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A Longitudinal Study of Children's Depressive Symptoms, Self-Perceptions, and Cognitive Distortions about the Self

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Abstract

The purpose of this longitudinal study was to examine how depressive symptoms relate to children's self-perceptions and estimates of children's cognitive distortions about the self in a non-clinical sample of children who were followed from fourth-grade (n=248) through sixth-grade (n=227). Report card grades in reading and math were obtained to measure children's academic competence, and teachers' ratings of children's level of peer acceptance at school served as the indicator of social acceptance. The longitudinal data suggested that depressive symptomatology may have a negative impact on a child's ability to develop a healthy self-concept. Self-reported depressive symptoms predicted a change in children's negative views of the self. Moreover, the self- perceptions of children who exhibited more symptoms of depression appeared to reflect an underestimation of their actual competence, as represented by the more objective indicators of performance. Children's negative self-perceptions and underestimations about the self were not associated with a subsequent change in depressive symptoms. The implications of the findings for cognitive theories of depression and future research with this population are discussed.

A Longitudinal Study of Children's Depressive Symptoms, Self-Perceptions, and Cognitive Distortions about the Self

Cognitive theory suggests that cognitions, particularly negative beliefs about the self, are related to the etiology of depression (Beck, 1967, 1976). Two of the most basic assumptions of the theory, that (a) cognition has causal priority over emotions, and that (b) depressed children's negative beliefs about the self reflect distortions of reality, have rarely been tested in the childhood depression literature (for reviews, see Garber, Quiggle, & Shanley, 1990; Hammen, 1990). The current study used a prospective longitudinal design to test associations between depressive symptoms and two dimensions of children's self-perceptions: the overall evaluation of the self and the accuracy of that judgment. First, the study tested whether negative self-perceptions are associated with subsequent increases in signs of depressive symptoms or whether the reverse is true, i.e. depressed mood predicts to a more negative view of the self. Second, estimating negative biases in children's judgments about the self, the study examined whether underestimations of competence are a risk factor for future depressive symptomatology. The reverse causal model was also tested.

Negative Self-Perceptions

Both children with non-clinical levels of depressive symptoms, as well as clinically depressed children, view themselves negatively. Evidence suggests that depressed children are unhappy with themselves and hold negative expectations about the future (e.g. Asarnow & Bates, 1988; McCauley, Mitchell, Burke & Moss, 1988), do not believe they can solve their problems (Weisz, Sweeney, Proffitt & Carr, 1993), and are critical of their academic and social competence (see Hammen, 1990; Hammen & Rudolph, 1996 for reviews). However, there is disagreement in the childhood depression literature as to whether negative self-perceptions may lead to depression or whether depression causes a negative view of the self (Garber, Quiggle, & Shanley, 1990). Three longitudinal studies of middle childhood and early adolescence

(Robinson, Garber, & Hilsman, 1995; DuBois, Felner, Bartels, & Silverman, 1995; Hammen, 1988) found that lower self-esteem predicted a change in depressive symptoms over 6-12 months. However, none of these studies tested the reverse causal model to determine whether depressive symptoms predicted a change in self-esteem over time. Findings such as these (based on both clinical and non-clinical samples of depressed children) indicate that reports of low self-esteem may temporally precede changes in depressive symptoms and are consistent with the cognitive theory of depression. In an attempt to replicate these research findings, this study tested the hypothesis that children's negative self-perceptions predict a change in depressive symptomatology over time (Hypothesis 1). Three different components of children's self-perceptions were examined: global self-worth, self-perceived academic competence, and self-perceived social acceptance. Prior research with this age group has demonstrated the importance of assessing domain-specific judgments of competence as well as overall perceptions of one's value as a person (Harter, 1985).

While negative self-perceptions are believed to make one vulnerable to depression, it is also possible that depressive symptoms influence one's negative self-perceptions (Teasdale, 1983). Proponents of this viewpoint have argued that negative self-perceptions are symptoms of, rather than contributors to, depression. At least four studies have found that clinically depressed children's and adolescent's self-perceptions improve as their depressive symptoms remit (Asarnow & Bates, 1988; Gotlib, Lewinsohn, Seeley, Rohde & Redner, 1993; McCauley et al., 1988; Tems, Stewart, Skinner, Hughes & Emslie, 1993). These findings suggest that a negative self-perception may be a state-dependent symptom of depression rather a stable characteristic of depressed children.

While negative self-perceptions may remit with depression, it remains unclear whether or not they play any role in the onset, maintenance or exacerbation of depression. In addition, whether or not the level of depressive symptoms typically observed in a *non-clinical* sample of

children would influence the children's self-perceptions over time has rarely been examined in the literature. This study tested the hypothesis that depressive symptoms predict a change in children's negative self-perceptions over time (Hypothesis 2). It is important to note that Hypothesis 1 and Hypothesis 2 are not mutually exclusive. That is, negative self-perceptions may make children more vulnerable to other symptoms of depression, and depressive symptoms, in turn, may diminish feelings of self-worth.

Cognitive Distortions

Beck's (1967; 1976) cognitive theory of depression suggests that depressed children's negative self-perceptions reflect cognitive distortions about the self. Beck's theory has prompted research testing whether children with depressive symptomatology engage in distorted patterns of thinking. Some of these studies have employed measures that ask children about hypothetical situations to determine if their thinking reflects distorted processing of information (e.g., Children's Negative Cognitive Error Questionnaire (CNCEQ), Leitenberg, Yost, & Carroll-Wilson, 1986; Cognitive Bias Questionnaire for Children (CBQC), Haley, Fine, Marriage, Moretti, & Freeman, 1985). Others have used more objective indicators of children's circumstances, in addition to subjective reports, in order to demonstrate that depressed children distort information about themselves (e.g., Asarnow, Carlson, & Guthrie, 1987; McGee, Anderson, Williams & Silva, 1986; Meyer, Dyck, & Petrinack, 1989; Kendall, Stark, & Adam 1990). For example, Asarnow et al. (1987) found that although depressed children saw themselves as less academically competent, they did not differ from nondepressed children in terms of IQ or actual achievement. These studies support the cognitive model in showing that depressed children's negative self-appraisals may, at least in part, reflect cognitive distortions. In particular, the evidence suggests that children with depressive symptomatology negatively distort information about their academic competence.

Longitudinal studies are needed in order to determine whether cognitive distortions

precede or follow the appearance of depressive symptoms. Cognitive theories maintain that cognitive distortions place one at risk for depression and not the reverse (Beck, 1967). However, three recent analyses of data from a non-clinical sample of children addressed this question and reported conflicting results. Cole and his colleagues (Cole, Martin, Peeke, Seroczynski, & Hoffman, 1998; Cole, Martin, Peeke, Seroczynski, & Fier, 1999) examined third through eighth graders' perceptions of their competence in several areas in relation to ratings provided by others, such as teachers, peers, and parents. There was very little support for the hypothesis that cognitive errors of underestimation are associated with a change in depressive symptoms (for the single exception, see Hoffman, Cole, Martin, Tram, & Seroczynski, in press). However, in all but one of the analyses reported by Cole and his colleagues, depression scores at the beginning of the school year predicted children's underestimation of their own academic and social competence at the end of the school year.

