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## Cognitive Organization, Perceptions of Parenting and Depression Symptoms in Early Adolescence

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Cognitive Organization, Perceptions of Parenting, and Depression Symptoms  
in Early Adolescence

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### Abstract

Despite its strong relation to depression and theorized development across childhood and adolescence, cognitive schema organization has not been explored in early adolescence, a sensitive developmental period for first depression onset. Schema organization is theorized to derive from childhood cognitive internalizations of caregiving relationships, such as critical parenting experiences (e.g., Young, Klosko, & Weishar, 2003). Thus, the current investigation considers the organization of positive and negative schemas with youth's perceptions of parental responsiveness and psychological control and self-reported emotional functioning. Participants were 198 boys and girls aged 9 to 14 years who completed the Psychological Distance Scaling Task, measures of perceptions of parenting behaviors, anxiety symptoms and depression symptoms. Consistent with hypotheses, higher depression, but not anxiety symptoms were associated with a loosely-interconnected *positive* schema organization and a tightly- interconnected *negative* schema organization. Parental responsiveness emerged as the strongest predictor of negative schema structure. Implications for cognitive-developmental theories of depression and early identification of depression risk are discussed.

### **Cognitive Organization, Perceptions of Parenting and Depression Symptoms in Early Adolescence**

Researchers investigating etiologic models of depression have increasingly recognized the importance of examining the development of depression in its early child and adolescent stages. Approximately nine percent of youth will experience at least one significant episode of Major Depressive Disorder by age 14 (MDD; Lewinsohn, Rohde, Seeley, & Fischer, 1993) and between 20% and 59% of adolescents experience prolonged periods of subsyndromal depressed mood (Compas, 1997). Depression symptoms prior to adolescence are a strong predictor of later mood disorder (Harrington, Fudge, Rutter, Pickles, & Hill, 1990) and rates of MDD increase dramatically in adolescence (Hankin et al., 1998). Impairing on their own, depression symptoms during adolescence are also strongly associated with later diagnoses of MDD (Forsell, 2007; Georgiades, Lewinsohn, Munroe, & Seeley, 2006).

Beck's (1987) cognitive model of depression highlights negative cognitive schemas or core beliefs about self as prominent diatheses for depression. Though Beck's model was originally applied primarily to adults, it has been increasingly and successfully applied to youth (e.g., Bruce et al., 2006). Cross-sectional investigations (Bruce et al., 2006; Garber, Weiss, & Shanley, 1993; Gladstone & Kaslow, 1995; Kercher, Rapee & Schniering, 2009; Lumley & Harkness, 2007; Rudolph, Hammen & Burge, 1997) and prospective investigations (Hankin, Lakdawalla, Lee, Grace & Roesch, 2004; Lewinsohn, Joiner & Rhode, 2001) have consistently supported the idea that cognitive schema content may be a diathesis for childhood emotional disorders. Much less examined in this developmental work is how schema content is organized or structured in the mind (e.g., how interconnected a negative schema is with other negative schema content)

despite cognitive organization's strong relation to adult and late adolescent depression and its theorized development across childhood and adolescence (Dozois & Beck, 2008; Lumley & Harkness, 2009). Researchers have also stressed the importance of examining developmental origins of cognitive vulnerabilities to depression (e.g., Alloy, Abramson, Smith, Gibb, & Nereen, 2006). Thus, the current investigation examines how the organization of cognitive schemas relates to perceptions of parenting and depression symptoms in early adolescence.

### **Cognitive Organization and Youth Depression Symptoms**

Four interrelated elements of cognition are theorized to underscore depression including cognitive content, structure, operations and products (Ingram, Miranda, & Segal, 1998; Ingram & Kendall, 1986). According to cognitive formulations of psychopathology (Beck 1967; 1976; Ingram et al., 1996) cognitive content related to self is captured by the concept of schemas (i.e., organized and generalized core beliefs about self, e.g., "I am a failure"), dysfunctional attitudes (i.e., irrational beliefs and assumptions about the world, e.g., "If a person asks for help, it is a sign of weakness"; Weissman & Beck, 1978) and automatic thoughts (i.e., spontaneous negative self-statements, e.g., "What's the matter with me?"; Hollon & Kendall, 1980). The current study is aimed at the level of schema content and organization, or cognitive structure. Schema content comprises beliefs about self that are stored in memory and can reflect a variety of positive or negative themes (e.g., "I am trustworthy", "I am no good"). Schema structures represent how information related to the self is organized in the mind in relation to all other self-relevant information. Cognitive theory suggests that schemas are important for determining how children come to interpret life experiences and understand

