

Control-Related Beliefs and Depressive Symptoms in Clinic-Referred Children and Adolescents: Developmental Differences and Model Specificity

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The contingency–competence–control (CCC) model links contingency and competence beliefs to perceived control and, in turn, to depression. However, a developmental perspective suggests that noncontingency may be too abstract a concept to be directly tied to depression before adolescence. We tested the CCC model and this developmental notion, using structural equation modeling, with 360 clinic-referred 8- to 17-year-olds. The CCC model fit the data well for the full sample accounting for 46% of the variance in depression. Separate analyses by age group placed perceived contingency in the best-fit model for adolescents (ages 12–17 years) but not for children (8–11 years). This suggests that abstract cause–effect concepts may have more direct affective impact after the cognitive changes of adolescence (e.g., formal operations) than before. Finally, the CCC model accounted for much more variance in depression than conduct problems, suggesting diagnostic specificity.

Is depression associated with low levels of perceived control? The answer to this question may have significant implications for our understanding of the cause and core features of depression and for efforts to develop effective prevention and treatment programs. Control-related beliefs do not enter into current diagnostic criteria for depressive disorders (see American Psychiatric Association, 1987, 1994). However, some major theories in the field do link depression to a perceived lack of control over significant outcomes (see, e.g., Abramson, Seligman, & Teasdale, 1978; Alloy, Lipman, & Abramson, 1992; Beck, Rush, & Emery, 1979). Research with adults has supported at least some forms of this association (see, e.g., Peterson & Seligman, 1984; Sweeney, Anderson, & Bailey, 1986). However, the evidence for children¹ is less clear (see Hammen, 1991; Hammen & Rudolph, 1996; Hillsman & Garber, 1995).

The child research shows some intriguing relationships between depressive symptoms and measures that appear at least conceptually related to perceived control. For example, child depression symptoms have been found to be associated with self-blame for

negative events (Moyal, 1977); negative self-perceptions and low self-esteem (Haley, Fine, Marriage, Moretti, & Freeman, 1985; Kaslow, Rehm, & Siegel, 1984; Robinson, Garber, & Hillsman, 1995); negative views of self, the world, and the future (i.e., the cognitive triad) on a cognitive triad inventory (Stark, Printz, Livingston, & Tsai, 1992; Stark, Schmidt, & Joiner, 1996); external locus of control (McCauley, Mitchell, Burke, & Moss, 1988); negative outlook (Gotlib, Lewinsohn, Seeley, Rohde, & Redner, 1993); low perceived competence (e.g., Cole, Peeke, Dolezal, Murray, & Canzoniero, 1999); and perceived helplessness regarding the future (Kazdin, Esveltd-Dawson, Sherick, & Colbus, 1985). Moreover, a meta-analytic review found that children's depressive symptoms were reliably related to an attributional style involving internal, stable, and global attributions for negative outcomes and external, unstable, and specific attributions for positive outcomes (Gladstone & Kaslow, 1995).

Each of these findings contributes significantly to our understanding of the cognitions associated with child depression, and each suggests, at least indirectly, the possibility of a linkage between depression and perceived control. However, perhaps the most direct theoretically derived tests of an association between child depressive symptoms and specific control-related beliefs have come from a series of studies growing out of the *contingency–competence–control* (CCC) model (Weisz, 1986; Weisz & Stipek, 1982). This model reflects a synthesis of developmental research on control beliefs (summarized in Weisz, 1986, 1990) and concepts from the locus of control and self-efficacy traditions (e.g., Bandura, 1977; Crandall, 1971; Rotter, 1966).

Within the CCC model, *control* is defined as the capacity to produce an intended outcome (e.g., getting a desired grade, making a friend). Control, thus defined, is logically linked to two addi-

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¹ Throughout this article, we use the term *children* to refer to both children and adolescents collectively, except when a distinction needs to be drawn between the two age groups.

tional factors: outcome contingency and personal competence. The *contingency* of an outcome is defined as the degree to which that outcome depends on the behavior of relevant individuals: in the case of a child, "kids" in general. The individual's *competence* with respect to that outcome is defined as his or her level of ability to produce the behavior on which the desired outcome is contingent. So, perceived control is expected to be significantly related to perceived outcome contingency and perceived personal competence. For example, a child's judgment as to how much she can control her grades in school may be influenced both by how contingent (or "fair") she believes her teacher is in assigning grades and how competent she believes she is to perform the behaviors on which her teacher's grade assignments are based.

Two distinctions may help clarify how the CCC model differs from other perspectives. First, the model distinguishes between control and obtaining a desired outcome; the latter does not necessarily involve personal causal agency because desired outcomes may occur by chance or through the actions of others. The model also distinguishes between control and personal causality (or personal responsibility); the latter may not involve achieving desired outcomes because one may also exercise personal agency in causing unwanted outcomes. Thus, the CCC model requires causal agency in the production of intended outcomes.²

Perceived contingency and competence are expected to predict significantly, but not fully account for, perceived control, because control judgments may be influenced by various additional factors, some of which are transitory or based on recent events (e.g., confidence borne of a recent success, a belief that a generally fair teacher "is mad at me today"). Thus, prediction of phenomena thought to be related to low levels of control-related beliefs can be strengthened in some cases if measures of perceived contingency and perceived competence are complemented by a measure of perceived control to capture variance not accounted for by perceived contingency and competence alone.

The CCC model is particularly relevant to the subjective experience of depression and, in turn, to preventive and therapeutic intervention for depression. For example, the theoretical model (see Weisz, 1990; Weisz, Sweeney, Proffitt, & Carr, 1993) links low levels of perceived contingency to depressive cognitions about the nature of the world (e.g., "life is unfair," "people do not get what they deserve") and low levels of perceived competence to depressive thoughts involving self-blame and low self-esteem (e.g., "I screwed up," "I'm no good at this"). Different beliefs within the CCC system would clearly have different implications for intervention. To the extent that depression involves a perception that one is low in competence, interventions could emphasize skill building (if the perceptions are veridical) or modifying self-perceptions and self-talk (if the perceptions are unduly self-deprecating). To the extent that depression involves a perception that important events occur noncontingently in one's environment, interventions could focus on altering the environment (if the perceptions are accurate) or modifying the negative cognitions about the environment (if the perceptions are inaccurate).

Studies of the CCC model and child depression have thus far examined whether depressive symptoms in children are related to their beliefs about personal competence, outcome contingency, and control over outcomes. Samples have included mental health clinic outpatients (three samples, ages 8–15 years; Weisz, Weiss, Wasserman, & Rintoul, 1987), mental health inpatients (three

samples, ages 8–18 years; Weisz et al., 1989), and a nonclinical school sample (one sample, ages 8–12 years; Weisz et al., 1993). All three studies found depressive symptoms, as measured by the Children's Depression Inventory (CDI; Kovacs, 1992), to be related to measures of perceived competence and perceived control. However, findings were mixed with regard to perceived contingency; only one of the three studies found contingency beliefs to be significantly related to depressive symptoms.

The mixed findings on contingency beliefs may have a developmental explanation. Reviews of developmental research show marked age differences in the ways children and adolescents use various control-related beliefs (see Rothbaum & Weisz, 1989; Weisz, 1986, 1990). For example, whereas even preadolescents perceive that contingency and competence are related to control, the personal affective implications of noncontingency (e.g., "If outcomes are noncontingent, trying hard won't help, and this makes me feel sad") are more readily grasped by adolescents than children. The capacity to feel genuinely distressed over the hypothetical consequences of low contingency (e.g., "If good and bad things happen to people noncontingently, then the system is unfair, nothing anyone does will matter, and it's all hopeless") may require the increased potency of hypothetical reasoning associated with adolescence (Flavell, Miller, & Miller, 1993; Piaget, 1954, 1960). So both evidence and theory suggest that the relation between contingency beliefs and depressive symptoms may be stronger in adolescents than in children.