The present study also tested the theoretical position that cognitive distortions play an etiologic role in depression among children. The accuracy of children's self-judgments were assessed in two life domains that are critical for this age group: academic performance and social acceptance at school. Hypothesis 3 stated that children's underestimation of their actual social and/or academic competence predicts a change in depressive symptomatology over time. Cognitive distortions were measured by creating variables that reflect the accuracy of children's self-perceptions, relative to independent indicators of children's competence. Report card grades and teacher-reported peer problems served as more objective indicators of children's academic and social performance. Of course, teacher evaluations are not purely objective nor completely accurate indicators of children's academic and social performance. Other factors, such as additional information children have about their academic and social performance (e.g., feedback from parents; friendships outside of the classroom), may also contribute to children's self-evaluations (McGrath & Repetti, 2000; Repetti, McGrath, & Ishikawa, 1999). Hence, we

attempt only to *estimate* children's cognitive distortions about the self, with the understanding that discrepancies between self- and teacher-ratings do not always necessarily reflect distortions.

Whereas cognitive theories suggest that negative cognitive errors make one vulnerable to depression, some of the findings reported by Cole and his colleagues (Cole et al., 1998; Cole et al., 1999; Hoffman et al., in press) suggest the reverse. That is, in a non-clinical sample of children, depressive symptoms predicted more negative perceptual biases over time. This study also tested the hypothesis that symptoms of depression predict a change in children's underestimation of their academic and/or social competence over time (Hypothesis 4). A replication of this pattern in a different sample, utilizing different measures of children's cognitive distortions about the self, would question a basic assumption of cognitive theories of depression as applied to non-clinical samples of depressed youth.

The current study differs from most previous work in several important ways. First, official report-card grades are used as the more objective indicator of academic performance, as opposed to questionnaire data collected from teachers within the context of a research study. As noted by Cole and his colleagues (Cole et al., 1999), in order for a negative self-perception to be considered erroneous, children must receive and misinterpret positive feedback related to their competence. By using report card grades, the current approach allowed for a more direct assessment of the extent to which a child distorts information contained in feedback that was actually received about his or her academic performance. Second, the present study uses multiple reporters of children's symptoms of depression in order to gain a more comprehensive picture of children's emotional functioning. Depressive symptoms are measured by (a) children's self-reports and (b) the average of mothers' and teachers' reports of depressive symptomatology (Hoffman et al., in press, also obtained parents' reports). Third, this study extends the current literature by controlling for children's externalizing symptoms in tests of all the hypotheses in order to assess the unique association between depression and self-evaluations.

Externalizing symptoms have been linked to children's depressive symptoms (Cole & Carpentieri, 1990), negative self-perceptions (Compas, Phares, Banez, & Howell, 1991), academic underachievement (Hinshaw, 1992) and problematic peer relationships (Parker, Rubin, Price, & DeRosier, 1995). Findings such as these raise important questions about the specificity of risk factors associated with depressive symptoms (Compas & Hammen, 1994; Hammen 1990). It is therefore important to rule out the possibility that externalizing behavior problems account for some or all of the observed links between depressive symptoms, children's self-perceptions, and cognitive distortions about the self.

Method

Procedures

The data for this study were collected as part of a larger longitudinal investigation of stress and family development, involving annual collections of interview data from elementary-school age children and questionnaire data from their parents and teachers over a period of three years (fourth- through sixth-grade). Parents of fourth-grade children from three schools, one parochial and two public schools in a large metropolitan area, were sent letters describing the study. Children who agreed to participate, and whose parents returned consent forms, completed annual interviews and their parents and teachers were asked to complete questionnaires. In exchange for their participation each year, children received $5.00 to $10.00 and parents received $10.00 to $20.00, with the honorarium increasing over the 3 years of the family's participation. Teachers received $5.00 for each completed child questionnaire.

Participants

Cohorts of fourth-grade children were recruited into the study in each of 3 consecutive years. A total of 677 families with fourth graders were invited to participate, and parental consent was obtained from 248 (37%) of the families. Time 1 interviews were completed with 248 children (116 girls and 132 boys; children's average age was 9.5 years) and 218 mothers

returned questionnaires, reflecting an overall maternal response rate of 88%. The study maintained high retention rates over 3 years (230 child interviews and 195 parent questionnaires when the children were in fifth-grade, at Time 2; 227 child interviews and 186 parent questionnaires when the children were in sixth-grade, at Time 3). Teacher questionnaires were completed for approximately 86% of the children at each time point. In order to analyze the effects of attrition, children who were retained from Time 1 to Time 3 were compared to children who withdrew from the study after Time 1 participation. T-tests indicated there were no significant differences between the two groups of children on Time 1 scores on depressive symptoms, externalizing symptoms, self-perceptions, or cognitive distortions. The sample consisted primarily of high income, highly educated Caucasian parents and their children. Approximately 81% of the parents who participated identified themselves as Caucasian (8% as Asian/Pacific Islander, 4% as Latino, 1% as African American, 1% as Native American, and 5% as Other). More than half of the families (54%) reported earning more than $80,000 per year, and over 80% of the parents were college graduates.

Measures

Emotional/Behavioral Functioning

Depressive Symptoms: Children's Self-Reports. The first indicator of children's depressive symptoms was children's self-reports on the Children's Depression Inventory (CDI) (Kovacs, 1992). The CDI is a 27-item questionnaire that assesses affective, behavioral, somatic, and cognitive aspects of depressive symptomatology. Evidence suggests that this widely used scale has good internal consistency (Cronbach's alpha = .85 in the current study), test-retest reliability, concurrent validity, and validity as a screening measure for depressive symptomatology in non-clinic samples (Kovacs, 1992; Carey, Faulstich, Gresham, Ruggiero, & Enyart, 1987).

For each item on the CDI, children were asked to indicate which of three sentences best

described how they had been feeling during the last two weeks. An example is "I am sad once in awhile; I am sad many times; I am sad all the time." Each sentence was assigned a value from 0-2, with higher scores reflective greater symptom severity. Responses to the 27 items were summed. Children's scores (see Table 1) were lower but fell within one standard deviation of the national norms (Kovacs, 1992). Approximately 80% of children scored below 9 at each time point, a cutoff score used to signify mild depressive symptomatology (e.g., Rudolph, Hammen, and Burge, 1997). Children's scores ranged from 0-38 at Time 1, 0-29 at Time 2, and 0-35 at Time 3. T-tests indicated there were no differences between girls' and boys' self-reports at any of the three time points. There were high rates of stability in the depression variable over three years (r =.55 to r =.67, p< .001).