self in relation to others. How schema contents are organized in the mind is important for determining vulnerability to psychopathology by influencing how accessible, easily activated, and influential the schema content will be (Collins & Loftus, 1975; Bower, 1981). If a child believes he or she is unlovable, defective, or isolated, *and* this is represented in a tightly-interconnected schema network, the activation of this negative schema content is theorized to confer risk for increased dysphoria and a potentially spiraling negative mood in the face of stressful life events. In some vulnerable youth, dysphoria and depression symptoms intensify into the development of major depressive disorder, an often chronic mental health concern.

Cognitive organization appears to be an important construct related to depression and anxiety in late adolescence and adulthood. Tightly-interconnected negative schema organization predicts both anxiety and depression and loosely-interconnected positive schema organization demonstrates specificity to depression (Dozois, 2007; Dozois & Dobson, 2001a, 2001b, 2003; Dozois & Frewen, 2006; Lumley & Harkness, 2009; Segal, Gemar, Truchon, Guirguis, & Horowitz, 1995; Segal, Hood, Shaw, & Higgins, 1988). Longitudinal investigations of schema organization in depression demonstrate that cognitive organization is stable between depressive episodes, supporting the theory that these structures are enduring (Dozois & Dobson, 2001a; Dozois, 2007; Seeds & Dozois, 2010). However, to date, research has not explored cognitive schema organization in early adolescence, a sensitive period for first depression onset. Also, research has not addressed whether schema organization contributes significantly to the understanding of depression symptoms in youth beyond what can be predicted by knowledge of schema content alone. This question is both conceptually and practically important.

### **Perceptions of Parenting and Cognitive Organization**

Increasingly, researchers are considering the importance of potential developmental origins of cognitive vulnerabilities to depression including childhood maltreatment, parental responsiveness and psychological control, and parental modeling (for reviews, see Alloy et al., 2006; Hankin, Oppenheimer, Jenness, Barrocas, Shapero, & Goldband, 2009). Cognitive vulnerability to depression does not develop in a vacuum and is likely influenced by environmental inputs. Theory suggests that parent behaviors are important inputs in this regard and, specifically, that children internalize parent messages and behaviors in the form of core beliefs or cognitive schemas about the self and the world (e.g., “I am unlovable”, “Others cannot be trusted”), generating a way of thinking and relating that creates vulnerability for psychopathology (Young et al., 2003).

Consistent with theory, a growing body of research supports the notion that negative schema content is a mediator between childhood maltreatment and psychopathology (Gibb, Abramson, & Alloy, 2001; Harris & Curtain, 2002; Harmelen, Jong, Glashouwer, Spinhoven, Pennix & Elzinga, 2010; Lumley & Harkness, 2007). Much less examined are potential developmental origins of depressotypic cognitive organization. In one exception, Lumley & Harkness (2009) demonstrated that cognitive organization was linked to experiences of childhood emotional and physical abuse in young adults. Parenting research suggests that even comparatively more subtle and widely experienced forms of negative parenting are implicated in models of risk. Parental responsiveness and control have been highlighted as important for generating cognitive styles (Alloy et al., 2001; Garber & Flynn, 1998) and predicting risk for psychopathology

(Barber & Harmon, 2002; Garber, Robinson & Valentiner, 1997; Stice, Barrera & Chassin, 1993; Vostanis, Nicholls & Harrington, 1994).

Baumrind's model, which includes parental responsiveness and control, is a widely used framework for understanding parenting behaviours. Parent responsiveness refers to parents being, "attuned, supportive, and acquiescent to children's special needs and demands" (Baumrind, 1991, p. 62). Parent control encompasses both behavioral and psychological aspects. Psychological control refers to "manipulative parental behavior that intrudes upon the child's psychological world" (e.g., shaming the child; Soenens, 2010, p. 74). Given that previous research suggests a strong association between psychological control and the internalized sense of self (e.g., Barber & Harmon, 2002), we focused on psychological versus behavioural control in this investigation. Consistent with parenting theory which considers moderators of overall parenting styles, such as authoritative parenting (low responsiveness, high control), we also examine the interaction between responsiveness and control in our model. Research on parenting behaviours typically solicits information exclusively on mother behaviour. A strength of the current study is that youth were asked to report on both mother *and* father responsiveness and psychological control, allowing for a more holistic view of the child's parenting environment.

