

What Ensues From Emotional Distress? Implications for Competence Estimation

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Although much is known about what precedes emotional distress, less is known about what follows such distress. The goal of this research was to examine the process by which emotional distress contributes to competence estimation. Children 9 to 13 years of age in fourth through sixth grade ($N = 932$) participated in a 3-wave longitudinal study spanning 12 months. Their emotional distress, views of themselves and their world, and competence estimation were assessed. Emotional distress predicted negative beliefs about the self and the world over time; these beliefs in turn predicted decrements in competence estimation over time. Negative views of the self and the world mediated the path from emotional distress to competence underestimation. The findings suggest that the experience of emotional distress has negative implications for children's development.

The question of what leads children to experience emotional distress, such as depression and anxiety, has guided a large body of theory and research over the last several decades. Therefore, much is known about the antecedents of emotional distress in children (for recent reviews, see Chorpita & Barlow, 1998; Garber & Hilsman, 1992; Hammen, 2000). Less empirical attention, however, has been given to the consequences of emotional distress in children (for exceptions, see Chen & Li, 2000; Cole, Peeke, Dolezal, Murray, & Canzoniero, 1999; Rudolph & Hammen, 1999). Moreover, although some consequences have been investigated, the processes by which they come about have not been well documented. This lack of knowledge is notable given that the consequences of emotional distress may account for why such distress endures in some children. The goal of the current research was to take a step toward identifying the processes by which emotional distress contributes to the development of one negative consequence—the tendency for children to

underestimate their competence relative to their performance.

Complementing the greater knowledge about the antecedents than the consequences of emotional distress, theory and research on competence estimation have focused more on consequences than on antecedents (e.g., Phillips, 1984; Phillips & Zimmerman, 1990). Thus, little is known about the emergence of individual differences in children's estimates of their competence relative to their performance (for exceptions, see Frome & Eccles, 1998; Phillips, 1987; Wagner & Phillips, 1992). Some prior research does indicate that over time, children experiencing emotional distress come to underestimate their competence relative to their performance (Cole, Martin, Peeke, Seroczynski, & Fier, 1999). Yet, the question of what underlies this process has not been answered. Addressing this question is of import because its answer may shed light not only on the consequences of emotional distress but also on how children's estimates of their competence develop. Elucidating this process may contribute to a transactional understanding of the persistence of emotional distress across the life span.

Emotional Distress and Views of the Self and the World

The current research drew from Lewinsohn and colleagues' (Rohde, Lewinsohn, & Seeley, 1990, 1994; Zeiss & Lewinsohn, 1988) idea that depressive episodes may leave a scar that fosters risk for future depression. This idea is consistent with transactional models of depression that emphasize the reciprocal

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relation between symptoms and children's functioning. For example, research suggests that depressive symptoms lead to several disruptions in children's lives, such as negative views of the self, problematic interpersonal relationships, and stressful life experiences (Kovacs, 1989; Kovacs & Goldston, 1991; Lara & Klein, 1999; Rao et al., 1995; Rudolph & Hammen, 1999). These developmental costs of emotional distress then put children at risk for further symptoms and lifetime difficulties (Kovacs, 1997).

The guiding proposal of the current research was that emotional distress, including depression and anxiety, leads children to view themselves and their surroundings in a manner that causes them to underestimate their competence relative to their performance. Specifically, it was anticipated that attributions for performance, feelings of uncertainty about how to meet standards for performance, and self-esteem all play a key role in the process by which emotional distress fosters the underestimation of competence relative to performance in children (see Figure 1).