Depressive Symptoms: Parents' Reports. Mothers' reports on the 14-item anxious/depressed syndrome scale of the Child Behavior Checklist (CBCL) served as the second indicator of children's depressive symptoms. The CBCL consists of 118 items that assess children's internalizing and externalizing behavior problems. This widely-used measure has been shown to be reliable (Cronbach's alpha for the anxious/depressed syndrome scale = .81 in the current study), stable, and valid (Achenbach, 1978; Achenbach & Edelbrock, 1979). Utilizing principal components analyses, Achenbach found that depressive and anxious symptoms on the CBCL are closely intertwined and difficult to tease apart (Achenbach, 1991a), which is consistent with research indicating high rates of comorbidity between depression and anxiety in children (Compas & Hammen, 1994). A sample item from the anxious/depressed syndrome scale is "Unhappy, sad, or depressed." Mothers were asked to circle (0) if the item was not true of the child, (1) if the item was sometimes true of the child, and (2) if the item was often true of the child during the previous 6 months. On average, mothers reported low levels of depressive symptoms in their children (see Table 1). These ratings were comparable to norms on the anxious/depressed subscale from a national sample of non-referred 4-11 year-old children. T-

tests indicated that there were no differences between mothers' reports of depressive symptoms for girls and boys at any of the three time points.

Depressive Symptoms: Teachers' Reports. Teachers' ratings on the anxious/depressed syndrome scale of the Teacher Report Form (TRF) served as the third indicator of children's depressive symptoms. The TRF is comparable to the CBCL and has also been shown to be reliable, stable, and valid (Edelbrock & Achenbach, 1984; Edelbrock, Greenbaum, & Conover, 1985). The anxious/depressed syndrome scale on the TRF is comprised of 18 items which are rated in the same manner as the CBCL. The scale had good internal consistency in the current study (Cronbach's alpha = .86). Teachers' ratings in this study (see Table 1) were slightly lower than the norms on the anxious/depressed subscale from a national sample of teachers of non-referred 5-11 year-old children. T-tests indicated that there were no differences between teachers' reports of depressive symptoms for girls and boys at any of the three time points.

There were moderate, significant cross-sectional correlations (ranging from $r = .20$ to $r = .30$) between mothers' and teachers' reports of depressive symptoms at all three time points (all significant at $p < .01$). Mothers' and teachers' scores were averaged to create a composite depression variable. Before averaging, mothers' and teachers' scores were each standardized to a mean of 0 and standard deviation of 1. T-tests revealed no sex differences between girls' and boys' composite scores, which were highly stable over three years ($r = .48$ to $r = .55$, $p < .001$).

Externalizing Behavior Problems: Children's Reports. The first indicator of externalizing problems was children's self-reports on the 6-item behavioral conduct subscale of the valid and reliable Self Perception Profile for Children (SPPC; Harter, 1985). The scale measures a child's perceptions of his or her behavior, and had good internal consistency in the current study (Cronbach's alpha = .81). An example of one item is "Some kids usually get into trouble because of the things they do BUT Other kids usually don't do things that get them in trouble." The other items tapped into children's perceptions of how they act, whether or not they do the right thing,

and if they are happy with their behavior. Each item was scored from 1-4 and the mean of the six items was calculated. The items were reverse scored in this study so that higher scores reflected perceptions of more problematic behavioral conduct. Boys perceived their behavior to be more problematic than girls.[1] The means on the behavioral conduct subscale of the SPPC (see Table 1) were similar to the norms (Harter, 1985).

Externalizing Behavior Problems: Parents' Reports. Mothers' reports on the externalizing syndrome scale of the CBCL served as the second indicator of children's externalizing behavior problems. This widely-used measure has been shown to be reliable, stable, and valid (Achenbach, 1978; Achenbach, 1991a; Achenbach & Edelbrock, 1979). The externalizing syndrome scale describes 33 delinquent and aggressive child behaviors, and had good internal consistency in the current study (Cronbach's alpha = .87). A sample item from the externalizing scale is "Gets in many fights." The sum of mothers' ratings was computed using the CBCL response scale described above, with higher scores indicating more externalizing behavior problems. Mothers' ratings on the externalizing syndrome scale (see Table 1) were slightly lower than the national norms for children ages 4-11. A marginally significant t-test (t (216) = 1.66, p<.10) indicated that mothers reported more externalizing symptoms in fourth-grade boys than in girls. The differences were not significant for fifth- and sixth-grade children.

Externalizing Behavior Problems: Teachers' Reports. Teachers' reports on the externalizing syndrome scale of the TRF served as the third indicator of children's externalizing behavior problems. The TRF is comparable to the CBCL and has also been shown to be reliable, stable, and valid (Achenbach, 1991b; Edelbrock & Achenbach, 1984; Edelbrock, Greenbaum, & Conover, 1985). The externalizing syndrome scale on the TRF is comprised of 34 items that describe delinquent and aggressive child behaviors; the items are rated in the same manner as the CBCL. The scale had high internal consistency in the current study (Cronbach's alpha = .95). Teachers' reports (see Table 1) were also slightly lower than the national norms for non-referred

children ages 5-11. Teachers reported more externalizing symptoms in boys than in girls.[2]

There were moderate, significant cross-sectional correlations (ranging from r =.29 to r =.39) between mothers' and teachers' reports of externalizing behavior problems at all three time points (all significant at $p<.001$). Mothers' and teachers' reports of externalizing symptoms were averaged together to create a composite measure of children's externalizing symptoms. Before taking the average of the two scales, mothers' and teachers' scores were each standardized to a mean of 0 and standard deviation of 1. T-tests revealed sex differences on the composite externalizing variable at Time 1 (t (243) = 2.11, $p<.05$) and Time 2 (t (227) = 2.03, $p<.05$), and a marginally significant difference at Time 3 (t (210) = 1.75, $p<.10$). At each time point, the composite scores were higher for boys than for girls. There were high rates of stability over three years (r =.63 to r =.68, $p<.001$).[3]

Children's Self-Perceptions

Perceptions of Global Self-Worth. Three indicators of children's self-perceptions were obtained with the valid and reliable Self Perception Profile for Children (SPPC; Harter, 1985). The first indicator was the 6-item global self-worth subscale of the SPPC. The items on this scale measure a child's global judgment of his or her worth as a person. Each item was scored from 1-4 and the mean of the six items was calculated. On all of the self-perception subscales, higher scores reflect more positive evaluations of the self. T-tests indicated there were no differences between girls' and boys' perceptions of global self-worth at any of the three time points.

Perceptions of Scholastic Competence. The second indicator of children's self-perceptions was the 6-item scholastic competence subscale of the SPPC. The six items on this scale measure a child's perceptions of his or her academic abilities. A marginally significant t-test (t (223) = 1.73, $p<.10$) indicated that sixth-grade boys tended to see themselves as more academically competent than did sixth-grade girls.

Perceptions of Social Acceptance. The 6 items on this SPPC subscale measure the degree to which a child feels accepted or popular with his or her peers. A significant t-test ($t(242) = 2.61$, $p<.01$) indicated that fourth-grade girls' scores were lower than boys' scores on the perceived social acceptance scale. The means on all three of the self-perception subscales (global self-worth, scholastic competence, and social acceptance; see Table 1) fell within one standard deviation of norms (Harter, 1985), and Cronbach's alphas ranged from .75 to .81. There were high rates of stability for each variable assessed over three years: global self-worth (r =.43 to r =.49, $p<.001$), scholastic competence (r =.45 to r =.59, $p<.001$), and social acceptance (r =.49 to r =.57, $p<.001$).

