsequent analyses revealed that this dysfunctional attitude × stress interaction was predictive of increases in depression only in children aged 11-12 years and older, supporting an incorporation of normative cognitive developmental theory into cognitive theories of depression. This suggests that children must be capable of formal operational cognitive processes for hypothetical and abstract dysfunctional attitudes to meaningfully moderate the impact of life stress. The relationship between the diathesis-stress interaction and changes in levels of depressive symptoms was mediated by negative views of the self. This supports the contention of Beck's theory that the moderation of a life stressor's impact by dysfunctional attitudes leads to a negative self-view, which in turn acts as a proximal and sufficient cause of elevations in depressive symptomatology. Negative views of the world and of the future did not act as mediators.

This research is the first to yield a validated instrument that is designed to assess dysfunctional attitudes in children and young adolescents specifically. Through a consideration of normative cognitive developmental processes, these findings are also the first to indicate that dysfunctional attitudes play an important role in the etiology of depression in children as young as 11 years. Further, this work may have important implications for the cognitive-behavioural treatment of childhood depression, a treatment that includes as primary objectives the modification of dysfunctional attitudes, and of negative views of the self, to attenuate the risk of the future emergence of symptoms of depression.

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Item-total Correlations, Principal Components Analyses, Internal Consistency, and Test-retest Reliability for the 22-item CADAS

			Principal comp	ponents analyses				
	Item-te	otal <i>r</i>	Loadings on J	Loadings on principal factor				
Item	Scale validation	Replication	Scale validation	Replication				
1	.40	.43	.45	.47				
2	.50	.44	.55	.49				
3	.39	.44	.44	.53				
4	.39	.25	.43	.28				
5	.39	.40	.45	.46				
6	.46	.53	.51	.61	(table continues)			

			Principal comp	oonents analyses	
	Item-to	otal <i>r</i>	Loadings on p	principal factor	
Item	Scale validation	Replication	Scale validation	Replication	
7	.42	.32	.49	.38	
8	.46	.43	.56	.52	
9	.46	.41	.54	.50	
10	.46	.36	.52	.43	
11	.50	.39	.60	.50	
12	.50	.39	.61	.50	
13	.43	.48	.51	.55	
14	.51	.41	.60	.49	(table continues

	Item-te	otal r		
			Loadings on p	principal factor
Item	Scale validation	Replication	Scale validation	Replication
15	.42	.46	.50	.55
16	.43	.39	.52	.47
17	.40	.50	.51	.61
18	.47	.48	.52	.53
19	.50	.54	.55	.60
20	.49	.50	.54	.57
21	.41	.36	.46	.42

Principal components analyses

(table continues)

			Principal comp	ponents analyses	
	Item-to	otal <i>r</i>	Loadings on j		
Item	Scale validation	Replication	Scale validation	Replication	_
22	.53	.52	.59	.58	_
a	.87	.85			
Mean ii item <i>r</i>	nter24	.22			
Test-ref	test r .80				
Eigenva	alue		6.02	5.66	
Percent varianc	e		27.37	25.70	(table continue

Note. Scale validation sample: N = 453; Replication sample: N = 241; CADAS = Child and Adolescent Dysfunctional Attitudes Scale.

See Appendix A for CADAS items.

Divergent Validity of the CADAS, Intercorrelations Between All Measures, and Descriptive Statistics: Study 1

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13
1. CADAS	_	.30**	08	.29**	.41**	.23**	.31**	.06	.32**	58**	.26**	.15	19**
2. CDI		-	- .47**	.57**	.74**	.71**	.57**	.10	.54**	50**	.54**	34**	.07
3. PA			-	33**	48**	48**	41**	.03	38**	.41**	53**	.20*	18**
4. NA				_	.51**	.48**	.45**	.22*	.50**	32**	.31**	19*	06
5. NTS					-	.66**	.61**	.03	.54**	60**	.48**	26**	03
6. NTW						_	.57**	11	.52**	42**	.54**	40**	.19**
7. NTF							-	05	.40**	59**	.34**	12	10*
8. DEP								-	.21*	_ ^a	_ ^a	_ ^a	19*
9. SC									-	_ ^a	_ ^a	^a	04
10. SES										-	_ ^a	_ ^a	.07
11. NEU											_	_ ^a	.08
12. CSDS												-	28**
13. AGE													
M	55.01	8.63	43.48	28.18	15.81	18.19	16.67	22.23	16.63	32.33	28.53	18.05	142.32
SD	16.02	6.48	9.10	10.00	3.82	3.86	4.02	4.58	3.53	4.48	5.94	10.05	18.93