In the present study, we explored this possibility, and we addressed another major limitation of all previous studies on the CCC model. Although each previous study tested certain elements of the CCC model, none provided a comprehensive test of the full model. Such a test requires examining the association of (a) perceived contingency and competence with perceived control and (b) the control belief dimensions with depressive symptoms, ideally assessed using multiple measures (to avoid the risk of findings reflecting idiosyncracies of a particular depression measure). The present study provided precisely such a test, using structural equation modeling (SEM), with a latent factor of depression created from three different measures, including both questionnaire and interview assessments (vs. the single-questionnaire approach to depression measurement used in previous research). Clinical relevance was maximized by focusing exclusively on clinically re-

² Bandura (1977, 1986) distinguished between outcome expectations and efficacy expectations. The former is an individual's estimate that a particular behavior will lead to a desired outcome; this resembles a belief in contingency as we have defined it. Bandura's efficacy expectation is the belief that one can perform the behavior that produces the desired outcome; this resembles a belief in personal competence as we have defined it. However, Bandura's assessment procedures do not consistently differentiate contingency and competence beliefs as we construe them. For example, in one of Bandura's assessments, people are given "self-efficacy scales representing tasks varying in difficulty, complexity . . . or some other dimension" and asked "which tasks they judge they can do and their degree of certainty that they can execute them" (Bandura, 1986, p. 422). The procedure fits Bandura's purposes well but does not fit neatly within the CCC model: If people predict that they cannot succeed at a task, it would remain unclear whether they perceive success as noncontingent, themselves as low in competence, or both. The CCC model thus emphasizes separate assessment of contingency and competence beliefs.

ferred youth; and a large sample and broad age range made it possible to carry out separate tests for children and adolescents to test the developmental hypothesis that contingency beliefs would be a more potent predictor of depression in adolescents than in children.

We addressed two other questions. First, we asked whether parent reports of youth depression might be predicted by the youngsters' control-related beliefs. Extensive evidence shows low agreement between youth and parent reports of internalizing problems (see, e.g., Achenbach, McConaughy, & Howell, 1987; Herjanic & Reich, 1997). In addition, there is debate about whose report (parent or youth) is more valid for youth psychopathology (see, e.g., Bird, Gould, & Staghezza, 1992; Kazdin, French, Unis, & Esveltd-Dawson, 1983). However, an investigation with the same diagnostic interview used in the present study (Rubio-Stipec et al., 1994) found that child reports corresponded more closely than parent reports to clinician judgments of depression. Several research reviews (Hammen & Rudolph, 1996; Kazdin & Marciano, 1998; Schwartz, Gladstone, & Kaslow, 1998) have suggested that youth self-reports of depression may warrant greater credence than parent reports.³ Apart from the measurement issue, note that the CCC model was intended to apply only to youths' subjective experience of control and of depression; it may be unreasonable to expect child cognitions to be closely related to adults' reports of their children's symptoms. Thus, for several reasons, we did not anticipate that children's control-related beliefs would predict parent-reported child depression. However, for completeness, we tested the relationship, applying SEM procedures to a latent depression factor based on parent reports.

Finally, we assessed the specificity of the model to depression by examining both the pattern of associations related to depressive symptoms and the pattern of associations related to conduct disorder symptoms. Without such a specificity test, one could argue that the model applies to psychological dysfunction generally. We hypothesized that the model would predict depressive symptoms more powerfully than conduct disorder symptoms.

Method

Sample and Data Collection Procedures

This study is part of a larger project focused on children referred for treatment in seven outpatient community mental health clinics in southern and central California. For participating families (more than 80% of those who were asked), multiple clinical measures were administered on multiple occasions. This study focuses on depression and control-related belief measures obtained at the initial interview before treatment.

The sample included 360 youngsters aged 8 to 17 years ($M = 11.8$ years, $SD = 2.3$ years); 161 (45%) were children aged 8 to 11 years; 199 (55%) were adolescents aged 12 to 17 years. This sample of 228 boys (63%) and 132 girls (37%) had considerable ethnic diversity; 47% were Caucasian, 17% African American, 16% Latino/a, and 20% other or mixed ethnicity. Clinically, the sample appeared quite representative of youth referred to outpatient community clinics. Total problem T scores ($M = 50$, $SD = 10$) averaged 66.1 on the Child Behavior Checklist (Achenbach, 1991a; see later discussion) and 60.1 on the Youth Self-Report Form (YSR; Achenbach, 1991b; see later discussion), and the youth were referred for a broad variety of behavioral and emotional problems.

Measures

Primary assessment procedures for the study were three measures of control-related beliefs and three measures of self-reported depressive symptoms; for secondary analyses, we also included two parent-report depression measures.

Control beliefs I: Self-Perception Profile for Children (Pcomp). To assess children's self-perceptions of their competence, we used the Self-Perception Profile for Children (Harter, 1985), derived from the Perceived Competence Scale for Children (Harter, 1982). The measure is an excellent operational definition of perceived competence, as construed within the CCC model. Items involve structured alternatives (e.g., "Some kids often forget what they learn" but "Other kids can remember things easily"). Children first choose which alternative is more true of them and then rate how true that alternative is for them. Harter (1982) reported 3-month and 9-month test-retest reliabilities (for the Perceived Competence Scale) of .69 to .87 for third to ninth graders. In its current form, the measure has items reflecting different domains (e.g., scholastic/academic, social, behavioral); for consistency across measures of the three control belief domains in the present study, we used the academic, social, and behavioral domains, a total of 18 items. Cronbach's alpha for this measure (here abbreviated Pcomp) in the present sample was .82 ($N = 360$), and test-retest reliability (6 month) was .67 ($N = 208$).

Control beliefs II: Perceived Contingency Scale for Children (Pcontin). The Pcontin measure (Weisz, Sweeney, & Proffitt, 1991) is a 30-item scale designed to assess beliefs about the contingency of outcomes in academic, social, and behavioral domains. Half the items are worded in a positive (i.e., procontingency) direction (e.g., "Kids who work hard in school get good grades"), and half in a negative direction (e.g., "Grades do not depend on how hard kids try"). In a school sample of 8- to 12-year-olds (Weisz et al., 1993), α was found to be .86, and retest reliability over a 10-day interval was .80. Alpha for the present sample was .85 ($N = 360$), and test-retest reliability (6 month) was .69 ($N = 216$).

Control beliefs III: Perceived Control Scale for Children (Pcontrol). The Pcontrol measure (Weisz, Southam-Gerow, & Sweeney, 1998) is a 24-item scale designed to assess beliefs about one's ability to exert control over outcomes in academic, social, and behavioral domains. Half the items are worded in a procontrol direction (e.g., "I can do well on tests at school if I study hard"), and half in a negative direction (e.g., "I cannot get other kids to like me no matter how hard I try"). Alpha for this measure in the present sample was .88 ($N = 360$), and test-retest reliability (6 month) was .57 ($N = 211$).

Self-report depression I: CDI. The 27-item CDI (Kovacs, 1992) is "the most widely used and researched measure of childhood depression" (Kendall, Cantwell, & Kazdin, 1989, p. 121). The CDI shows Cronbach's α s ranging from .71 to .89 in clinical samples (see Kovacs, 1992), and test-retest reliabilities ranging from .50 to .87 in clinical samples (see Kovacs, 1992). Alpha for the present sample was .87 ($N = 360$), and test-retest reliability (6 month) was .66 ($N = 211$).