Academic Performance

Grades in Reading and Math. Children's academic competence was indicated by their achievement in two subjects, reading and math, as recorded on their report cards. Reading and math grades from the quarter in which children completed their interviews were used in the analyses. Different scales were used to assign grades for the different cohorts of children in the study. For example, fourth graders at one school were graded on a 3-point scale one year, and fourth graders at the same school over the next two years were graded on a 100-point scale. Therefore, before testing hypotheses, children's scores were standardized within each school and cohort to a mean of 0 and a standard deviation of 1. Overall, girls' and boys' reading and math grades were similar. One exception was that fifth-grade girls received significantly higher grades in reading than did fifth-grade boys ($t(217) = -2.18$, $p<.05$).

Social Acceptance

Teachers' Ratings of Peer Problems. Children's social acceptance at school was assessed by an 8-item teacher-report measure of social functioning developed for use in this study. On a 5-point Likert-type scales, teachers rated children according to (a) how well liked they are, (b) the extent to which they are disliked, (c) the number of good friends they have, (d) popularity

among their peers, (e) exclusion from play and activities organized by other children, and (f) the extent to which the child would or would not be chosen to participate in different group activities (i.e., social, athletic, academic). The scale has high internal consistency (Cronbach's alpha = .94) and correlates with other measures of social adjustment.[4] The mean of teachers' responses to the 8 items was computed, with higher scores indicating increased levels of social problems at school (see Table 1). T-tests indicated that there were no significant differences between teachers' ratings of girls' and boys' problems with peers at any of the three time points.

Cognitive Distortions

In order to estimate the accuracy of judgments about the self, multiple regression analyses were conducted in which children's self-perceptions were regressed onto independent indicators of children's competence. The standardized residuals, saved as new variables, represented the components of self-perceptions that were not explained in the regression equations by the more objective indicators of children's competence. The same statistical approach was used by Cole and his colleagues (e.g., see Cole et al., 1998) to estimate children's cognitive distortions. By definition, standardized residuals have positive and negative valences, with a mean of zero and standard deviation of one. In this study, positive residual scores reflect *overestimation* of one's competence. Negative residual scores indicated *underestimation*, or cognitive distortion in a negative direction.

Distortion in the Academic Domain. At each time point, residuals reflecting distortion in the academic domain were obtained by simultaneously regressing perceptions of academic competence onto grades in reading and math. In fourth-, fifth-, and sixth-grade, higher grades in reading and math were associated with perceptions of more academic competence. A significant portion of the variance in perceived academic competence was explained by grades in reading and math at all three time points (14-23%). Children's distortion scores ranged from -2.93 to 2.40 at Time 1, -3.08 to 2.05 at Time 2, and -3.04 to 2.16 at Time 3. There was a marginally

significant sex difference in fifth-grade (t (213) = 1.78, p<.10) and a significant sex difference in sixth-grade (t (195) = 2.51, p<.05), indicating boys were more likely to overestimate and girls were more likely to underestimate their academic competence. The academic distortion variable was stable over three years (r= .36 to r= .48, p<.001).

Distortion in the Social Domain. Three residuals reflecting distortion in the social domain were obtained by regressing perceptions of social competence onto teachers' ratings of peer problems at each of the three time points. A small but significant portion of the variance in perceived social acceptance was explained by teachers' ratings of peer problems across the three years of the study (3-15%). Higher levels of teacher reported peer problems were associated with perceptions of less social acceptance at all three time points. Children's scores ranged from -1.70 to 1.08 at Time 1, -1.82 to 1.16 at Time 2, and -1.77 to .80 at Time 3. T-tests revealed significant sex differences at Time 1 and Time 2 (Time 1: t (240) = 2.78, p<.01; Time 2: t (203) = 2.61, p< .01). At both time points, boys tended to overestimate and girls tended to underestimate their social acceptance relative to their teachers' reports. Similar to distortion in the academic domain, the social distortion variable was very stable over three years (r= .40 to r= .48, p<.001). The cross-sectional correlations between the academic and social distortion variables ranged from r= .32 to r= .52 (all were significant at p<.001).

Results

Overview

All of the variables were measured each year in fourth-, fifth-, and sixth-grade. This allowed for three different tests of the temporal sequencing of changes in the primary variables: changes from (a) fourth- to fifth-grade (T1-T2), (b) fifth- to sixth-grade (T2-T3), and (c) fourth- to sixth-grade (T1-T3). The longitudinal hypotheses were tested using hierarchical multiple regression analyses, controlling for children's level of functioning at the first time point in each analysis. All of the analyses controlled for the main effect of externalizing symptoms, measured

by the average of mothers' and teachers' ratings, before examining the relationship between the predictor and outcome variable.[5] Each hypothesis was tested using children's self-reports as the indicator of depressive symptoms, followed by additional analyses using others' reports of children's depressive symptoms (mothers' and teachers' reports of anxious/depressed symptoms). The effects of gender and cohort were examined throughout tests of the hypotheses by controlling for the main effects of child sex and cohort and by testing the interactions between child sex and the predictor variable and between cohort and the predictor variable. None of the interactions were significant.

Negative Self-Perceptions and Depressive Symptoms

Hypothesis 1

The first hypothesis stated that children's negative self-evaluations would predict a change in depressive symptomatology over time. Hierarchical multiple regression analyses tested Hypothesis 1 separately for children's perceptions of their global self-worth, their scholastic competence, and their social competence. Three longitudinal tests (T1-T2, T2-T3, and T1-T3) were conducted with each of the three indicators of children's negative self-perceptions (the predictor variable), resulting in a total of (3x3) 9 tests of Hypothesis 1.

Of the 9 tests, only two were significant (see Tables 2 and 3). Perceptions of academic competence in fourth-grade predicted a significant change in children's self-reported depressive symptoms from fourth- to fifth-grade. In addition, children's perceptions of social competence in fourth-grade were associated with a significant change in self-reported depressive symptoms from fourth- to sixth-grade. The negative betas suggested that children with perceptions of less competence experienced higher levels of depressive symptoms over time. The other 7 tests of Hypothesis 1 were not significant (see Tables 2 and 3). In addition, comparable analyses using other-reported depressive symptoms instead of the CDI provided no evidence of a significant

effect of global, academic, or social self-perceptions on depressive symptoms. The betas for the self-perception variables were nonsignificant in all nine analyses. In summary, little evidence emerged to support the notion that children's negative self-perceptions predict a change in depressive symptomatology one or two years later.