Consistent with this proposal, there is a large body of research linking emotional distress to negative views of the self and the world (for recent reviews, see Bell-Dolan & Wessler, 1994; Chorpita & Barlow, 1998; Garber & Hilsman, 1992; Harter & Marold, 1994; Mathews & Macleod, 1994). Much research indicates that children experiencing depression attribute negative events in their lives to internal, stable, and global factors (e.g., "I did poorly on the math test because I am stupid") but attribute

positive events to external, unstable, and specific factors (e.g., "I did well on the math test because the teacher was in a good mood when she graded my test"; e.g., Hilsman & Garber, 1995; Nolen-Hoeksema, Girgus, & Seligman, 1986). Although the evidence is not consistent, it appears that children experiencing anxiety also possess such an attributional style (for a review, see Bell-Dolan & Wessler, 1994). Moreover, heightened depression and anxiety are associated with feeling uncertain about how to meet standards and with feeling that one has little control in general (e.g., Norwicki & Strickland, 1973; Weisz, Sweeney, Proffitt, & Carr, 1993). In addition, several studies have revealed, not surprising, that children suffering from depression have low self-esteem (e.g., Harter, Marold, & Whitesell, 1992; Renouf & Harter, 1990). Unfortunately, little of this research has focused on whether emotional distress is actually a developmental antecedent to negative views of the self and the world (for exceptions, see Harter & Marold, 1994; Nolen-Hoeksema et al., 1986, 1992).

However, research on adults in which momentary mood is manipulated can be informative in regards to this issue. Schwarz and Clore (1983, 1988, 1998) have argued that people often use their momentary mood as information in their judgments about themselves and their surroundings. In essence, people ask themselves how they feel and allow their answer to color their views. It has been proposed that mood is informative to people because it conveys information about their situation (e.g.,

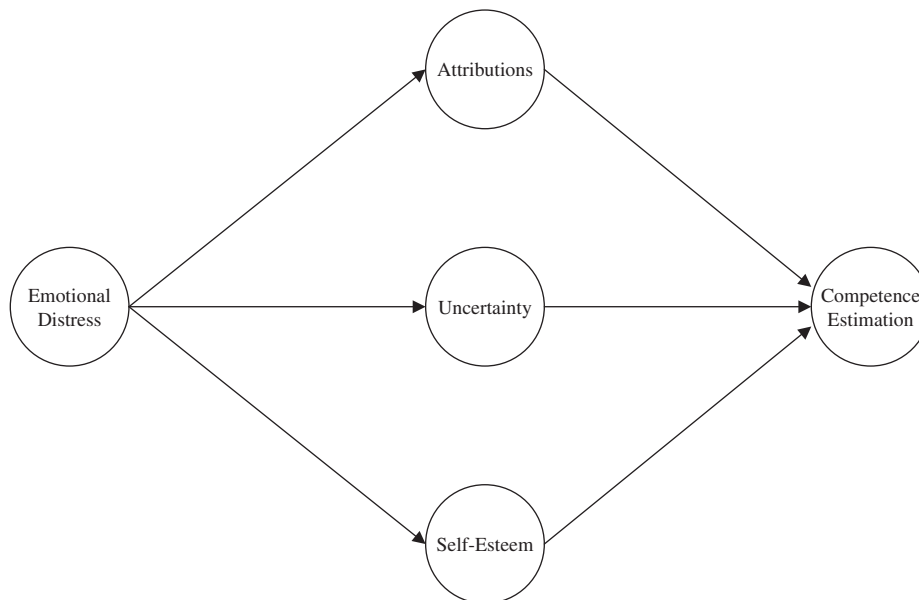


Figure 1. Proposed model.

Schwarz, 1990; Schwarz & Bless, 1991). Sad mood signals that something is wrong, which may be associated with feelings of uncertainty and uncontrollability that heighten the attention given to negative information about the self and the world (see Weary, Marsh, Gleicher, & Edwards, 1983). In line with this idea, research with adults demonstrates that being in a sad mood causes people to see themselves and their surroundings in a negative light (for a review, see Schwarz & Clore, 1998). For example, when college students are put into a depressed mood, they view their interactions with others negatively, particularly in regards to their own actions (Forgas, Bower, & Krantz, 1984). As a whole, the findings yielded by research on mood manipulation in adults support the proposal that emotional distress leads children to make negative attributions for performance, feel uncertain about how to meet standards for performance, and lack self-esteem.