Self-report depression II: Diagnostic Interview Schedule for Children (DISC), depression module. Self-report depression symptoms counts were generated with the depression module of the National Institute of Mental Health (NIMH) Diagnostic Interview Schedule for Children, Child

³ Hammen and Rudolph (1996), for example, noted that "internal symptoms such as depressed feelings and negative thoughts, for example, cannot readily be detected by parents, and therefore the child's report might be given greater weight in a diagnosis of depression" (p. 159). Kazdin and Marciano (1998) stated, "Self-report is particularly important in assessing depression, because key symptoms such as sadness, feelings of worthlessness, and loss of interest in activities reflect subjective feelings and self-perceptions. Also, children are often considered to be better sources of information regarding internalizing symptoms than are parents" (p. 222).

Table 1
Pearson Correlations Between Control Belief Measures and Depression Measures

Variable	1	2	3	4	5	6	7	8
1. Pcomp	—	.250***	.467***	-.598***	-.444***	-.371***	-.064	-.014
2. Pcontin		—	.552***	-.367***	-.237***	-.259***	-.049	-.071
3. Pcontrol			—	-.527***	-.363***	-.295***	-.175**	-.139*
4. CDI				—	.629***	.605***	.163*	.218***
5. YSR-AD					—	.527***	.168**	.125
6. DISC-C						—	.120	.142*
7. CBCL-AD							—	.583***
8. DISC-P								—

Note. YSR-AD = Youth Self-Report Form Anxious-Depressed scale score; CBCL-AD = Child Behavior Checklist Anxious-Depressed scale score; Pcomp = Self-Perception Profile for Children; Pcontin = Perceived Contingency Scale for Children; Pcontrol = Perceived Control Scale for Children; CDI = Children's Depression Inventory; DISC-C = Diagnostic Interview Schedule for Children, Child Form; DISC-P = Diagnostic Interview Schedule for Children, Parent Form.

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

Form (DISC-C; Shaffer, Fisher, Piacentini, Schwab-Stone, & Wicks, 1991), a highly structured interview geared to the diagnostic categories of the *Diagnostic and Statistical Manual of Mental Disorders* (third edition, revised [DSM-III-R]; American Psychiatric Association, 1987). Test-retest reliability for depression symptoms on DISC-C has been reported at .82, with α of .85 (Schwab-Stone et al., 1993). Test-retest reliability (6 month) in the present sample was .55 ($N = 215$).

Self-report depression III: YSR, anxious-depressed syndrome score. An additional measure of depressive symptoms was the anxious-depressed syndrome T score of the YSR (Achenbach, 1991b). The YSR lists 118 problems that the youth rates on a 3-point scale (0 = *not true*, 1 = *somewhat true*, 2 = *very true or often true*).⁴ In principal-components analyses reported by Achenbach (1991b), 16 YSR problem items formed a factor labeled "anxious-depressed." Most of the 16 items appear to be depressive in nature (e.g., "I am unhappy, sad, or depressed," "I cry a lot," "I think about killing myself," "I deliberately try to hurt or kill myself"); only a few appear to involve primarily anxiety (e.g., "I am nervous or tense"). Scores on this 16-item composite were correlated .63 with CDI scores and .53 with DISC-C depression scores in our sample. Achenbach (1991b) reported test-retest reliability of the YSR anxious-depressed scale score at $r = .81$ over a 1-week interval and $r = .60$ over a 7-month interval. Cronbach's α for this measure in the present sample was .86 ($N = 355$), and test-retest reliability (6 month) was .54 ($N = 220$).

Self-report conduct disorder I: DISC-C, conduct disorder module. Self-report conduct disorder symptom counts were generated using the conduct disorder module of the DISC-C (Shaffer et al., 1991), described previously. Test-retest reliability for conduct disorder symptoms has been reported at .68 and α at .85 (Schwab-Stone et al., 1993). Test-retest reliability (6 month) in the present sample was .73 ($N = 217$).

Self-report conduct disorder II: YSR, aggressive behavior and delinquent behavior syndrome scores. In principal-components analyses of the YSR (Achenbach, 1991b), these were the only two narrow-band factors loading on the broad-band externalizing factor. Achenbach (1991b) reported 1-week test-retest reliabilities at $r = .79$ for the aggressive scale and .72 for the delinquent scale, with $r = .48$ for both scales over a 7-month lag. In the present sample, Cronbach's α for the aggressive scale was .85 ($N = 353$), and test-retest reliability (6 month) of .62 ($N = 220$); Cronbach's α for the delinquent scale was .74 ($N = 358$), and test-retest reliability (6 month) was .66 ($N = 220$).

Parent-report depression I: DISC, Parent Form, depression module. Depression symptoms counts were also generated using the depression module of the parent-report DISC (DISC-P; Shaffer et al., 1991; see prior discussion). Test-retest reliability for depression symptoms on DISC-P has

been reported at .82, with α of .88 (Schwab-Stone et al., 1993). Test-retest reliability (6 month) in the present sample was .68 ($N = 222$).

Parent-report depression II: CBCL, anxious-depressed syndrome score. We also used the CBCL anxious-depressed syndrome T score (Achenbach, 1991a). As with the YSR (see prior discussion), most of the 14 items on this factor appear to be depressive in nature. Achenbach (1991a) reported test-retest reliability for the scale at $r = .86$ over a 1-week interval, and $r = .73$ over a 1-year interval. Cronbach's α for this measure in the present sample was .80 ($N = 327$), with test-retest reliability (6 month) of .63 ($N = 254$). Table 1 shows correlations among the parent-report and youth-report depression measures and the youth control belief measures.

Age Group Comparison on Psychometrics and Psychopathology

Given our plan for separate model tests with children (8–11 years) and adolescents (12–17 years), we sought to understand whether the study measures were similarly reliable (alpha and test-retest) in the two age groups and to test for age groups differences in patterns of psychopathology. The two groups showed similar alphas on the various measures: Pcomp (.80 and .85 for children and adolescents, respectively), Pcontin (.82 and .86), Pcontrol (.88 and .88), CDI (.85 and .89), YSR Anxious-Depressed (.86 and .87), YSR Aggressive (.85 and .85), and YSR Delinquent (.64 and .77). Test-retest figures were also similar for the two age groups: Pcomp (.68 and .66), Pcontin (.67 and .70), Pcontrol (.46 and .71), CDI (.68 and .63), YSR Anxious-Depressed (.53 and .54), YSR Aggressive (.54 and .69), and YSR Delinquent (.49 and .69).

Next, we focused on relevant psychopathology comparisons. We compared children and adolescents on 26 symptom and diagnosis measures: (a) YSR Total Problems and all eight YSR narrow-band scales (i.e., Withdrawn, Somatic, Anxious-Depressed, Social Problems, Thought Problems, Attention Problems, Aggressive Behavior, and Delinquent Behavior); (b) CBCL total problems and all eight CBCL narrow-band scales (same as for YSR); (c) DISC-C symptom counts for depressive disorders and for conduct disorder; (d) DISC-P symptom counts for depressive disorders and for conduct disorders; and (e) DISC-C diagnosis of any depressive disorder

⁴ Technically, the YSR is intended for use with children aged 11 to 18 years. We included it in this study with younger children as well because we found the psychometric characteristics of the measure to be similar for 8- to 10-year-olds and older youth in the present sample (see Yeh, 1996).

or conduct disorder; and (f) DISC-P diagnosis of any depressive disorder or of conduct disorder. Child and adolescent groups were compared using *t* tests and chi-square tests, as appropriate. Given the large number of tests and the large samples involved, we applied a Bonferroni correction to reduce the risk of chance findings.