Hypothesis 2

The second hypothesis was based on the reverse causal model. It stated that depressive symptoms would predict a change in children's negative self-perceptions over time. As in Hypothesis 1, hierarchical multiple regression analyses were conducted separately for children's perceptions of their global self-worth, their scholastic competence, and their social competence. Three longitudinal tests (T1-T2, T2-T3, and T1-T3) were conducted for each indicator of children's negative self-perceptions (the outcome variable), resulting in a total of (3x3) 9 tests of Hypothesis 2. Of the 9 tests, all were statistically significant. Children's self-reported depressive symptoms predicted a change in perceptions of global self-worth, academic competence, and social competence from fourth- to fifth-grade, fifth- to sixth-grade, and fourth- to sixth-grade (see Tables 4 and 5). The significant negative beta weights indicated that higher levels of depressive symptoms were associated with more negative self-perceptions over time. Self-reported depressive symptoms emerged as a strong predictor of children's evaluations of their competence and worth, despite the fact that the control variable, self-perception ratings obtained from one or two years earlier, removed 19-34% of the variance (see Tables 4 and 5). Moreover, the pattern of results was not attenuated by controlling for the main effect of externalizing symptoms.

Additional analyses tested Hypothesis 2 using mother- and teacher-reported depressive symptoms instead of the CDI, and three out of nine tests were statistically significant. Other-rated depressive symptoms in fourth-grade predicted a significant change in children's perceptions of academic competence from fourth- to sixth-grade ($b = -.13$, $p < .05$). In addition,

other-rated depressive symptoms predicted a significant change in children's perceptions of social competence from fifth- to sixth-grade (b= -.11, p<.05) and from fourth- to sixth-grade (b= -.12, p<.05). The negative betas suggested that mothers' and teachers' reports of more depressive symptoms predicted more negative self-perceptions over time. In summary, clear and convincing evidence emerged to support the hypothesis that self-reported depressive symptoms predict a change in children's negative self-evaluations over time. Less evidence emerged when using other-rated depressive symptoms as the predictor variable.

Cognitive Distortions and Depressive Symptoms

Hypothesis 3

The third hypothesis stated that children's underestimations of their competence would predict a change in depressive symptomatology over time. A total of three longitudinal tests of Hypothesis 3 (T1-T2, T2-T3, and T1-T3) were conducted in which the predictor variable was distortion in the academic domain. Distortion in the academic domain did not predict a change in self-reported depressive symptoms in any of the analyses (see Table 6). Three longitudinal tests (T1-T2, T2-T3, and T1-T3) were also conducted in which the predictor variable was distortion in the social domain, and only one test was statistically significant (see Table 6). Distortion in the social domain in fourth-grade predicted a change in self-reported depressive symptoms from fourth- to sixth-grade. The negative beta indicated that greater underestimation of social competence was associated with higher levels of depressive symptoms 2 years later. When Hypothesis 3 was tested using others' ratings of children's depressive symptoms rather than the CDI, none of the six tests were statistically significant. To summarize, the findings did not support the notion that negative distortions predict a change in depressive symptomatology over time.

Hypothesis 4

The final hypothesis was based on the reverse causal model. It stated that more symptoms of depression would predict a change in negative cognitive distortions over time. Three longitudinal tests (T1-T2, T2-T3, and T1-T3) were conducted using distortion in the academic domain as the outcome variable. As can be seen in Table 7, between 13-23% of the variance in children's distortions in the academic domain were accounted for by distortion scores from one or two years earlier, reflecting high rates of stability over time. Nonetheless, self-reported depressive symptoms predicted a change in negative distortions in the academic domain in all three of the longitudinal tests (see Table 7). The significant negative betas indicated that children with higher levels of depressive symptoms tended to underestimate their academic competence from fourth- to fifth- grade, fifth- to sixth-grade, and fourth- to sixth- grade.

Similar analyses were conducted to test whether self-reported depressive symptomatology would predict a change in negative distortions in the social domain. As can be seen in Table 7, between 16-23% of the variance in children's distortions in the social domain were accounted for by estimates of their distortions one or two years earlier, reflecting high rates of stability over time. Despite the high rates of stability in children's cognitive distortions, self-reported depressive symptoms predicted a change in negative distortions in the social domain in all three of the longitudinal tests (see Table 7). The significant negative betas indicated that children with higher levels of depressive symptoms tended to underestimate their social acceptance. Controls for the main effect of externalizing symptoms when testing the association between depression and cognitive distortions did not change the findings.

In contrast, only one out of six tests was statistically significant when using mother- and teacher-reported depressive symptoms rather than the CDI to test Hypothesis 4. Other-rated depressive symptoms predicted a change in negative distortions in the social domain from fifth- to sixth-grade ($b = -.15$, $p < .01$). The significant negative beta indicated that children with higher levels of depressive symptoms tended to underestimate their social acceptance. To summarize,

very strong evidence supported the notion that self-reported depressive symptomatology predicts a change in negative cognitive distortions over time, as evidenced in both the academic and social domains. Almost no support for Hypothesis 4 was found when using other-rated depressive symptoms as the predictor variable.

Discussion

The study tested certain tenants of cognitive theory of depression in a non-clinical sample of children who were followed from fourth- through sixth-grade. There were four major results. Self-reported depressive symptoms predicted a change in children's negative self-perceptions and they also predicted children's greater underestimation of their competence. Thus, the findings suggested that depressive symptomatology may lead to a negative view of the self that is not entirely based in reality. In contrast, and perhaps striking in light of cognitive theory, neither children's negative self-perceptions nor their underestimations of their competence predicted an increase in depressive symptoms over time. The study hypotheses were also tested using a composite measure of mothers' and teachers' reports of depressive symptoms, and the analyses produced much weaker results.

Negative Self-Perceptions

Consistent with prior research, children who experienced higher levels of depressive symptoms were more likely to view themselves negatively in the areas of global self-worth, scholastic competence, and social acceptance. In addition, despite high rates of stability in the self-perception variables over the three years, self-reported depressive symptoms predicted changes in children's evaluations of themselves over one to two years. These longitudinal findings extend previous work with clinical samples of depressed children (e.g., Tems et al., 1993) by controlling for earlier levels of self-esteem and examining whether depression is associated with a change in self-esteem over time. Indeed, the findings were consistent with the proposition that even mild levels of depressive symptoms may impede the development of a

healthy self-concept among normal school-age children.

Interestingly, there was much weaker evidence for the hypothesis that children's negative self-evaluations would be associated with a change in self-reported depressive symptomatology over time. This was surprising, and was inconsistent with previous reports in the childhood depression literature. For example, in a slightly older group, Robinson et al. (1995) found that feelings of less self-worth in the spring of sixth grade were associated with higher levels of depressive symptoms in the seventh grade. Additional studies (e.g., DuBois et al., 1995; Hammen, 1988) tended to combine both preadolescent and adolescent children in their sample, whereas our sample focused solely on preadolescent youth. Perhaps negative self-perceptions are more reliably associated with a change in depression symptoms among older children.