Several other lines of research also point to the possibility that emotional distress leads children to see themselves and their surroundings negatively. Many studies suggest that adults experiencing depression are prone to ruminating over the negative aspects of their lives (e.g., Nolen-Hoeksema, Parker, & Larson, 1994) and have difficulty controlling such unconstructive thoughts (Wenzlaff, Wegner, & Roper, 1988). Similar results have been found for anxiety, as well as worrying, which is a major component of anxiety (Davey & Levy, 1998; Nolen-Hoeksema, 2000; Vasey & Borkovec, 1992). The rumination associated with emotional distress appears to lead adults to focus on negative aspects of themselves and their lives (Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998). It is possible that children experiencing emotional distress blame themselves for their failures and come to experience diminished self-worth. There also is evidence that children suffering from depression make their lives more difficult by generating stress (e.g., doing poorly in school, creating interpersonal conflicts) in their lives (e.g., Chen & Li, 2000; Rudolph & Hammen, 1999). Perhaps accurately, children experiencing emotional distress may blame themselves for this stress (see Rudolph et al., 2000). Moreover, children may come to feel that they are of little worth given that they have been responsible for trouble in their own and others' lives. To the extent that the stress is perceived as failure, children may feel uncertain as to how to go about meeting standards because they have been incapable of doing so in the past. Finally, research on adults shows that emotional distress is associated with heightened memory

for negative information (e.g., Watkins, Mathews, Williamson, & Fuller, 1992; for a review, see Mathews & Macleod, 1994). Emotional distress may increase the negative knowledge that children hold about themselves, causing them to view themselves and their surroundings in a negative light. In sum, although little research has directly examined the possibility that children's emotional distress shapes the way they see themselves and their surroundings, there is substantial evidence from experimental and correlational research suggesting this possibility.

Views of the Self and the World and Competence Estimation

Negative views of the self and the world resulting from emotional distress may lead children to underestimate their competence relative to their performance because such views color how they interpret evaluative feedback. When children view themselves and their surroundings in a negative manner, they may be more likely to see evaluative feedback as conveying that they lack competence, leading them to underestimate their competence. For example, the tendency of children experiencing emotional distress to blame their failure on internal, stable, and global causes but blame their success on external, unstable, and specific causes may lead children to view their failures but not their successes as relevant to their competence, thereby causing them to underestimate their competence relative to their performance (see Brown, 1998; Brown & Rogers, 1991; Robins & Beers, 2001). Consistent with this proposal, research has found that children who underestimate their competence attribute their success to their hard work instead of their ability (Phillips, 1984).

In addition, negative views of the self and the world may interfere with defensive processes, which provide protection against negative feedback. For example, when children low in self-esteem do poorly on an exam, they may not attempt to bolster their self-image by thinking about their other academic strengths; this lack of defensiveness may leave them feeling incompetent. In line with this suggestion, research on college students has found that those low in self-esteem are less likely than those high in self-esteem to engage in defensive processes when their self-worth has been threatened (e.g., Brown & Dutton, 1995; Dodgson & Wood, 1998).

When children view themselves and their surroundings in a negative light, they also may refrain from pursuing challenging tasks. Thus, children

vulnerable to emotional distress may rarely have the chance to experience success on something difficult. For example, children who feel uncertain about how to go about doing well in school may stay away from difficult tasks and focus on easy tasks; as a consequence, when they do well in school, they may simply attribute their success to the fact that they worked on easy tasks. Consistent with this idea, research indicates that children who perceive their abilities negatively tend not only to be uncertain about how to meet performance standards but also to avoid challenge (e.g., Gottfried, 1990; Pomerantz & Saxon, 2001). Moreover, Phillips (1984) has found that children who underestimate their competence relative to their performance set low standards for themselves. Although research points to the possibility that competence estimation is likely to emerge from negative views of the self and the world, the bulk of this research does not actually shed light on the direction of effect.