(table continues)

Note. CADAS = Child and Adolescent Dysfunctional Attitudes Scale; CDI = Children's Depression Inventory; PA = Positive Affect subscale of Positive and Negative Affect Scale for Children (PANAS-C); NA = Negative Affect subscale of PANAS-C; NTS = Negative Thoughts of Self subscale of Cognitive Triad Inventory for Children (CTI-C); NTW = Negative Thoughts of World subscale of CTI-C; NTF = Negative Thoughts of Future subscale of CTI-C; DEP = Dependency subscale of Depressive Experiences Questionnaire for Adolescents (DEQ-A); SC = Self-criticism subscale of DEQ-A; SES = Rosenberg Self-esteem Scale; NEU = Neuroticism subscale of Big Five Personality Questionnaire – Revised Child Version; CSDS = Children's Social Desirability Scale; AGE = Age in months. DEP, SC: n = 118; SES: n = 102; NEU: n = 105; CSDS: n = 128.

^a Correlation not available since participants completed only one scale among the DEQ-A, SES, NEU, and CSDS.

p*<.05. *p*<.01.

Subject	Acceptable Grade	Actual Grade	Deficit
English	B+ (10)	C (6)	4
Second Language	B (9)	A- (11)	-2
Math	C (6)	C (6)	0
Science	A- (11)	B+ (10)	1
Social Studies	B+ (10)	B- (8)	2
Heath/Physical Education	A (12)	A- (11)	1
Total Grade Deficit Score			6

Sample Calculation of Grade Deficit Score

Note. The academic subject areas listed in this table are the six core subject areas for students in grades 3 through 6. Due to different curricula, for students in grades 7 and 8 the latter two subjects were History and Geography. In all cases, the Second Language was French.

Intercorrelations Between All Measures, Means, and Standard Deviations: Study 2

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13
1. CADAS		.32**	.24**	.21**	.29**	.22**	.36**	.27**	.27**	.28**	.07	.19**	23**
2. T1 CDI			.70**	.65**	.69**	.64**	.58**	.63**	.60**	.53**	.28**	.13	12
3. T2 CDI			-	.79**	.78**	.76**	.66**	.68**	.60**	.56**	.39**	.12	05
4. T3 CDI				-	.68**	.66**	.59**	.86**	.74**	.71**	.35**	.10	.01
5. T2 NTS					-	.76**	.77**	.75**	.59**	.62**	.32**	.05	08
6. T2 NTW						-	.67**	.60**	.73**	.57**	.34**	.05	00
7. T2 NTF							-	.67**	.53**	.74**	.31**	.07	15*
8. T3 NTS								-	.73**	.77**	.27**	.05	03
9. T3 NTW									-	.69**	.23**	.01	.11
10. T3 NTF										-	.24**	.02	07
11. PRQ											-	.39**	.18**
12. GRDEF												_	.13*
13. AGE													_
M	54.66	8.29	6.58	5.82	15.66	17.60	16.45	15.02	16.49	15.87	6.32	6.39	135.66
SD	14.77	6.69	6.63	6.84	4.14	4.16	4.37	4.02	3.88	4.42	5.01	14.46	19.95

(table continues)

Note. T1 = Time 1; T2 = Time 2; T3 = Time 3; CADAS = Child and Adolescent Dysfunctional Attitudes Scale; CDI = Children's Depression Inventory; NTS = Negative Thoughts of Self subscale of Cognitive Triad Inventory for Children (CTI-C); NTW = Negative Thoughts of World subscale of CTI-C; NTF = Negative Thoughts of Future subscale of CTI-C; PRQ = Parental Reaction Questionnaire; GRDEF = Grade deficit score; AGE = Age in months.

p*<.05. *p*<.01.