As expected, based on extensive epidemiological evidence (e.g., Costello, 1989; Verhulst & Koot, 1992), there were some mean differences between the younger and older groups on psychopathology measures. Children, compared with adolescents, had significantly higher scores on YSR Somatic Problems ($p < .001$) and YSR Social Problems ($p < .001$). Adolescents, compared with children, had higher scores on YSR Delinquent Behavior ($p < .001$) and on DISC-C conduct disorder symptom counts ($p < .001$) and were, not surprisingly, more likely to qualify for a conduct disorder diagnosis ($p < .001$). The two age groups did not differ reliably on the other 21 psychopathology measures.

The alpha and test-retest findings suggest that the measures all have psychometric integrity for children and adolescents, considered separately, so that it is appropriate to conduct analyses within the two age groups independently. The second group of findings, involving group comparisons on psychopathology measures, showed that, although the groups did not differ reliably on most psychopathology dimensions, there were some significant differences, supporting the need to assess model fit separately for children and adolescents.

Results

Overview of Data Analyses

Our primary goal was to test how well the CCC model explained the subjective experience of youth depression. The overall model suggests that perceived contingency and perceived competence will predict perceived control, and that these component beliefs will, in turn, be related to youth-reported depression. Preliminarily, we conducted a series of regression analyses to test whether gender should be incorporated into the CCC model. Next, the CCC model for youth depression was tested for the full sample. Then, to examine the impact of age, we tested the CCC model for youth-reported depression separately for children and adolescents. We expected that contingency beliefs would be more closely related to depression in adolescents than in children. Next, for completeness, we tested the model for parent-reported depression; because the CCC model is intended to apply to youths' subjective experience of perceived control and of depression, we expected a good fit for self-reported depression but not for parent-reported child depression. Finally, we tested the CCC model as applied to conduct disorder to explore the specificity of the model (i.e., whether it applies to depression in particular or psychopathology more generally).

For model testing we conducted SEM using the maximum-likelihood estimation technique. To provide a diversified picture of the goodness of fit of the data to the model, we used three fit indexes: comparative fit index (CFI; Bentler, 1990), incremental fit index (IFI; Bollen, 1990), and root mean square error of approximation (RMSEA; Steiger, 1990). The most important of these was the CFI, which is used as an indicator of overall fit. CFI ranges from 0 to 1 and is derived from comparison of the hypothesized model with the independence model; acceptable fit is indicated by values greater than .90 according to some authors (e.g., Byrne, 1995) and .95 according to others (e.g., Hu & Bentler, 1999). Because its values are relatively unaffected by sample size

(Gerbing & Anderson, 1993), the CFI is increasingly accepted as a key index of model fit (Chorpita, Albano, & Barlow, 1998). We also included the IFI, which controls for degrees of freedom available to evaluate the target model, penalizing for estimation of many paths; IFI values generally range from 0 to 1 and are evaluated in the same way as CFI values. We also used the RMSEA, which is interpreted using conventional significance tests, with $p < .05$ representing close fit and values in the range of .05 to .08 indicating fair fit (Browne & Cudek, 1993). Although RMSEA is sensitive to sample size, it has the advantage that, like IFI, it rewards parsimony in path specification (Jaccard & Wan, 1996).

In addition to these indexes of model fit, we include the Satorra-Bentler scaled chi-square statistic (SBSS), because an examination of Mardia's coefficient suggested significant nonnormality (Chou, Bentler, & Satorra, 1991; Hu & Bentler, 1999). The SBSS is expressed as a chi-square value and is subjected to significance testing; $p > .05$ is considered to represent acceptable fit. Despite this heuristic, chi-square tests have been criticized for their sensitivity to sample size; with a large sample, even minor deviations from perfect fit can produce quite significant chi-square values (Hu & Bentler, 1995). Given our relatively large sample, we did not stress the SBSS in reaching conclusions about model fit, but we do report these chi-square values for readers seeking comprehensive information.

For each model, we began by testing the basic CCC model and then used the result to make modifications and identify a best fitting model. To create a best fitting model, we removed nonsignificant paths from the original model, one at a time. Then, we used the Lagrange multiplier test (Bentler, 1995) to determine whether to add a correlated error term between the latent factor indicators. No other paths were added to the original models. Models were compared using a standard chi-square difference test, whereby nested models were compared systematically.

Assessing the Impact of Gender

As a preliminary step, we assessed whether gender might moderate the relation between control-related beliefs and depression. Hierarchical regression analyses were used to predict depression, with gender, control-related beliefs, and their interaction as predictors. Analyses were done separately for children and for adolescents; separate regression equations were used for each of the three depression measures, and Bonferroni correction was applied to each set of analyses ($.05/3 = .016$). The interaction term was not significant in any of the six regressions, indicating that gender did not moderate the relation between control-related beliefs and youth depression. So we combined boys and girls in all subsequent analyses.

Testing Relationships Predicted by the CCC Model of Depression

As noted early in this article, the CCC model of depression posits that (a) both perceived contingency and perceived competence will be significantly associated with perceived control, and (b) depression will be predicted by perceived contingency and perceived competence, with additional variance in depression

sometimes accounted for by perceived control (because perceived control is not fully accounted for by perceived contingency and competence). The full model thus included paths from Pcontin and Pcomp to Pcontrol as well as paths from Pcontin, Pcomp, and Pcontrol to youth depression. In our tests of the model, the latent variable youth depression represented the youngsters' self-reported depressive symptoms as measured by YSR Anxious-Depressed, total CDI score, and DISC-C Depression module symptom count.

In our initial test of the full model, all path coefficients were significant, except for the association between Pcontrol and depression, and the model fit was acceptable, CFI = .952, IFI = .953, RMSEA = .091, SBSS $\chi^2(7, N = 360) = 28.77, p < .001$. As the CCC model predicts, both Pcontin and Pcomp were significantly related to Pcontrol; 34% of the variance in Pcontrol was accounted for by these two components. Also as predicted, both Pcontin and Pcomp were significantly related to depression; the control-related belief measures accounted for 36% of the variance in depression.

Next, we proceeded to identify the best fitting model by dropping the nonsignificant path between Pcontrol and depression and adding a correlational path between the error terms for DISC-C and YSR. Fit indexes for the resulting best fit model for the full sample were CFI of .961, IFI of .962, and RMSEA of .082, SBSS $\chi^2(7, N = 360) = 24.62, p < .001$. In this model, shown in Figure 1, Pcontrol was predicted by Pcomp and Pcontin ($R^2 =$

.338), both of which predicted depression, accounting for 46% of the variance in depression.

Separate Models for Children and Adolescents

The CCC model was also tested separately for children (aged 8–11 years) and adolescents (aged 12–17 years). Results, shown in Figure 2, supported the CCC model but suggested age-related differences like those discussed early in this article. Both Pcontin and Pcomp significantly predicted Pcontrol for both study age groups, as predicted by the CCC model. In addition, the CCC model fit was acceptable for both children (CFI = .977, IFI = .978, RMSEA = .069), $\chi^2(7, N = 161) = 12.257, p = .092$, and adolescents (CFI = .949, IFI = .950, RMSEA = .106), $\chi^2(7, N = 199) = 22.586, p = .002$. However, as shown in Figure 2, the age groups diverged in an interesting way with regard to prediction of depression. Among adolescents, paths from Pcontin and Pcomp to depression were both significant; among children, the path from Pcomp was significant, but the path from Pcontin was not. The path from Pcontrol to depression was significant for children but not for adolescents.