Cognitive Distortions

Both subjective and independent indicators of children's competence were assessed in order to estimate the accuracy of children's judgments about the self. This approach has rarely been used in the childhood depression literature (for an exception, see Cole et al., 1999), and it was uncertain whether the previous findings would replicate in a new sample utilizing different measures of children's competence. Grades children received in school and teacher-reported peer problems served as independent indicators of children's academic and social performance. Despite high rates of stability in the measures of cognitive distortions, higher levels of self-reported depressive symptomatology predicted a tendency for children to underestimate their academic and social functioning in six out of six longitudinal tests. It is remarkable that this particular pattern of findings, which has been reported by Cole and his colleagues (Cole et al., 1998; Cole et al., 1999; Hoffman et al., in press), replicated here in a different sample with different indicators of children's academic and social competence. In contrast, neither negative cognitive distortions in the academic nor the social domains were associated with a subsequent change in self-reported depressive symptoms in five out of six longitudinal tests. This is similar

to some findings reported by Cole and colleagues (Cole et al., 1998; Cole et al., 1999), but conflicts with the most recent set of results from the same sample of children (Hoffman et al., in press).

In summary, a pattern emerged in which self-reported depressive symptoms predicted an increase in children's negative self-perceptions and in their tendency to underestimate their competence levels. The similarity between these two findings was not surprising given that both the self-perception and cognitive distortion variables appeared to reflect a view of the self that was not entirely based on the more objective indicators of children's performance. Teachers' evaluations accounted for a significant, but relatively small portion of the variance in children's self-perceptions of competence. That is, children's self-perceptions appeared to be largely independent of teachers' evaluations of their performance.

In addition to replicating in a different sample of children, the current findings strengthen and extend previous work in two important ways. First, assessment of distortion in the academic domain was unique in this study. Children's academic self-perceptions were compared to their report card grades, as opposed to relying on confidential questionnaire data collected from teachers specifically for the purpose of a research study. This allowed for a more direct test of the extent to which children may have ignored or distorted feedback they are known to have received when constructing their academic self-perceptions. A second advance over previous research was the explicit examination of externalizing behavior problems to determine whether these problems could account for any of the observed relationships between depressive symptoms, self-evaluations, and cognitive distortions. The findings were not attenuated when controlling for the main effect of externalizing symptoms, whether those symptoms were reported by mothers and teachers, or by the children themselves. While the specific mechanisms are unknown, it appears that mild depressive symptoms may affect how children attend to, process, and use information in their social environment in order to evaluate their own

functioning.

Limitations

Several limitations of the current study warrant discussion. First, some evidence suggests that self-report measures of depression may assess negative affectivity rather than symptoms that are specific to depression (for review, see Hammen and Compas, 1994). Similar problems relate to parent- and teacher-report measures of children's depressive symptoms (Achenbach, 1991a; 1991b). Hence, the extent to which the present findings are specific to depressive symptomatology, or apply more generally to internalizing difficulties is uncertain. We note, however, that children's self-reported depressive symptoms produced more reliable findings than mothers' and teachers' ratings of children's symptoms of depression and anxiety. In addition, none of the results reported here changed when externalizing symptoms, whether self- or other-reported, were controlled in the analyses. This pattern of findings should also help to allay concerns that the results based on self-reported depressive symptoms might simply reflect the effects of a negative response bias.

Our assessment of children's cognitive distortions about the self presents other limitations. Rather than relying on questionnaires that ask children about hypothetical situations (e.g., see Haley et al., 1985; Leitenberg et al., 1986), both children's and teachers' ratings of competence were obtained in order to estimate the accuracy of children's judgments about the self. Although not subject to children's own reporting biases, teacher evaluations are not perfect indicators of children's academic and social performance. Discrepancies between self- and teacher-ratings do not necessarily reflect distortions and should be viewed only as *estimates* of children's cognitive distortions about the self.

In addition to these assessment limitations, there are several alternative explanations of the study's results that require discussion. First, while the findings in this non-clinical sample were inconsistent with one of the most basic assumptions of cognitive theory - that cognition has

causal priority over emotions - more complex cognitive models were not tested. In particular, cognitive diathesis-stress models suggest cognitive distortions are a risk factor for depression if activated by stressful life events (e.g., Abramson, Seligman, & Teasdale, 1978). More evidence for cognitive theories of depression may have emerged in the current study if stressful events in the academic and social domains were examined. Second, in this study depression scores were more stable than were children's self-perceptions and cognitive distortions about the self, which may have contributed to the failure to predict changes in depression over one or two years. Finally, this was a homogenous sample, comprised primarily of children from a white, upper-middle class population. However, it is noteworthy that this study replicated many of the findings reported by Cole and his colleagues, which were based on a more ethnically and economically diverse sample (Cole et al., 1998; Cole et al., 1999). Of course, the generalizability of these findings to children with clinical levels of depressive symptoms is an important question for future research. Despite these limitations, the data described here indicate that even mild symptoms of depression may precipitate a process by which preadolescents come to underestimate their competence and construct a negative view of the self.

Footnotes

[1] A marginally significant t-test (t (245) = 1.67, p<.10) indicated that fourth-grade boys perceived their behavior to be more problematic than did fourth-grade girls. There were significant differences in the fifth grade (t (229) = 2.73, p<.01) and in the sixth grade (t (224) = 2.58, p<.05) between boys' and girls' reports of behavior problems.

[2] Significant t-tests in fourth (t (243) = 1.93, p<.05) and fifth grade (t (205) = 2.17, p<.05) indicated that teachers reported more externalizing symptoms in boys than in girls. This trend continued in the sixth-grade, as indicated by a marginally significant t-test (t (154) = 1.68, p<.10).

[3] The mother-teacher composite measure of externalizing symptoms correlated significantly with children's reports of depressive symptoms in fourth-grade (r=.14, p<.05), but not in fifth- or sixth-grade (T2: r=.08, p=ns; T3: r=.01, p=ns). The low correlations may be due to the use of different informants because the mother-teacher composite measure of externalizing symptoms correlated significantly with the composite measure of depressive symptoms (correlations ranged from r = .46 to r = .61, p<.001). Additionally, children's self-reported behavior problems correlated significantly with their self-reported depressive symptoms (correlations ranged from r = .44 to r = .49, p<.001).

[4] Cross-sectional correlations between teacher rated peer problems and additional indicators of children's social adjustment were computed in order to examine the validity of the 8-item scale. The cross-sectional correlations between teachers' ratings of peer problems and teachers' reports on the social problems scale of the TRF (ranging from r= .62 to r= .66) were statistically significant at p<.001. Similarly, teachers' ratings correlated significantly with mothers' reports on the CBCL social problems scale (ranging from r= .38 to r= .46, p<.001). The cross-sectional correlations between teachers' ratings and children's reports on the 6-item social

acceptance subscale of the SPPC ranged from $r = -.23$ to $r = -.41$ (all were significant at $p < .01$). Taken together these findings offer support for the validity of the teacher-report measure of peer problems developed for use in this study.

[5] The multiple regression analyses controlling for the main effect of externalizing symptoms were also computed using children's self-reports of externalizing symptoms, in place of the mother and teacher composite measure. The pattern of results remained the same.