Results of Hierarchical Regression Analyses: Dysfunctional Attitudes Interacting with Parental Stress to Predict Changes in

Depression from Time 1 to Times 2 and 3

		Ti	me 2		Time 3					
	Chang	ge			Change					
Order of entry	in R^2	F change	df	pr	β	in R^2	F change	df	pr	β
1. Time 1 CDI	.49	225.78***	1, 239	.70	.70	.43	178.99***	1, 239	.65	.65
2. PRQ	.04	20.15***	1,238	.28	.21	.03	13.16***	1,238	.23	.18
3. CADAS	.00	.35	1,237	.04	.03	.00	.00	1,237	.00	.00
4. PRQ x CADAS	.00	1.25	1,236	07	05	.01	5.18*	1,236	.15	.11

Note. CDI = Children's Depression Inventory; PRQ = Parental Reaction Questionnaire; CADAS = Child and Adolescent Dysfunctional Attitudes Scale.

p*<.05. **p*<.001

Results of Median Age-Split Hierarchical Regression Analyses: Dysfunctional Attitudes Interacting with Parental Stress to Predict Changes in Depression from Time 1 to Time 3

		У	ounger	Older						
	Chang	ge				Chang	ge			
Order of entry	in R^2	F change	df	pr	β	in R^2	F change	df	pr	β
1. Time 1 CDI	.46	99.45***	1, 118	.68	.68	.37	70.49***	1, 119	.61	.61
2. PRQ	.01	2.04	1, 117	.13	.10	.09	19.05***	1, 118	.37	.31
3. CADAS	.01	.99	1, 116	09	07	.01	2.13	1, 117	.13	.10
4. PRQ x CADAS	.00	.16	1, 115	.04	.03	.04	10.14**	1, 116	.28	.22

Note. CDI = Children's Depression Inventory; PRQ = Parental Reaction Questionnaire; CADAS = Child and Adolescent Dysfunctional Attitudes Scale; Younger = age through 136 months, n = 120; Older = age 137 months and above, n = 121. **p < .01. **p < .001

Figure 1



Figure 1. Residual change in standardized depression scores as a function of dysfunctional attitudes and parental stress, collapsing across age.

Figure 2



Figure 2. Residual change in standardized depression scores in median-split older children (11 years, 5 months and up) as a function of dysfunctional attitudes and parental stress.

Appendix A

Child and Adolescent Dysfunctional Attitudes Scale (CADAS)

Different people think in different ways and believe different things. We want to know what you think too. You are going to read a group of sentences. Tell us how much you agree with each sentence by choosing either *Strongly disagree, Mostly disagree, Disagree a bit, Agree a bit, Mostly agree,* or *Strongly agree* under each sentence. Remember that there are no right or wrong choices since everybody thinks in different ways.

1. People will like me only if I am always good.

1	2	3	4	5	6
Strongly disagree	Mostly disagree	Disagree a bit	Agree a bit	Mostly agree	Strongly agree

- 2. I can be happy only if everybody I know likes me.
- 3. People who have bright ideas are more important than people who don't have bright ideas.
- 4. What other people think about me is very important.
- 5. Good-looking people are happier than ugly people.
- 6. Young people have to be the best at everything they do.
- 7. When people don't get what they want, they have to get upset.
- 8. If I say one thing that is dumb, it means I am a dumb person.
- 9. Whenever I make a mistake, bad things will always happen.
- 10. I have to be better than other kids.
- 11. If one person <u>doesn't</u> love me, nobody will ever love me.

- 12. If I fail once, I will always fail.
- 13. If I disagree with other people, then they will hate me.
- 14. If I can't do something perfectly, I shouldn't even try to do it.
- 15. When I make a mistake, I should get mad at myself.
- 16. It is more important to do what other people want me to do than what I want to do.
- 17. If I need help, it means that I am dumb.
- 18. I can feel good only when other people say nice things about me.
- 19. I have to be good at everything I try.
- 20. You have to impress other kids for them to like you.
- 21. I should always be able to solve my problems all by myself.
- 22. I have to be the best in at least one thing for other people to like me.

Note. Adaptation and extension of the Dysfunctional Attitudes Scale (DAS; Weissman,

1979, Weissman & Beck, 1978).

Appendix B

Certificate of Ethical Acceptability of Research Involving Humans from the McGill University Research Ethics Board II

Please refer to the following page.