Although cognitive schemas are thought to emerge in childhood and become increasingly stable throughout adolescence (Abela & Hankin, 2005), the current study is the first to examine cognitive schema organization and its relation to depression in this early adolescent period. We hypothesized that: 1) both more tightly interconnected negative schema organization (NSO) and more loosely interconnected positive schema



organization (PSO) (i.e., referred to as a depressotypic cognitive organization) would be associated with higher depression symptoms; 2) NSO would relate to anxiety and depression symptoms but depression specificity would emerge with PSO related to depression symptoms only; 3) NSO and PSO would explain significant variance in depression symptoms beyond that of schema content alone, and; 4) depressotypic schema organization would be associated with low levels of parental responsiveness, high levels of parental psychological control in a multivariate model of depression risk that includes a parental responsiveness by psychological control interaction.

## **Method**

### *Participants*

All students in four participating elementary schools in grades 5 to 8 (ages 9 to 14) were asked to bring home an information and consent package for parents to review. Of the 965 parents sent information packages, 689 (71%) did not respond by the deadline, 7 indicated they did not wish their child to participate and 269 consented (28%). However of the 269 children for which we obtained parental consent we were left with a sample of 198 youth due to student absence, unwillingness to participate, or missing data. For youth missing less than 15% of data, mean estimates for each participant were used to replace missing values. Participants were elementary school girls ( $n = 103$ ) and boys ( $n = 95$ ) ranging in age from 9 to 14 ( $M = 11.57$ ,  $SD = 1.02$ ) years. Consistent with the demographics of this southwestern Ontario city, the majority of the sample reported ethnicity as Caucasian ( $n = 158$ , 80%) followed by Asian ( $n = 19$ , 10%), Black ( $n = 4$ , 2%), First Nations ( $n = 4$ , 2%), Hispanic ( $n = 5$ , 3%), or other ( $n = 10$ , 5%). Two participants did not report ethnicity. Given that so few participants were represented in

these various ethnic categories, subsequent analyses that involved ethnicity collapsed this variable into two categories: Caucasian ( $n = 158$ , 80%) and diverse ethnicity ( $n = 40$ , 19%).

### *Measures*

**Depression Symptoms.** The Children's Depression Inventory (CDI; Kovacs, 1981) is a 27-item self-report scale used to measure depressive symptoms in youth. Given the inability to quickly and properly identify youth who might be at risk for suicide, a decision was made to delete the suicide item from the inventory, yielding a total of 26 items for the current study. Youth were asked to endorse one of three statements on a rating scale corresponding to scores ranging from 0 (*no or low symptom*) to 2 (*severe form of symptom*). A higher score on the CDI indicates higher levels of depression symptoms. Adequate test-retest reliability and internal consistency have been established across a number of studies (Saylor, Finch, Spirito, & Bennett, 1984). Internal consistency reliability (coefficient alpha) was .90 in the current sample.

**Anxiety Symptoms.** The Multicomponent Anxiety Scale for Children-10 (MASC-10; March 1997) is a 10-item shortened form of the more extensive Mood and Anxiety Scale for Children (March, 1997) and was used to measure anxiety symptoms in youth. Participants responded to the each item using a 4-point Likert-type scale ranging from 0 (*never true about me*) to 3 (*often true about me*). Higher scores indicated higher anxiety symptoms. Psychometric research suggests that this scale possesses adequate internal consistency and discriminates well between individuals with anxiety disorders and other forms of psychopathology (March, Parker, Sullivan, Stallings, & Conners,

1997). Internal consistency reliability for the MASC-10 in current study was adequate ( $\alpha = .74$ ).

**Schema content.** The Schema Questionnaire for Children (SQC; Stallard & Rayner, 2005) assesses early maladaptive schemas based on Young's model (Young, 1990; Young et al., 2003) including negative themes such as social isolation/alienation, mistrust/abuse, dependence/incompetence, vulnerability to harm/or illness, emotional deprivation, subjugation, and defectiveness/shame among others. Participants were asked to rate how much they agreed with 13 schema statements (e.g., "I am no good") on a 6-point Likert-type scale, ranging from 1 (*strongly disagree*), to 6 (*strongly agree*) with higher scores indicating higher levels of maladaptive schema content. Previous research with the SQC has established adequate convergent validity with the Young Schema Questionnaire short-form from which the SQC was derived (Stallard & Rayner). Research also suggests that this scale discriminates well between clinical and community samples of youth (Stallard, 2007). Internal consistency reliability for the SQC in the current study was .76. Concurrent validity of this measure was also supported as higher maladaptive schema scores were associated with greater depression symptoms in youth ( $r = .48$ ).