Overview of the Current Research

Several lines of theory and research suggest that emotional distress may cause children to develop views of themselves and their surroundings that lead them to underestimate their competence. The major goal of the current research was to examine this proposal directly. Specifically, the viability of the model depicted in Figure 1 was investigated. We studied children in fourth, fifth, and sixth grades. We focused on children of this age because prior theory and research suggest that this is a time of development during which particularly meaningful individual differences in children's competence estimation emerge. In the late elementary school years, children come to view ability as a stable capacity (e.g., Frey & Ruble, 1987; Nicholls, 1978; Pomerantz & Ruble, 1997; for a review, see Stipek & MacIver, 1989). Possibly as a consequence of such views, children's estimates of competence also become less uniformly positive at this time (e.g., Frey & Ruble, 1987; Nicholls, 1978; for a review, see Stipek & MacIver, 1989), continuing on this downward trajectory into the high school years (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). The late elementary school years may be a time of major divergences among children in their competence estimation, with some children setting off on a downward trajectory. Thus, it is important to identify the factors at this stage in children's life that shape how they estimate their competence.

Children took part in a three-wave longitudinal study spanning a 12-month period. It was important

to follow children over three waves so that the relations among the three central constructs (i.e., emotional distress, views of the self and the world, and competence estimates) of the proposed model could be examined as they unfold over time. At each of the three waves of the study, children reported on how they perceived their competence; these perceptions were compared with children's actual performance. This approach ensured that competence estimation was not simply a reflection of performance—often a problem in research on this issue (see Robins & Beers, 2001). Children's emotional distress (i.e., depressive and anxiety symptoms) and their views of themselves and their surroundings (i.e., attributions for performance, uncertainty about how to meet performance standards, and self-esteem) were also assessed with self-report measures. Testing the model depicted in Figure 1 was important because it has the potential not only to reveal what ensues from emotional distress but also to explain the development of individual differences in competence estimation. The longitudinal design of the research allowed for the investigation of reciprocal processes, thus providing a window into whether children's competence estimates play a role in maintaining their emotional distress over time.

The model depicted in Figure 1 was examined in both the academic and social domains in an effort to determine its generalizability. This approach also permitted the examination of an important issue with regard to gender differences. Cole, Martin, and colleagues (1999) found that the tendency of girls to estimate their academic competence relative to their performance more negatively than do boys is accounted for by the tendency of girls to experience more emotional distress than do boys. Although it is possible that this pattern may generalize to estimates of social competence, it is also possible that this may not be the case. Girls do not view their social competence more negatively than do boys (for a review, see Ruble, Gruelich, Pomerantz, & Gochberg, 1993), suggesting that there may be factors that protect girls from underestimating their social but not their academic competence.

Method

Participants

The data were collected as part of the University of Illinois Self-Evaluation Project (see Pomerantz, Altermatt, & Saxon, 2002; Pomerantz & Saxon, 2001; Pomerantz, Saxon, & Oishi, 2000). The sample consisted of 932 elementary school children (466

females, 466 males) attending two working- to middle-class school districts in the Midwest. There were 271 children in fourth grade (mean age = 10.25 years), 450 in fifth grade (mean age = 11.25 years), and 211 in sixth grade (mean age = 12.25 years). Children were primarily White (95%), with a few minorities (4% African Americans, 1% other). Letters describing the study were sent home to parents. Parents were asked to contact the school or investigators if they did not want their children to participate. Only 4% of parents did not allow their children to participate.

Procedure

Children took part in three waves of data collection 6 months apart from each other. The first wave took place during the spring, the second took place 6 months later the following fall, and the third took place 6 months later the following spring. The attrition rate was 11% (primarily because children moved out of the school district), yielding the sample described previously. The sample for each analysis varies because children sometimes failed to complete the majority of items for a measure included in the analysis. The measures described later were administered to children at all three waves. At each wave, children took part in two 45-min classroom administration sessions. A trained research assistant provided instructions for each measure, with particular emphasis on how to use

each rating scale. The research assistant read each item to children, and children marked their responses on their own.

Measures

Table 1 provides an overview of the measures, including the number of items, the potential range, the internal reliability, and the stability over the three waves. Table 2 provides the means and standard deviations.