To explicate the age group differences further, we identified the best fitting models for children and adolescents, respectively. First, for children, we dropped the nonsignificant path between Pcontin and depression from the model. Because the Lagrange multiplier test was nonsignificant, we did not add any correlational paths.

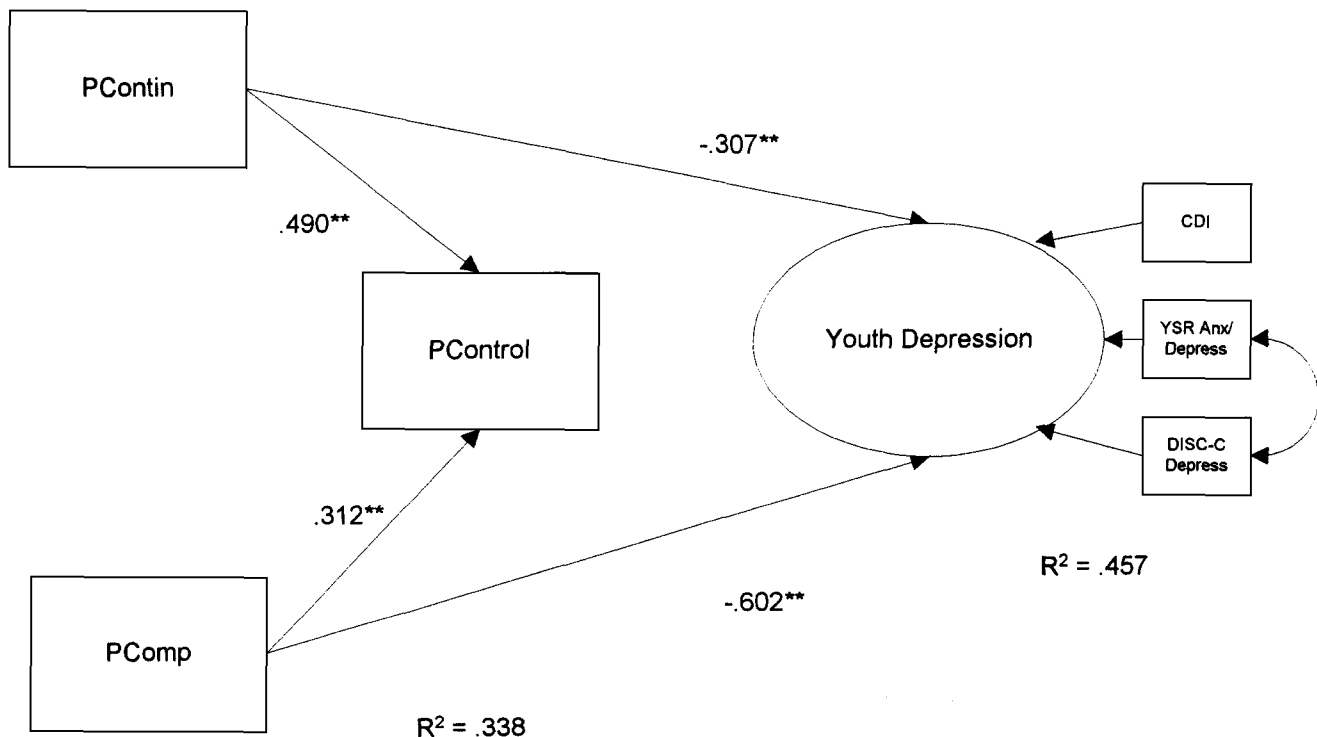


Figure 1. Contingency-competence-control model for youth-reported depression; best fitting model applied to the full sample. PContin = Perceived Contingency Scale for Children; PControl = Perceived Control Scale for Children; PComp = Self-Perception Profile for Children; CDI = Children's Depression Inventory; YSR = Youth Self-Report; DISC-C = Diagnostic Interview Schedule for Children, Child Form. Anx/Depress = Anxiety/Depression. ** $p < .01$.

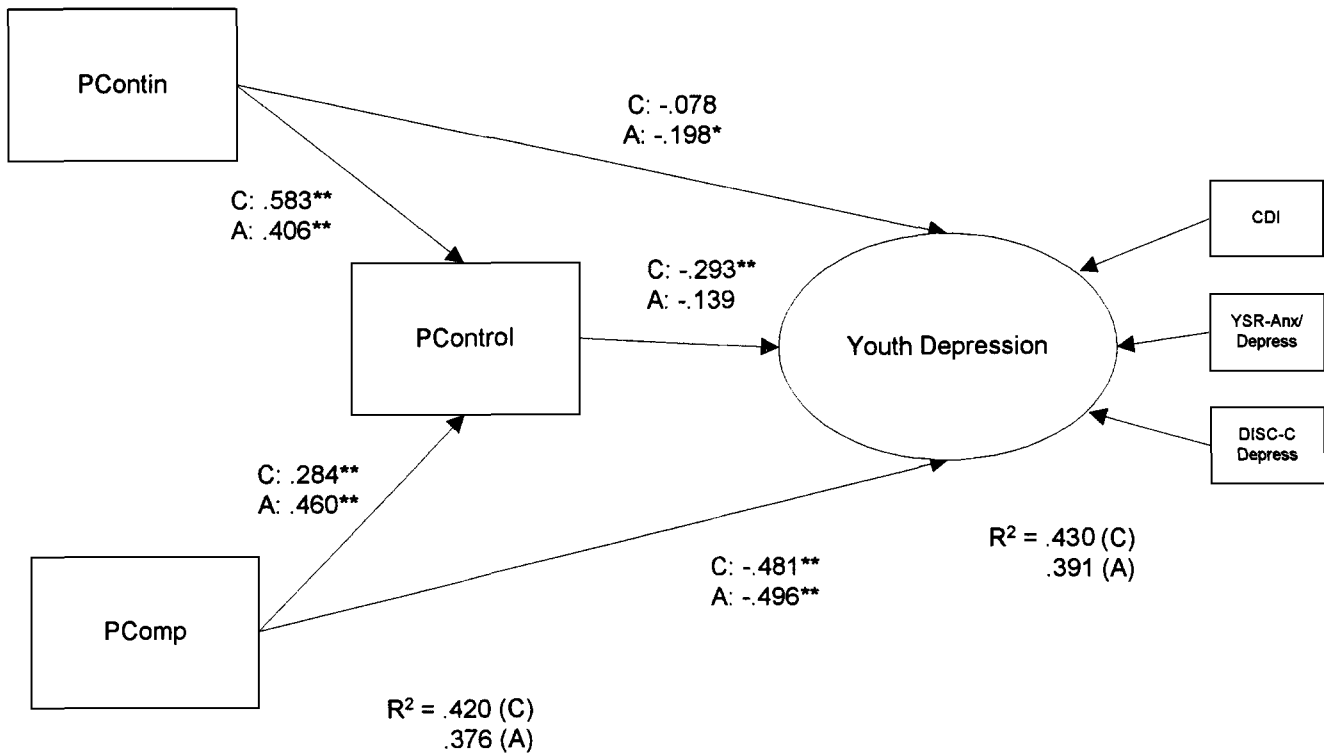


Figure 2. Contingency-competence-control model for youth-reported depression, applied separately to children (C) and adolescents (A). PContin = Perceived Contingency Scale for Children; PControl = Perceived Control Scale for Children; PComp = Self-Perception Profile for Children; CDI = Children's Depression Inventory; YSR = Youth Self-Report; DISC-C = Diagnostic Interview Schedule for Children, Child Form. Anx/Depress = Anxiety/Depression. * $p < .05$. ** $p < .01$.