**Schema structure.** The Psychological Distance Scaling Task (PDST; Dozois & Dobson, 2001a, b) was used to measure the organization of positive and negative cognitive content. In this computer administered task, participants were presented with a 16 x 16cm<sup>2</sup> grid, divided into four quadrants bisected by two dimensions; self-descriptiveness on the x axis (ranging from *not at all like me* to *very much like me*) and valence on the y axis (ranging from *very positive* at the top of the grid to *very negative* at

the bottom). Following detailed instructions and numerous examples, participants were randomly presented with a series of positive and negative adjectives and asked to consider both how self-descriptive and how positive or negative each adjective was. Participants indicated this rating by clicking on the point on the grid corresponding to both dimensions. Stimuli consisted of 28 adjectives (14 positive, 14 negative; e.g., “kind”, “smart”, “bossy”, “rude”) containing interpersonal and achievement themes that have been used in previous cognitive research with youth (e.g., Hammen & Zupan, 1984). If participants were unsatisfied with their first rating, they were able to modify their response prior to completing the next trial.

Consistent with past uses of the PDST, only adjectives that were plotted in the self-descriptive quadrants were considered for analysis (Dozois & Dobson 2001a; b). At the end of the task, participants had varying numbers of adjectives organized in various fashions in the two self-descriptive quadrants. The organization of self-descriptive positive adjectives is referred to as positive schema organization or PSO, and negative as negative schema organization or NSO. NSO and PSO were determined by computing the square root of the sum of squares for each quadrant using the following formula:

$$\sqrt{\frac{\sum (X_1 - X_2)^2 + (X_1 - X_3)^2 + \dots + (X_{13} - X_{14})^2 + (Y_1 - Y_2)^2 + (Y_1 - Y_3)^2 + \dots + (Y_{13} - Y_{14})^2}{n(n-1)/2}}$$

By computing the sum of squares for all data points in each quadrant (positive self-descriptive and negative self-descriptive) we are left with two measures of interconnectivity. The higher the schema organization score, the more interstimulus distance between adjectives; thus, the less interconnected. The lower the schema organization score, the less interstimulus distance between adjectives; thus, the more

interconnected. The PDST has demonstrated adequate convergent and divergent validity with respect to measures of depression, anxiety, and cognitive vulnerability to depression in adult samples (e.g., Dozois & Dobson, 2001a,b).

**Child-reported Parent Behaviour.** To assess participants' perceptions of parenting behaviors, subscales from the shortened version of the Child Report of Parent Behavior Inventory (CRPBI; Schludermann & Schludermann, 1988) related to responsiveness (e.g., "My mother makes me feel better after talking over my worries with her") and psychological control (e.g., "My father brings up past mistakes when he criticizes me") were administered. Participants were asked to indicate the extent to which they agreed with 14 statements for each of their mother and father on a scale ranging from 1 (*disagree*) to 5 (*agree*). For each subscale, an average of the ratings formed the final score. To increase power for detecting significant effects in our primary analyses we formed composite variables of maternal and paternal ratings yielding a parental responsiveness and parental psychological control variable. We also centred all variables and created an interaction term (responsiveness X psychological control) to include in our model.

The CRPBI has demonstrated good reliability, internal consistency (Schludermann & Schludermann, 1970) and convergent and discriminant validity (Fauber, Forehand, Thomas, & Wierson, 1990). In the present study, the internal consistency reliability for parental responsiveness ( $\alpha = .90$ ) and psychological control ( $\alpha = .81$ ) were acceptable.

**Procedure**

Undergraduate research assistants visited each participating classroom to introduce the study to the youth and encourage them to give the information package to parents. All testing occurred during the school day in an assigned area at each participating school (e.g., gymnasium, library, technology room). Each room was set up with 25 Acer Aspire netbook computer stations. Each station was comprised of desks or tables with a netbook, mouse, privacy shield and chair for each participant. Groups ranging from 10 to 25 students completed the computerized questionnaires and tasks during 1-hour blocks of time. A minimum of five research assistants were present at each data collection session to give group instructions and to provide students with individual assistance as needed. Youth were given the opportunity to consent to participate following verbal and written information about the study presented in the first few minutes of each data collection session. To promote maximum help-seeking when needed, research assistants would also frequently inquire if students had any questions and tried to make themselves generally available for questioning. Upon study completion, participants were thanked and given an edible treat or toy for their participation.