Competence Estimation

Children's competence estimation was assessed by obtaining indicators of their perceptions of competence and their performance. Children's perceptions of competence were assessed in the academic and social domains using Harter's (1982) Perceived Competence Scale. Because of time constraints, only five of the six original items for each domain were used. Children were presented with descriptions of two types of children differing in their competence (e.g., "Some kids feel like they are just as smart as other kids their age, but other kids aren't so sure and wonder if they are as smart" and "Some kids find it's hard to make friends, but other kids find it's pretty easy to make friends"). Children then decided which child they were more like and indicated if it was really or sort of true for them. For each domain, the mean of the five items was used,

Table 1
Measure Characteristics

Measure	Number of items	Potential range	Internal reliability			Temporal stability		
			Wave 1	Wave 2	Wave 3	Wave 1 to 2	Wave 2 to 3	Wave 1 to 3
Competence estimation								
Academic	17 ^a		.80	.83	.80	.53	.64	.45
Social	27 ^b		.80	.82	.81	.45	.54	.35
Attributions								
Academic	24	0 to 1	.70	.73	.73	.54	.63	.48
Social	24	0 to 1	.64	.68	.73	.49	.54	.46
Uncertainty								
Academic	5	1 to 4	.86	.87	.89	.46	.58	.38
Social	5	1 to 4	.84	.88	.90	.40	.56	.35
Self-esteem	5	1 to 4	.80	.84	.82	.58	.62	.51
Emotional distress	45	1 to 4	.94	.94	.95	.68	.71	.57

Note. All correlations are significant ($p < .001$).

^aDuring seventh grade, the total number of items for the competence estimation index was 13 rather than 17 because children received grades in fewer subjects. ^bThe number of items for the assessment of peer acceptance varied by the number of classmates children had as each item was the rating made by a classmate. Thus, the number in the table for the social competence estimate represents the average number of classmates plus the five perceptions of competence items.

Table 2
Means and Standard Deviations as a Function of Gender and Wave

Measure	Wave 1		Wave 2		Wave 3	
	Females	Males	Females	Males	Females	Males
Competence estimation						
Academic ^a	-0.14(0.81)	0.14(0.79)	-0.10(0.84)	0.11(0.88)	-0.08(0.81)	0.08(0.92)
Social	-0.01(0.70)	0.01(0.70)	-0.03(0.65)	0.03(0.67)	-0.01(0.66)	0.01(0.64)
Attributions ^b						
Academic	0.64(0.14)	0.63(0.16)	0.66(0.16)	0.66(0.16)	0.66(0.17)	0.66(0.16)
Social ^a	0.76(0.14)	0.73(0.14)	0.77(0.14)	0.74(0.15)	0.76(0.15)	0.70(0.17)
Uncertainty ^b						
Academic	1.79(0.65)	1.76(0.71)	1.68(0.63)	1.55(0.63)	1.58(0.64)	1.56(0.70)
Social	1.66(0.66)	1.57(0.63)	1.56(0.67)	1.46(0.42)	1.48(0.65)	1.49(0.71)
Self-esteem ^a	3.11(0.72)	3.30(0.68)	3.19(0.69)	3.33(0.66)	3.21(0.66)	3.29(0.66)
Emotional distress ^a	1.97(0.50)	1.78(0.48)	1.86(0.51)	1.66(0.48)	1.82(0.54)	1.66(0.50)

Note. Standard deviations are in parentheses. The gender differences for self-esteem and emotional distress are also reported in Pomerantz et al. (2002).

^aSignificant ($p < .05$) gender difference. ^bSignificant ($p < .05$) domain difference.

with higher numbers indicating more positive perceptions of competence.

Children's performance in the academic domain was assessed by obtaining their grades in academic subjects: language arts, social studies, science, and math. Before reaching seventh grade, children received three grades in language arts—one for spelling, one for reading, and one for English—and one grade for each of the other three subjects, yielding a total of six grades. Beginning in seventh grade, children received only one grade in each of the four subjects, yielding a total of four grades. Children's letter grades were converted to numerical values (0 = F to 12 = A+). The mean of the grades in each of the subjects across the two academic quarters overlapping with each wave was employed as an index of academic performance for each wave. In the social domain, performance was assessed by the extent to which children were accepted by their peers. We employed a roster-and-rating sociometric procedure (Singleton & Asher, 1977). Children were provided with rosters of their classmates and were asked to rate how much they liked to play with each child. Following prior research (e.g., Parker & Asher, 1993; Singleton & Asher, 1977), children's acceptance was determined from the mean rating they received from classmates, standardized within classroom and gender.