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Table 1
Means and Standard Deviations of Study Measures by Grade Level

Measure		Grade 4 (Time 1) Mean	SD	N		Grade 5 (Time 2) Mean	SD	N		Grade 6 (Time 3) Mean	SD	N
Depressive Symptoms												
Children's Reports		5.48	5.52	247	4.68	5.25	231		5.24	5.85	226	
Mothers' Reports	3.71	3.53	218		3.25	3.45	195		2.88	3.18	186	
Teachers' Reports		3.69	4.34	245		1.90	2.99	207		2.25	3.52	156
Externalizing Symptoms												
Children's Reports		1.78	0.56	247		1.67	0.56	231		1.69	0.59	226
Mothers' Reports	7.13	6.22	218		6.29	5.75	195		5.91	5.45	186	
Teachers' Reports	6.07	9.23	245		3.66	6.06	207		3.06	4.61	156	
Children's Self Perceptions												
Global Self-Worth		3.53	0.45	244		3.59	0.44	229		3.55	0.49	224
Academic		3.18	0.60	246		3.39	0.51	228		3.40	0.56	225
Social		3.24	0.62	244		3.33	0.59	229		3.33	0.58	223
Peer Problems												
Teachers' Ratings	2.29	0.91	245		2.27	0.86	207		2.15	0.72	154	

Table 2—Results of Three Hierarchical Multiple Regression Analyses Predicting Changes in Self-Reported Depressive Symptoms from Prior Levels of Children's Global Self-Worth

Predictor Variable	r	B	SE B	Beta	R-square
Dependent Variable = Grade 5 CDI[a]					
Externalizing Symptoms (4th Grade)	.03	-.48	.32	-.08	
Depressive Symptoms (4th Grade)	.67***	.60***	.06	.60	
Global Self-Worth (4th Grade)	-.46***	-1.06	.73	-.09	.44***
Dependent Variable = Grade 6 CDI[b]					
Externalizing Symptoms (5th Grade)	-.002	-.45	.38	-.07	
Depressive Symptoms (5th Grade)	.55***	.66***	.08	.54	
Global Self-Worth (5th Grade)	-.37***	-.93	.86	-.08	.33***
Dependent Variable = Grade 6 CDI[c]					
Externalizing Symptoms (4th Grade)	-.001	-.53	.38	-.08	
Depressive Symptoms (4th Grade)	.60***	.54***	.08	.52	
Global Self-Worth (4th Grade)	-.41***	-1.10	.87	-.09	.33***

Note: Gender and cohort served as control variables in all analyses. In addition, interactions with gender and with cohort were tested, but were nonsignificant.

[a] F= 57.17***, dF=(3, 223); [b] F=36.52***, dF=(3, 218); [c] F=35.03***, dF=(3, 218)

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

Table 3—Results of Six Separate Hierarchical Multiple Regression Analyses Predicting Changes in Self-Reported Depressive Symptoms from Prior Levels of Children's Self-Perceptions

Predictor Variable	r	B	SE B	Beta	R-square
Dependent Variable = Grade 5 CDI[a]					
Externalizing Symptoms (4th Grade)	.03	*.44	.32	-.07	
Depressive Symptoms (4th Grade)	.67***	.59***	.05	.63	
Academic Self-Perception (4th Grade)	-.41***	-.96*	.48	-.11	.47***
Dependent Variable = Grade 6 CDI[b]					
Externalizing Symptoms (5th Grade)	-.002	-.43	.38	-.06	
Depressive Symptoms (5th Grade)	.55***	.75***	.08	.64	
Academic Self-Perception (5th Grade)	-.31***	.34	.74	.03	.38***
Dependent Variable = Grade 6 CDI[c]					
Externalizing Symptoms (4th Grade)	-.001	-.61	.40	-.08	
Depressive Symptoms (4th Grade)	.60***	.62***	.06	.59	
Academic Self-Perception (4th Grade)	-.31***	-.25	.59	-.03	.36***
Dependent Variable = Grade 5 CDI[d]					
Externalizing Symptoms (4th Grade)	.03	-.36	.32	-.05	
Depressive Symptoms (4th Grade)	.67***	.65***	.05	.67	
Social Self-Perception (4th Grade)	-.34***	-.58	.46	-.07	.48***
Dependent Variable = Grade 6 CDI[e]					
Externalizing Symptoms (5th Grade)	-.002	-.38	.38	-.05	
Depressive Symptoms (5th Grade)	.55***	.75***	.08	.63	
Social Self-Perception (5th Grade)	-.29***	.26	.61	.03	.38***
Dependent Variable = Grade 6 CDI[f]					
Externalizing Symptoms (4th Grade)	-.001	-.54	.39	-.07	
Depressive Symptoms (4th Grade)	.60	.59***	.06	.54	
Social Self-Perception (4th Grade)	-.39***	-1.40*	.57	-.15	.38***

Note: Gender and cohort served as control variables in all analyses. In addition, interactions with gender and with cohort were tested, but were nonsignificant.

[a] F= 66.35***, dF=(3, 225); [b] F=44.45***, dF=(3, 217); [c] F=41.25***, dF=(3, 221); [d] F=70.10***, dF=(3, 223); [e] F=44.22***, dF=(3, 218), [f] F=44.52***, dF=(3, 218); *p<.05 **p<.01 ***p<.001

Table 4—Results of Three Hierarchical Multiple Regression Analyses Predicting Changes in Children's Global Self-Worth from Prior Levels of Self-Reported Depressive Symptoms

Predictor Variable	r	B	SE B	Beta	R-square
Dependent Variable = Grade 5 Global Self-Worth[a]					
Externalizing Symptoms (4th Grade)	-.18**	-.06*	.03	-.12	
Global Self-Worth (4th Grade)	.43***	.23***	.07	.24	
Depressive Symptoms (4th Grade)	-.50***	-.02***	.01	-.28	.25***
Dependent Variable = Grade 6 Global Self-Worth[b]					
Externalizing Symptoms (5th Grade)	-.14*	-.03	.03	-.05	
Global Self-Worth (5th Grade)	.49***	.33***	.08	.30	
Depressive Symptoms (5th Grade)	-.50***	-.04***	.01	-.35	.33***
Dependent Variable = Grade 6 Global Self-Worth[c]					
Externalizing Symptoms (4th Grade)	-.05	.01	.04	.02	
Global Self-Worth (4th Grade)	.47***	.27***	.08	.24	
Depressive Symptoms (4th Grade)	-.52***	-.03***	.01	-.36	.30***

Note: Gender and cohort served as control variables in all analyses. In addition, interactions with gender and with cohort were tested, but were nonsignificant.