**Results****Descriptive Characteristics**

Means and standard deviations for all study variables for the total sample and by sex and ethnicity are presented in Table 1.

**Mood and Anxiety Symptoms.** Symptom scores assessed by the CDI ranged from 0-33, with 8% of the sample falling in a clinically elevated range. Anxiety symptom scores assessed by the MASQ-10 ranged from 1-26, with 16% of the sample falling in a

clinically elevated range. Depression scores did not relate to sex or age (all  $p$ 's  $> .05$ ) but did relate to ethnicity,  $t(196) = -2.16, p = .03$ . Anxiety scores did not relate to age or ethnicity, but did relate to sex,  $t(139) = 2.49, p = .01$

**Schema Content and Organization.** Negative schema content as assessed by the SQC ranged from 20 to 70. Consistent with previous research, higher negative schema scores were associated with higher depression scores ( $r = .48$ ). Negative schema content was not significantly related to sex or age but was significantly related to ethnicity,  $t(190) = -2.86, p = .005$ .

Of the 198 participants with measures of Positive Schema Organization (PSO), depression and all parenting variables, only 158 also had measures of Negative Schema Organization (NSO). This indicated that 40 participants did not rate more than one negative adjective as self-descriptive. Rather than eliminating all participants without an NSO score, we retained all participants who possessed a PSO score and measures of all other central study variables. This is reflected in different numbers of participants for analyses involving NSO or PSO. Consistent with previous research with the PDST, NSO and PSO variables were extremely positively skewed and logarithmic transformations were applied. Transformed NSO ranged from .01 to 2.37 and transformed PSO from .01 to 1.30. Neither NSO or PSO were significantly related to sex, age or ethnicity (all  $p$ 's  $> .05$ )

**Perceptions of Parenting.** Parental responsiveness ranged from 3.83 to 10 and Parental psychological control ranged from 2 to 9.25. Consistent with previous research, higher depression symptoms were significantly associated with lower levels of parental responsiveness ( $r = -.50, p < .001$ ) and higher levels of psychological control ( $r = .50, p >$

.001).<sup>1</sup> Parental responsiveness was not related to sex, age or ethnicity (all  $p$ 's > .05). Parental psychological control was not related to sex or age (all  $p$ 's > .05), but was related to ethnicity,  $t(195) = -4.47$   $p < .001$ .

### **Schema Organization and Depression Symptoms**

We next examined the relation between the cognitive schema variables and depression symptoms. Consistent with hypotheses, as depression symptoms increased, less distance was evidenced among negative content that comprised the NSO ( $r = -.40$ ,  $p < .009$ ) and more distance was evidenced among the positive content that comprised the PSO ( $r = .32$ ,  $p < .001$ ). Thus, negative and positive schema organization were both significantly associated with depression symptoms in this sample of youth.

### **Specificity of Schema Organization**

We hypothesized that PSO would be associated with depression but not anxiety symptoms. Consistent with a specificity model, there was no significant relation between anxiety symptoms and PSO ( $r = .13$ ,  $p = .14$ ). However, inconsistent with this hypothesis, there was also no significant relation between anxiety symptoms and NSO ( $r = -.16$ ,  $p = .08$ ). In the current sample, both NSO and PSO were specifically associated with depression versus anxiety symptoms.

### **Model of Depression Risk: Schema Content and Organization**

Schema content and organization variables were then examined in a multivariate context to determine whether information about a child's schema organization adds explanatory power to models of depression risk beyond information about schema content. To examine this question, we regressed depression symptoms on (1) sex and ethnicity, (2) negative schema content and (3) NSO and PSO in a hierarchical analysis.



The results of the analysis are shown in Table 2. Demographic variables of sex and ethnicity (Block 1) were not significantly correlated with depression symptoms,  $R^2 = .02$ ,  $F(2, 153) = 1.89$ ,  $p = .16$ . Negative schema content was a significant predictor in Block 2,  $\Delta R^2 = .24$ ,  $F(1, 152) = 49.25$ ,  $p < .001$ . Most interestingly, and consistent with hypotheses, NSO and PSO both emerged as significant and unique predictors, explaining a statistically significant increase in the variance of depression symptoms in Block 3,  $\Delta R^2 = .12$ ,  $F(2, 150) = 14.50$ ,  $p < .001$ . Of note, the entire model explained 38% of the variance in depression symptoms.