The association between children's perceptions of competence and their performance ($r_s = .29$ to $.59$, $p_s < .001$) indicated that children's perceptions reflected their performance, but with some variability. Following Cole, Martin, and colleagues (1999),

individual residualized scores from the regression of children's self-perceptions onto their performance were used as an index of competence estimation. Regression analyses partialling children's performance from their self-perceptions were conducted, with separate analyses for the academic and social domains. The resulting standardized residualized scores served as indicators of competence estimation relative to performance in each domain. Negative numbers represent greater underestimation of competence relative to performance in the domain, whereas positive numbers represent greater overestimation of competence relative to performance in the domain. Although this procedure is commonly used for calculating competence estimates relative to performance, there is a built-in statistical bias toward treating high estimates as too high and low estimates as too low (see Cronbach & Furby, 1970).

Views of the Self and the World

Attributions. Children's attributional style was assessed with a modified version of Seligman, Kaslow, Tannenbaum, Alloy, and Abramson's (1984) Children's Attributional Style Questionnaire. Children were presented with hypothetical failures (e.g., "The teacher asks a question in class and you get it wrong" and "You are *not* invited to a birthday party for a kid in your class") and successes (e.g., "Your teacher asks a question in class and you get it right" and "You are invited to a birthday party for a kid in your class") in the academic and social domains. Each was followed by two attributions.

Children chose one as being the best. The attributions differed on three dimensions: (a) internality (e.g., "I am not good at this subject" vs. "The teacher usually asks difficult questions"), (b) stability (e.g., "I am usually pretty slow at finishing worksheets" vs. "That day I was pretty slow at finishing worksheets"), and (c) globality (e.g., "Most kids in my class have not been friendly lately" vs. "My friend has not been friendly lately"). For each pair of attributions, two dimensions were held constant and the third was varied. The three dimensions were evenly divided among the failures and successes within the academic and social domains. An index for children's attributions was computed by taking the mean across the 24 items spanning the three dimensions for children's attributions in each domain. Higher numbers represent a more positive attributional style—that is, more external, unstable, and specific attributions for failure and more internal, stable, and global attributions for success—in the domain.

Uncertainty. Children's uncertainty about how to meet academic and social standards was assessed by having children rate the extent to which they feel unsure about how to meet standards (e.g., "This year I am unsure about how to get good grades" and "This year I am unsure about how to make friends at school"). The mean of the five items for each domain was taken, with higher numbers indicating greater uncertainty regarding how to meet performance standards in the domain.

Self-esteem. Children's self-esteem was assessed with Harter's (1982) Global Self-Worth Scale (e.g., "Some kids are often unhappy with themselves, but other kids are pretty pleased with themselves"). Because of time constraints, only five of the six items were used. The mean was taken as an index of self-esteem, with higher numbers representing greater self-esteem.

Emotional Distress

Children's emotional distress was assessed with measures of depression and anxiety. Children's depressive symptoms were assessed with the Center for Epidemiological Studies Depression Inventory for Children (Weissman, Orvaschel, & Padian, 1980). For each of 20 items, children rated how often in the past week they had experienced depressive symptoms (e.g., "I felt down and unhappy this week" and "I was bothered by things that don't usually bother me"). Children's anxiety symptoms were assessed with the Revised Child Manifest Anxiety Scale (Reynolds & Richmond, 1978). Children rated how

often they experienced anxiety symptoms (e.g., "I get nervous when things do not go the right way," and "Often I have trouble getting my breath"). The original measure used a scale of 1 (*false*) and 2 (*true*). In an effort to increase the variance of anxiety symptoms, we employed a 4-point scale. We eliminated 3 of the original 28 items because they were redundant with items on the depression scale. The means for each of the two scales were computed and averaged to create an index of emotional distress, with higher numbers representing greater distress.