[a] F= 24.92***, dF=(3, 221); [b] F=35.63***, dF=(3, 216); [c] F=30.55***, dF=(3, 218)

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

Table 5—Results of Six Separate Hierarchical Multiple Regression Analyses Predicting Changes in Children's Self-Perceptions from Prior Levels of Self-Reported Depressive Symptoms

Predictor Variable	r	B	SE B	Beta	R-square
Dependent Variable = Grade 5 Academic Self-Perception[a]					
Externalizing Symptoms (4th Grade)	-.11	-.04	.04	-.06	
Academic Self-Perceptions (4th Grade)	.56***	.40***	.05	.46	
Depressive Symptoms (4th Grade)	-.44***	-.02***	.01	-.22	.36***
Dependent Variable = Grade 6 Academic Self-Perception[b]					
Externalizing Symptoms (5th Grade)	-.15*	-.05	.04	-.07	
Academic Self-Perceptions (5th Grade)	.59***	.50***	.07	.46	
Depressive Symptoms (5th Grade)	-.48***	-.03***	.01	-.22	.39***
Dependent Variable = Grade 6 Academic Self-Perception[c]					
Externalizing Symptoms (4th Grade)	-.07	-.01	.04	-.01	
Academic Self-Perception (4th Grade)	.45***	.32***	.06	.35	
Depressive Symptoms (4th Grade)	-.38***	-.02**	.01	-.20	.23***
Dependent Variable = Grade 5 Social Self-Perception[e]					
Externalizing Symptoms (4th Grade)	-.12	-.06	.04	-.08	
Social Self-Perception (4th Grade)	.49***	.37***	.06	.38	
Depressive Symptoms (4th Grade)	-.43***	-.02***	.01	-.23	.28***
Dependent Variable = Grade 6 Social Self-Perception[e]					
Externalizing Symptoms (5th Grade)	-.14*	-.04	.04	-.05	
Social Self-Perception (5th Grade)	.57***	.45***	.06	.45	
Depressive Symptoms (5th Grade)	-.46***	-.03***	.01	-.21	.35***
Dependent Variable = Grade 6 Social Self-Perception[f]					
Externalizing Symptoms (4th Grade)	-.08	-.01	.04	-.01	
Social Self-Perception (4th Grade)	.54***	.40***	.06	.43	
Depressive Symptoms (4th Grade)	-.47***	-.03***	.01	-.25	.34***

Note: Gender and cohort served as control variables in all analyses. In addition, interactions with gender and with cohort were tested, but were nonsignificant.

[a] F= 41.76***, dF=(3, 222); [b] F=46.56***, dF=(3, 216); [c] F=22.39***, dF=(3, 220); [d] F=29.36***, dF=(3, 221); [e] F=40.11***, dF=(3. 216); [f] F=37.00***, dF=(3, 215)

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

Table 6—Results of Six Hierarchical Multiple Regression Analyses Predicting Changes in Self-Reported Depressive Symptoms from Prior Levels of Cognitive Distortions

Predictor Variable	r	B	SE B	Beta	R-square
Dependent Variable = Grade 5 CDI[a]					
Externalizing Symptoms (4th Grade)	.03	.01	.35	.0001	
Depressive Symptoms (4th Grade)	.67***	.61***	.05	.64	
Academic Distortion (4th Grade)	-.37***	-.48	.29	-.09	.48***
Dependent Variable = Grade 6 CDI[b]					
Externalizing Symptoms (5th Grade)	-.002	-.43	.40	-.06	
Depressive Symptoms (5th Grade)	.55***	.79***	.08	.67	
Academic Distortion (5th Grade)	-.25***	.44	.37	.08	.39***
Dependent Variable = Grade 6 CDI[c]					
Externalizing Symptoms (4th Grade)	-.001	-.19	.43	-.02	
Depressive Symptoms (4th Grade)	.60***	.60***	.07	.58	
Academic Distortion (4th Grade)	-.31***	-.33	.36	-.06	.36***
Dependent Variable = Grade 5 CDI[d]					
Externalizing Symptoms (4th Grade)	.03	-.33	.33	-.05	
Depressive Symptoms (4th Grade)	.67***	.67***	.05	.69	
Social Distortion (4th Grade)	-.29***	-.32	.48	-.04	.48***
Dependent Variable = Grade 6 CDI[e]					
Externalizing Symptoms (5th Grade)	-.002	-.38	.40	-.05	
Depressive Symptoms (5th Grade)	.55***	.77***	.08	.65	
Social Distortion (5th Grade)	-.27***	.45	.68	.04	.39***
Dependent Variable = Grade 6 CDI[f]					
Externalizing Symptoms (4th Grade)	-.001	-.41	.40	-.06	
Depressive Symptoms (4th Grade)	.60***	.60***	.06	.56	
Social Distortion (4th Grade)	-.33***	-1.23*	.59	-.12	.37***

Note: Gender and cohort served as control variables in all analyses. In addition, interactions with gender and with cohort were tested, but were nonsignificant.

[a] F= 63.39***, dF=(3, 211); [b] F=45.18***, dF=(3, 206); [c] F=38.80***, dF=(3, 207), d F=69.35***, dF=(3, 223); [e] F=41.44***, dF=(3, 197); [f] F=43.63***, dF=(3, 218); *p<.05 **p<.01 ***p<.001

Table 7—Results of Six Hierarchical Multiple Regression Analyses Predicting Changes in Cognitive Distortions from Prior Levels of Self-Reported Depressive Symptoms

Predictor Variable	r	B	SE B	Beta	R-square
Dependent Variable = Grade 5 Academic Distortion[a]					
Externalizing Symptoms (4th Grade)	-.01	.01	.08	.01	
Academic Distortion (4th Grade)	.47***	.38***	.07	.38	
Depressive Symptoms (4th Grade)	-.38***	-.04**	.01	-.22	.26***
Dependent Variable = Grade 6 Academic Distortion[b]					
Externalizing Symptoms (5th Grade)	.06	.12	.08	.09	
Academic Distortion (5th Grade)	.48***	.37***	.07	.37	
Depressive Symptoms (5th Grade)	-.39***	-.05**	.02	-.24	.28***
Dependent Variable = Grade 6 Academic Distortion[c]					
Externalizing Symptoms (4th Grade)	.13	.17	.09	.12	
Academic Distortion (4th Grade)	.36***	.27***	.07	.27	
Depressive Symptoms (4th Grade)	-.29***	-.04**	.01	-.21	.17***
Dependent Variable = Grade 5 Social Distortion[d]					
Externalizing Symptoms (4th Grade)	.004	-.01	.05	-.02	
Social Distortion (4th Grade)	.40***	.32***	.07	.32	
Depressive Symptoms (4th Grade)	-.36***	-.02***	.01	-.23	.21***
Dependent Variable = Grade 6 Social Distortion[e]					
Externalizing Symptoms (5th Grade)	-.03	-.01	.05	-.01	
Social Distortion (5th Grade)	.40***	.28**	.09	.26	
Depressive Symptoms (5th Grade)	-.45***	-.03***	.01	-.30	.23***
Dependent Variable = Grade 6 Social Distortion[f]					
Externalizing Symptoms (4th Grade)	.11	.05	.05	.07	
Social Distortion (4th Grade)	.48***	.40***	.08	.39	
Depressive Symptoms (4th Grade)	-.38***	-.02**	.01	-.24	.28***

Note: Gender and cohort served as control variables in all analyses. In addition, interactions with gender and with cohort were tested, but were nonsignificant.

[a] F= 23.71***, dF=(3, 203); [b] F=24.42***, dF=(3, 183); [c] F=12.81***, dF=(3, 182); [d] F=17.27***, dF=(3, 197); [e] F=13.08***, dF=(3, 131); [f] F=19.09***, dF=(3, 146); *p<.05 **p<.01 ***p<.001