### **Cognitive Organization and Perceptions of Parenting**

To examine potential developmental associates of cognitive organization, we examined the relations between child-reported parental responsiveness, parental control, their interaction, and both PSO and NSO. Table 3 displays Pearson correlations for all relations among parenting variables and organization variables for the total sample. To examine the hypothesis that parenting variables would be predictive of youth cognitive organization, we conducted two simultaneous regressions, regressing first, PSO and next, NSO on ethnicity, sex, parental responsiveness, parental psychological control and the responsiveness/control interaction term. Regression coefficients are presented in Table 4. Consistent with hypotheses, the model predicting PSO was significant,  $R^2 = .06$ ,  $F(5, 191) = 2.37$ ,  $p = .04$ . Yet, no single variable emerged as a significant unique predictor. Consistent with expectations, child reported parenting variables also explained significant variance in NSO,  $R^2 = .14$ ,  $F(5, 153) = 4.36$ ,  $p < .001$ . Percentage of variance explained was of greater magnitude for NSO versus PSO. Of note, in this multivariate context, parental responsiveness was the only unique predictor of NSO.

## Discussion

This was the first study to examine the relation between cognitive organization and mood in early adolescence. Consistent with hypotheses, more tightly-interconnected negative schema organization *or* more loosely-interconnected positive schema organization were associated with higher depression symptoms. Our findings suggest that by early adolescence, a depressotypic cognitive organization is quite evident, even in a community sample of youth not selected for psychopathology, most of whom, as epidemiological data reveal, have not experienced an episode of MDD (Kessler et al., 2001). Although researchers have sometimes questioned the appropriateness of adult models of depression risk for youth, this study joins a considerable body of work highlighting the developmental consistency and potency of cognitive risk variables for mood psychopathology.

Research suggests that one of the earliest cognitive vulnerability markers on trajectories towards depression may be the lack of positive schema consolidation (McClain & Abramson, 1995; Whitman & Leitenberg, 1990), which was evident in the current study. Yet, our results mirror the findings of adult work, suggesting that how both positive *and* negative schemas are organized in the mind of early adolescents is associated with depression symptoms. Network models of schema activation (e.g., Bower, 1981; Collins & Loftus, 1975) suggest that the organization of both negative and positive schema content may have implications for depression onset, phenomenology and maintenance. When youth possess tightly-interconnected negative schemas, the activation of one negative schema content by a salient life event (e.g., rejection by peer) may easily activate other negative content about the self. A tightly-interconnected

negative network might increase the odds that negative schema content and ‘sad’ mood modes will mutually activate each other (Beck, 1996), ultimately increasing the severity and duration of dysphoria. Similarly, youth with less organized positive schema structures may not be as responsive to positive environmental input (i.e., if positive schema content does become easily activated, other related positive content and associated ‘happy’ mood modes will not be so readily activated).

Also consistent with hypotheses, specificity for cognitive organization emerged with PSO significantly associated with depression but not anxiety symptoms. Adult research yields a similar finding with PSO significantly associated with depression only (e.g., Dozois & Dobson 2001b). However, contrary to hypotheses, NSO also emerged as a specific predictor of depression symptoms in our sample. Adult research typically shows that tightly-interconnected NSO is not necessarily specific to depression with evidence of its association with anxiety and other forms of psychopathology (e.g., Dozois & Dobson, 2001b). Explanations for the lack of relation between NSO and anxiety in the current study include the possibility that NSO only begins to relate to anxiety symptoms in late adolescence or adulthood due to developmental changes (e.g., schema consolidation) or rise of particular patterns of anxiety symptoms or diagnoses (e.g., social anxiety disorder; Dozois & Frewen, 2006), or that the child-friendly items used to capture NSO here are tapping a slightly different construct than the negative items used in adult research, or finally, that the somewhat low internal consistency of the anxiety measure used here may have affected power to detect a relationship that does exist. Whatever the case, in this study, positive and negative schema organization emerged as potent and specific predictors of depression symptoms.

The current study was also the first to empirically examine the additive power of cognitive organization for predicting depression symptoms beyond negative schema content. This approach represents a rather stringent test of the unique potency of cognitive organization as a predictor of depression given the strong and well-established relation between negative schema content and depression (Abela & Hankin, 2008). Yet, consistent with a model of schemas as comprised of both structure and content (Clark, Beck, & Alford, 1999; Dozois & Beck, 2008; Ingram et al., 1998), these data suggest that schema organization is able to predict something unique about depression symptom severity, beyond what might be learned from knowledge of schema content alone.