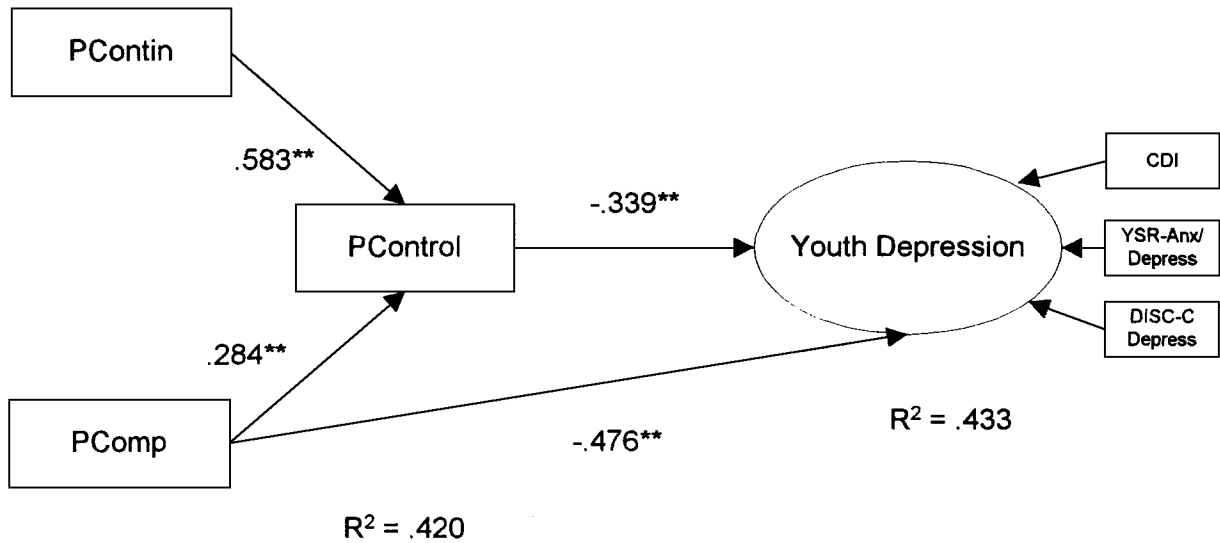
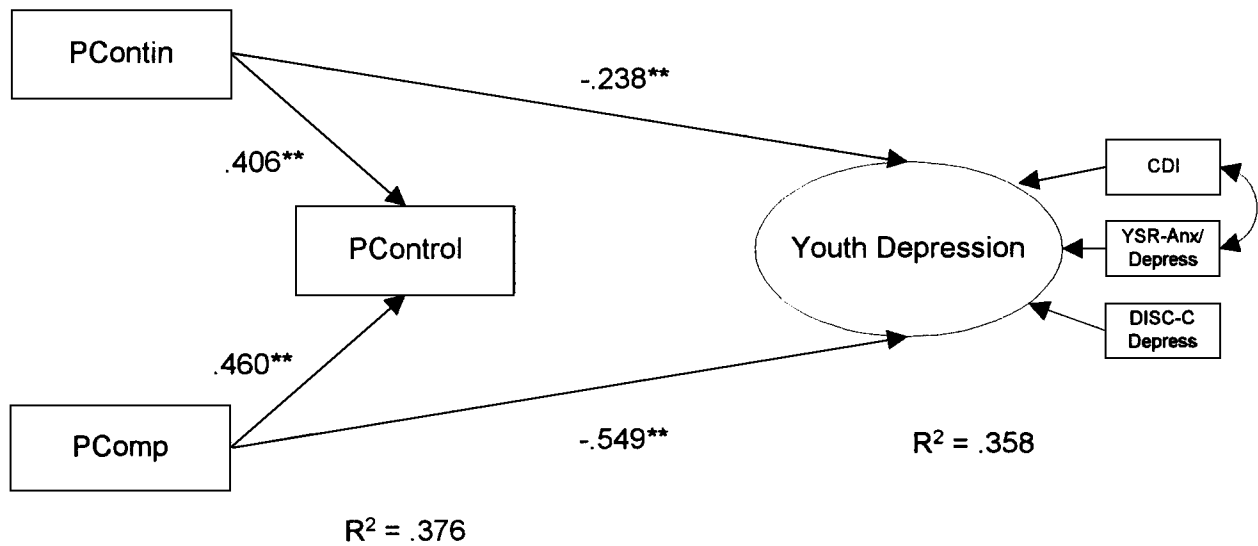
The resulting model for the child-only sample is shown in Figure 3 (top). Model fit was acceptable (CFI = .977, IFI = .977, RMSEA = .065), SBSS $\chi^2(8, N = 161) = 13.66, p < .09$. In this model, Pcontrol was predicted by Pcomp and Pcontin ($R^2 = .420$), and Pcomp and Pcontrol predicted depression, accounting for 43% of the variance in depression. For adolescents, we dropped the nonsignificant path between Pcontrol and depression from the model. The Lagrange multiplier test was significant, and we added a correlational path between the error terms of the CDI and YSR Anxious-Depressed scales. The resulting best fit model for the adolescent-only sample is shown in Figure 3 (bottom). Model fit was acceptable (CFI = .960, IFI = .961, RMSEA = .094), SBSS $\chi^2(7, N = 199) = 19.11, p < .008$. In this model, Pcontrol was predicted by Pcomp and Pcontin ($R^2 = .376$), both of which predicted depression, together accounting for 36% of the variance.

Analyses in the preceding paragraph indicated that Pcontin did not have a direct association with depression in the best fit model for children, which included Pcontrol. To understand the child findings as fully as possible, we tested a forced model, formed by removing the path from Pcontrol to depression and adding a path from Pcontin to depression. With Pcontrol thus forcibly removed, the path between Pcontin and depression was strengthened (from $-.078$ to $-.250$), suggesting an association, albeit one that was largely accounted for by Pcontrol. Thus, the findings for children showed an indirect path from Pcontin to depression, mediated

through Pcontrol. In contrast, the findings for adolescents showed a direct path from Pcontin to depression.

Analyses With Parent-Report Depression Measures

Because the CCC model applies specifically to self-reported control-related beliefs, and its application to mood dysfunction concerns depressive symptoms as experienced and reported by youngsters themselves, analyses for this study have emphasized self-reported control beliefs and self-reported depression symptoms. However, to present a complete picture, we explored whether there might be any relation between parent-reported youth depressive symptoms and children's control beliefs. Note that, as is commonly reported, parents and youth showed little agreement on the children's depressive symptoms (see Table 1; mean r between parent-report and youth-report depression measures = .14). Our test of the original CCC model yielded CFI of .955, IFI of .956, and RMSEA of .114, SBSS $\chi^2(3, N = 360) = 17.096, p < .001$. The path coefficients revealed that youth beliefs about competence and contingency were not related to parent-reported youth depression (path coefficients: $-.069$ and $-.080$, respectively). So a model was created that included a path from Pcontrol (but not Pcomp or Pcontin) to parent-reported youth depression. The fit of this best fitting parent-reported depression model (shown in Figure 4, top) was similar to the fit of the model for youth-reported

CHILDREN:**ADOLESCENTS:**

** $p < .01$

Figure 3. Best-fitting models for youth-reported depression, for children (top) and adolescents (bottom). PContin = Perceived Contingency Scale for Children; PControl = Perceived Control Scale for Children; PComp = Self-Perception Profile for Children; CDI = Children's Depression Inventory; YSR = Youth Self-Report; DISC-C = Diagnostic Interview Schedule for Children, Child Form. Anx/Depress = Anxiety/Depression. ** $p < .01$.