A further objective of this investigation was to explore potential developmental associates of a depressotypic cognitive organization. Consistent with hypotheses, perceived parenting behaviours did explain significant variance in NSO and PSO. Comparatively, perceived parenting behaviours appeared to play a less significant role in PSO, explaining considerably less variance in this construct. Also, neither parental responsiveness, psychological control, nor their interaction, emerged as significant predictors of PSO in a multivariate context. By contrast, parental responsiveness emerged as a significant unique predictor of NSO, suggesting that youth who report higher levels of parenting behaviours, such as giving the child care and attention or cheering the child up when he or she is sad, also evidence less tightly-interconnected NSO. This finding is consistent with theory suggesting that parenting behaviours may be internalized by the child helping to shape not only the content, but also the organization of the core beliefs the child forms about self and key relationships with others (Young et al., 2003). Given the cross-sectional design of this research, these findings might also suggest that a

depressotypic cognitive organization influences the perception of parenting behaviours and longitudinal research is required to more carefully examine this pattern. The results obtained here also contribute significantly to a growing body of work highlighting important developmental precursors to the cognitive vulnerability to depression (Hankin et al., 2009).

Several limitations of the current investigation require note. First, although not without important strengths, employing a volunteer community sample for this investigation necessarily limits the generalizability of these findings to the wider adolescent population who may have different characteristics (e.g., different parenting experiences) than the youth whose parents gave consent for their child to participate. Our sample may also differ from clinically referred youth who, as a group, are likely to experience more severe levels of mood or psychopathology and possess more ‘depressotypic’ cognitive risk factors than evidenced here. Although the pattern of the association between cognitive organization variables and depression symptoms in this study largely mirrors the patterns evidenced in other research with clinically depressed samples of adults or late adolescents, future research will be needed to extend this model to youth with past or current MDD.

Second, our investigation is limited by the explicit self-report methodology employed. Of note, early adolescents tend to possess reduced verbal and nonverbal reasoning abilities compared to adults and are sometimes considered to have a limited understanding of internal states and beliefs (Myers & Winters, 2002; Kazdin & Petti, 1982; Zeman, Klimes-Dougan, Cassano & Adrian, 2007). Thus, when assessing child and adolescent risk for depression, relying on direct, self-report measures of cognitive content

(i.e., Children's Schema Questionnaire) and depression symptoms (i.e., Children's Depression Inventory) has limitations. In response to these limitations, researchers have pressed the importance of the development of indirect measures of cognitive schemas (e.g., Segal, et al., 1995). In this light, one advantage of the PDST is that, although self-report plays a crucial role, the final variables of interest (i.e., organization of positive and negative schema contents) are indirectly captured (i.e., participants do not report on how well organized their positive and negative schemas are).

Although the patterns of relation between cognitive organization and depression symptoms mirror previous adult and late adolescent research, it is important to note that 40 participants or 20% of the sample rated only one or even no negative adjective as self-descriptive, precluding the ability to compute a negative schema organization score for these participants. These youth were excluded from our multivariate model of risk that included both NSO and PSO, which may have affected the pattern of results obtained. It may be the case that a significant portion of youth in our study (though not the majority) had difficulty viewing any negative constructs as self-relevant. This explanation is consistent with the idea that it is lack of positive schema strength that provides the first developmental vulnerability to depression rather than the classic 'depressotypic' negative bias highlighted by cognitive models of risk (McClain & Abramson, 1995).

Implicit to the model examined here is a temporal premise, such that parenting variables lay important groundwork for cognitive schema content and organization which then provide risk for the future development of psychopathology. Although it is important to examine cross-sectional patterns of relations prior to the engagement in longitudinal work, the current data cannot be used to imply a temporal model. Indeed, other models

(e.g., depression symptoms lead to cognitive schemas which then influence the perception of parenting behaviours) are also viable and, as other depression researchers have highlighted, the relations among risk variables for depression are likely transactional and complex (Abela & Hankin, 2008).

This study was the first to jointly examine cognitive schema content and organization in a sample of community youth making the transition to adolescence, an important time for depression onset. Results support the viability of a complex schema model in which both content and structure significantly predict variability in depression symptoms. Indeed, information about participants' schema organization improved the ability to predict depression symptoms beyond that of schema content alone. From an applied perspective, if replicated with a clinical sample, relatively more indirect schema tasks such as the PDST (versus traditional self-report inventories) may provide useful additional information for identifying depression risk in preventative efforts with youth.

Notes

1. Note that partial correlations controlling for sex and ethnicity yielded little to no impact on the magnitude of the relations between depression symptoms and parenting (all  $r$ 's  $> +/- .48$ ).



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Table 1

*Descriptive Characteristics of the Sample*

Characteristic	Total ( <i>n</i> = 198) <sup>1</sup>		Boys ( <i>n</i> = 95)		Girls ( <i>n</i> = 103)		Caucasian ( <i>n</i> = 158)		Diverse Ethnicity ( <i>n</i> = 40)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
CDI score	7.73	6.56	7.54	6.78	7.15	6.38	*6.87	5.84	*9.38	8.74
MASC score	12.16	5.25	*10.97	5.01	*13.14	5.27	12.18	5.29	12.06	5.20
CSQ Content	37.12	8.86	37.53	9.57	36.72	8.17	*36.25	8.21	*40.76	10.57
PDST NSO	1.37	.45	1.30	.49	1.39	.40	1.37	.44	1.37	.48
PDST PSO	.38	.20	.36	.22	.41	.20	.39	.20	.36	.21
MR	4.38	.74	4.40	.73	4.36	.76	*4.43	.66	*4.16	1.00
PR	4.02	.89	4.01	.94	4.04	.85	4.05	.91	3.87	.81
MPC	1.84	.77	1.88	.80	1.80	.74	*1.72	.63	*2.32	1.05
PPC	1.91	.69	*2.03	.75	*1.60	.61	*1.83	.64	*2.24	.79

Note: CDI = Children's Depression Inventory, MASC = Multidimensional Anxiety Scale for Children (10 item version), CSQ = Children's Schema Questionnaire, PDST NSO = Psychological Distance Scaling Task Negative Schema Organization, PDST PSO = Psychological Distance Scaling Task Positive Schema Organization, MR = maternal responsiveness, PR = paternal responsiveness, MPC = maternal psychological control, PPC = paternal psychological control. \*denotes significance differences for sex or ethnicity analyses at the  $p < .05$  level, two-tailed. Sample size varies from 198 for MASC ( $n = 141$ ) and CSQ ( $n = 193$ ) scores which were not collected from all participants.

Table 2

*Hierarchical Regression Analysis Summary for Cognitive Content and Organization**Variables Predicting Depression Score*

	<b>Variable</b>	<i>B</i>	<i>SEB</i>	$\beta$	<i>t</i>	<i>p</i>
Block 1:	Ethnicity	2.57	1.37	.15	1.88	.06
	Sex	.31	1.11	.02	.28	.77
Block 2:	Negative Schema Content	.39	.05	.50**	7.02	<.001
Block 3:	Negative Schema Organization	-3.89	1.04	-.25**	-3.75	<.001
	Positive Schema Organization	6.87	2.18	.21*	3.15	.002

Note: \* =  $p < .05$  and \*\* =  $p < .001$

Table 3

*Pearson Correlations for Cognitive Content, Organization and Parenting Variables*

	1.	2.	3.	4.	5.
1. <i>Negative Schema Content</i>	--	.18*	-.24**	-.18*	.43**
2. <i>PSO</i>		--	-.18*	-.15*	.12
3. <i>NSO</i>			--	.35**	-.26**
4. <i>Responsiveness</i>				--	-.53**
5. <i>Psychological Control</i>					--

Note: NSO = Negative Schema Organization, PSO = Positive Schema Organization,  
 \* =  $p < .05$  and \*\* =  $p < .001$

Table 4

*Regression Analysis Summary for Parenting Variables Predicting Cognitive Organization*

Variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>t</i>	<i>p</i>
<b>1. PSO Model</b>					
Ethnicity	-.05	.04	-.10	-1.33	.19
Sex	-.05	.03	-.12	-1.73	.09
Parental Responsiveness	.02	.01	.13	1.47	.14
Parental Psychological Control	-.02	.01	-.12	-1.43	.15
PR X PPC	.004	.007	.04	.47	.64
<b>2. NSO Model</b>					
Ethnicity	.09	.09	.08	1.03	.31
Sex	-.06	.07	-.07	-.92	.36
Parental Responsiveness	.09	.03	.29*	3.37	.001
Parental Psychological Control	-.05	.03	-.14	-1.48	.14
PR X PPC	-.01	.02	-.06	-.72	.47

Note: PR = Parental Responsiveness and PPC = Parental Psychological Control

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