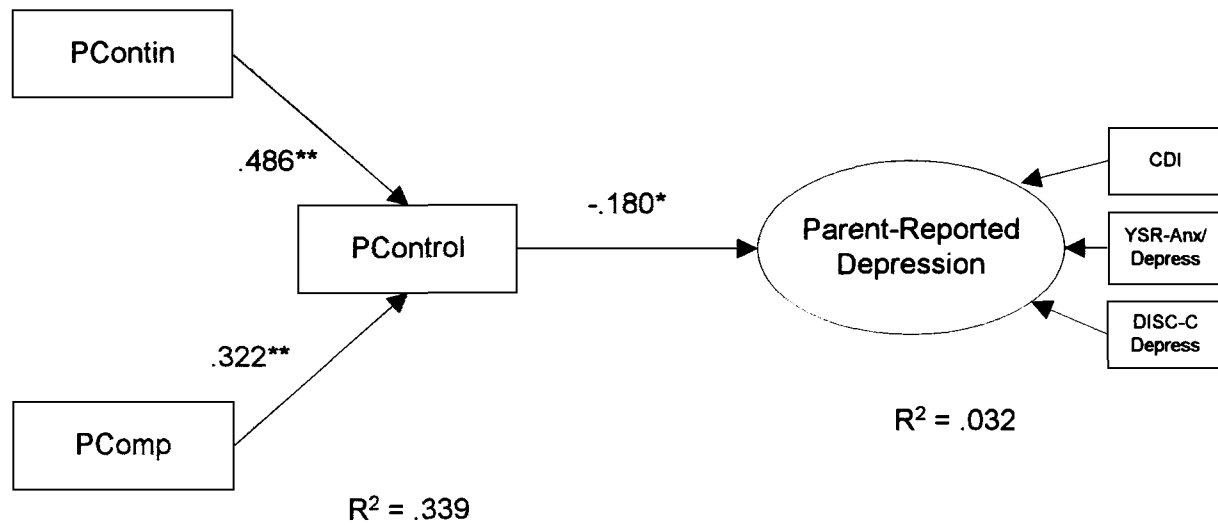
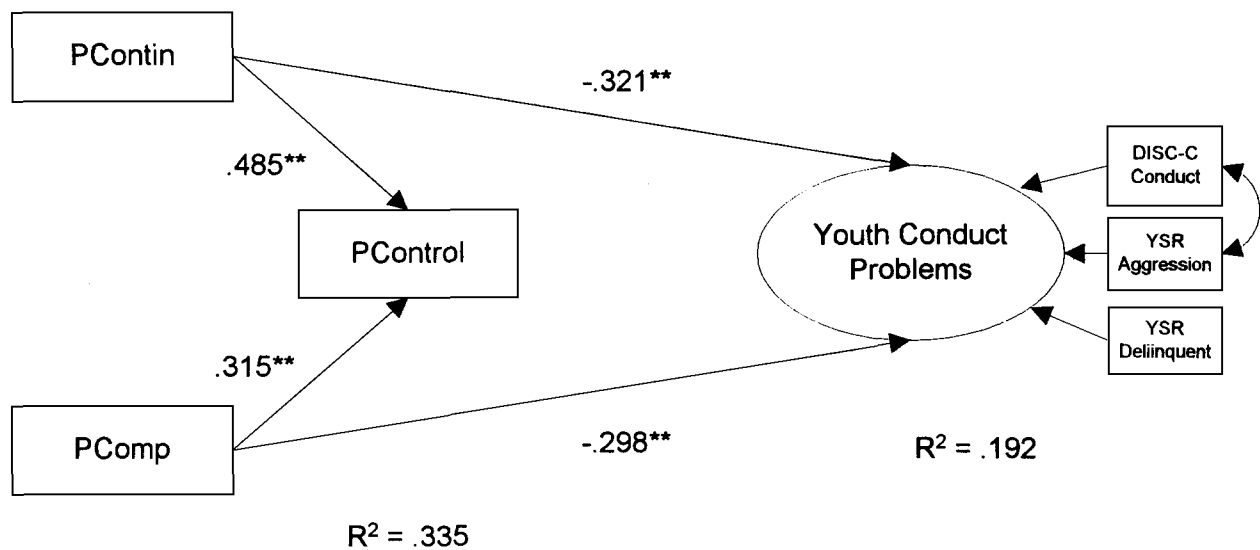
PARENT:**YOUTH-REPORTED CONDUCT PROBLEMS:**

Figure 4. Best-fitting model for parent-reported youth depression (top) and for youth-reported conduct disorder symptoms (bottom). PContin = Perceived Contingency Scale for Children; PControl = Perceived Control Scale for Children; PComp = Self-Perception Profile for Children; CDI = Children's Depression Inventory; YSR = Youth Self-Report; DISC-C = Diagnostic Interview Schedule for Children, Child Form. Anx/Depress = Anxiety/Depression. * $p < .05$. ** $p < .01$.

depression (CFI = .955, IFI = .955, RMSEA = .090), SBSS $\chi^2(5, N = 360) = 19.62, p = .002$. However, this model was not strong in psychopathology terms; it explained a very modest proportion of the variance in depression ($R^2 = .03$).

Specificity Tests

Previous literature on the CCC model has emphasized its relevance to depression, but it is possible that the model applies to

other forms of psychopathology. As a specificity test, we ran a model in which control-related beliefs were construed as predictors of youth self-reported conduct disorder symptoms. In this model, the latent variable youth conduct symptoms represents child self-reported conduct symptoms as measured by the YSR Aggressive subscale, the YSR Delinquency subscale, and the symptom count from the DISC-C conduct disorder module. The fit statistics for the full CCC model were CFI of .937, IFI of .938, and RMSEA of .118, SBSS $\chi^2(7, N = 360) = 43.40, p > .00001$. The path coefficients indicated that Pcontin and Pcomp were significantly related to CD symptoms but Pcontrol was not. Subsequently, a better fitting model was created by dropping the Pcontrol path and adding correlations between the error terms for the DISC-C and the other two measures of conduct symptoms. Each modification was supported by the chi-square difference test.

Figure 4 (bottom) shows the best fitting model for conduct disorder, with standardized beta coefficients for each of the paths. The overall model index values for the best fit CCC model for conduct disorder were similar to those found for depression: CFI of .959, IFI of .960, and RMSEA of .095, $\chi^2(7, N = 306) = 30.6, p < .001$, but the combination of these control-related beliefs explained less than half the proportion of variance in conduct disorder (19%) as in depression (46%). In interpreting the model fit findings for conduct problems versus depression, it is useful to bear in mind that any test focused on conduct problems is also focused to some degree on depression, given the rather substantial covariation among the two. Correlations of the three conduct measures with the three depression measures ranged from .244 to .562 ($M = .388$). Thus, a certain amount of overlap between findings with conduct problems and findings with depression was inevitable, given the moderate overlap between the two symptom clusters.

Discussion

This study provided the most comprehensive assessment to date of the CCC model for depression, including psychometrically sound measurement, a clinically relevant sample, multimethod assessment of psychopathology, and an age range broad enough to reveal developmental differences. Consistent with the core CCC model of control (i.e., independently of depression), both perceived contingency and perceived competence predicted perceived control, among both children and adolescents. In addition, findings underscored the robust relation between young people's control-related beliefs and their subjective experience of depression. Fit statistics supported the overall model for depression when applied to the full sample; the best fitting model accounted for 46% of the variance in self-reported depressive symptoms.

When we separated the child and adolescent subsamples, findings suggested a theoretically important developmental difference in the association between depression and the different control-related belief dimensions. Specifically, a direct relationship between low perceived contingency and depression belonged in the best fit model for adolescents but not for children. Among children, unlike adolescents, perceived contingency showed only an indirect association with depression, mediated through perceptions of control. Substantively, this suggests that, for the average preadolescent child, unlike for the average adolescent, beliefs about the contingency of outcomes among young people in general may

be associated with depression only to the extent that such beliefs influence the child's views about his or her own personal control.

It is possible, in principle, that any developmental difference we report in regard to perceived contingency might reflect a measurement artifact (e.g., the Pcontin measure might have done a better job of assessing contingency beliefs in adolescents than in children). However, this explanation does not seem feasible in light of the fact that the Pcontin measure showed similar internal consistency (.82 vs. .86) and test-retest reliability (.67 vs. .70) for children and adolescents in our sample, and that Pcontin predicted perceived control quite well for 8- to 11-year-olds (path coefficient = .58). So a substantive interpretation of the age group difference seems warranted.

The findings suggest that for preadolescent children beliefs about the contingency of events are strongly related to beliefs about whether events are controllable but not directly related to depression. Among adolescents, by contrast, low levels of both perceived competence and perceived contingency appear to be directly associated with depression. This is consistent with prior literature on control beliefs (see, e.g., Weisz, 1986, 1990) suggesting that, before adolescence, the concept of noncontingency without direct personal implications may not generate much negative affect. The notion that outcomes in the world occur noncontingently for kids in general may be too impersonal to have a significant impact on mood or other depressive symptoms before the adolescent burst of abstract reasoning, encompassing events beyond one's own concrete experience (as in formal operations, described by Piaget, 1954, 1960). It is also possible that cognitions that are rather dispassionate, or "cool," in childhood ("Kids often don't get what they deserve; life is unfair") produce more affect (e.g., sadness, hopelessness, and other depressive symptoms) when combined with hormonal changes of adolescence (e.g., maturation of the neurotransmitter systems linked to emotion).

In adolescence, our data suggest the perception that outcomes occur noncontingently may have genuine affective consequences. A perception that grades in school do not depend on how hard students work or that kids may try hard to be nice but still not have friends may genuinely sadden adolescents; children, our findings suggest, may only be saddened to the extent that such perceptions undermine a belief in their own personal control (e.g., "If grades don't depend on how hard kids work, then I could work hard and still get bad grades"). Our findings bring to mind an observation by Rothbaum and Weisz (1989) that adolescents are more likely than children to be truly saddened by such noncontingencies as inequities in our legal system or that "bad things happen to good people" (see pp. 93–94), conditions involving people in general but not directly involving self.

Put simply, depression in childhood may be largely a matter of beliefs about self (how competent I am in various skill domains, how much control I have over outcomes) rather than beliefs about the world (how contingent various outcomes are for kids in general). In adolescence, by contrast, beliefs about self and beliefs about contingencies in the world may both have significant implications for mood and other depressive symptoms. As this summation suggests, the clearest developmental constant in our findings was that depression was strongly associated with low perceived personal competence across the age range of our sample; competence beliefs were more strongly associated with depression than

were contingency beliefs not only in children but also in adolescents.

It is useful to consider our findings in light of current efforts at prevention and treatment of child and adolescent depression (e.g., Beardslee, Versage, Salt, & Wright, in press; Clarke, Hawkins, Murphy, Sheeber, Lewinsohn, & Seeley, 1995; Jaycox, Reivich, Gillham, & Seligman, 1994; Kaslow & Thompson, 1998; Lewinsohn, Clarke, Hops, & Andrews, 1990; Weisz, Valeri, McCarty, & Moore, 1999). Most intervention programs of both types involve cognitive-behavioral procedures that include among their goals (a) building skills, such as those involved in social interaction with peers; (b) modifying cognitions about self, such as the belief that "I'm no good at anything"; and (c) altering ideas about the environment, such as the belief that teachers are unfair and what kids do does not really matter. The findings of the present study suggest that the first two goals touch on themes (e.g., personal competence) that are quite central to depression across the child-adolescent age range. The third goal, in contrast, addresses contingency beliefs, a domain that appears relevant to depression in adolescence, but perhaps not in childhood, once the variance associated with perceived competence and control have been accounted for. Thus, the present findings appear consistent with a treatment emphasis on skill building and perceived competence enhancing in intervention programs for children and adolescents. However, the findings raise questions about the value of contingency-related treatment components with preadolescent children. Thus, the results of the study have potential implications for both the developmental psychopathology of depression and intervention in childhood and adolescence.

Two other issues addressed in the study warrant attention here. First, we assessed whether the youth cognitions encompassed within the CCC model would relate at all to parent-reported youth depression. We found that youths' perceived control did show a modest relationship with parent reports of youth depression, but with only 3% of the variance accounted for. Of course, as noted early here, most research shows youth and parent reports of youth psychopathology to be poorly correlated, especially within the internalizing dimension (see, e.g., Achenbach et al., 1987). Some evidence indicates that child reports correspond more closely than parent reports to clinician judgments of depression (Rubio-Stipec et al., 1994), and several reviews (e.g., Hammen & Rudolph, 1996; Schwartz et al., 1998) have suggested that youth self-reports are more credible than parent reports when it comes to youth internalizing problems; however, debate continues. Apart from the debate, which will not be resolved by our study, it is worthwhile to note that most youth depression treatment and prevention efforts focus specifically on the youth themselves, their beliefs, and their own experience of depression, not on what their parents perceive. Thus, a model and research program focused on young people's cognitions and their own subjective experience of depression seems quite relevant to the task of designing effective interventions.

We also assessed the specificity of the CCC model to depression. It is certainly possible that control-related beliefs play a role in forms of psychopathology other than depression, and our findings did show a modest association between control beliefs and conduct disorder symptoms. However, the beliefs accounted for a much lower proportion of the variance in conduct symptoms than in depression symptoms; and some of the belief-conduct relationship reflects the marked covariation of conduct and depressive

symptoms in our clinical sample. Our findings thus support the relative specificity of the CCC model, indicating that control-related beliefs may be especially important in depression. Note, also, that the contrast between findings for depression and findings for conduct disorder symptoms suggests that the depression findings did not result merely from shared method variance associated with reliance on self-report measures.

Finally, we stress that (a) our cross-sectional study could not establish whether control-related beliefs are *causes* of depression (vs. *consequences* or mere *epiphenomena*), and (b) even if they are causes, such beliefs are only part of a complex causal network. To understand depression fully, we ultimately need longitudinal tests and multifactor models (see Kazdin & Kagan, 1994; Tolan, Guerra, & Kendall, 1995). Our findings suggest that control-related beliefs can explain substantial variance in youth depression (36% in the original model, 46% in the best fit model), but this leaves considerable variance to be accounted for by other factors (e.g., other cognitions, biological processes, and social-environmental conditions; see Hammen & Rudolph, 1996; Rudolph, Kurlakowsky, & Conley, in press; Weisz, Rudolph, Granger, & Sweeney, 1992). Thus, a long-term objective of theory and research must be to discern the appropriate place for control-related beliefs within a comprehensive developmental account of depression in children and adolescents.

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