Results

Associations Among the Constructs

The key relations among the constructs were investigated concurrently and longitudinally by conducting bivariate correlations within each wave and across each wave (see Table 3). Consistent with prior research, emotional distress was significantly associated with competence estimation concurrently and longitudinally. Moreover, children's views of themselves and their surroundings (i.e., attributions for performance, uncertainty about how to meet performance standards, and self-esteem) were associated with emotional distress as well as with competence estimation, again both concurrently and longitudinally. Analyses adjusting for children's gender and age (i.e., grade in school) indicated that the relations were not due to these factors. To examine the proposed model, two subsequent sets of analyses were performed. Simultaneous multiple regression (SMR) analyses were conducted to identify the direction of effects. Once the direction of effects was determined, structural equation modeling (SEM) was used to investigate the mediational pathways.

Direction of Effects: SMR

SMR analyses were conducted to examine the extent to which one construct (e.g., emotional distress) predicted another (e.g., competence estimation) over time (e.g., from Wave 1 to Wave 2), adjusting for the predicted construct (e.g., competence estimation) at the earlier time point (e.g., Wave 1). Each relation was examined over each of the three periods: Wave 1 to 2, Wave 2 to 3, and Wave 1 to 3. Thus, for each relation, there were three sets of analyses. Because the stability over time of the constructs to be predicted was substantial (see Table 1), it was essential to adjust for the construct

Table 3
Intercorrelations

Measure	Wave 1					Wave 2					Wave 3				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Wave 1															
1. Competence estimation	.32	.36	-.50	.48	-.44	.45	.22	-.28	.32	-.28	.35	.20	-.23	.29	-.22
2. Attributions	.38	.37	-.38	.36	-.38	.31	.49	-.24	.33	-.31	.28	.46	-.21	.32	-.28
3. Uncertainty	-.41	-.50	.55	-.42	.56	-.33	-.28	.40	-.35	.39	-.30	-.30	.35	-.30	.32
4. Self-esteem	.37	.34	-.38	—	-.58	.32	.28	-.29	.58	-.43	.26	.24	-.22	.51	-.34
5. Emotional distress	-.39	-.38	.53	-.58	—	-.37	-.30	.44	-.51	.68	-.31	-.28	.39	-.44	.57
Wave 2															
1. Competence estimation	.53	.39	-.34	.28	-.33	.37	.35	-.47	.55	-.45	.54	.24	-.35	.40	-.35
2. Attributions	.28	.54	-.33	.26	-.31	.44	.41	-.32	.37	-.36	.26	.54	-.28	.34	-.28
3. Uncertainty	-.26	-.33	.46	-.35	.48	-.42	-.42	.66	-.43	.59	-.39	-.28	.55	-.37	.50
4. Self-esteem	.30	.26	-.34	.59	-.51	.47	.39	-.49	—	-.59	.33	.25	-.31	.62	-.45
5. Emotional distress	-.29	-.31	.38	-.43	.68	-.43	-.38	.61	-.59	—	-.40	-.34	.49	-.48	.71
Wave 3															
1. Competence estimation	.45	.40	-.31	.26	-.32	.64	.40	-.34	.33	-.38	.38	.34	-.43	.50	-.41
2. Attributions	.24	.48	-.29	.21	-.25	.32	.63	-.38	.31	-.36	.44	.49	-.36	.40	-.40
3. Uncertainty	-.19	-.28	.38	-.28	.40	-.28	-.34	.58	-.36	.51	-.40	-.47	.70	-.41	.61
4. Self-esteem	.24	.31	-.28	.51	-.44	.32	.33	-.38	.62	-.48	.46	.39	-.41	—	-.53
5. Emotional distress	-.26	-.29	.33	-.34	.57	-.35	-.30	.51	-.45	.71	-.44	-.40	.60	-.53	—

Note. Correlations in the bottom triangle are within the academic domain; correlations in the upper triangle are within the social domain; correlations along the diagonal are between the academic and social domains. All correlations are significant ($p < .001$)

being predicted at the prior wave. This conservative approach ensured that a significant effect reflected a true effect over time rather than simply a concurrent association. However, given the high stability of the measures, this approach also produced small effects. Analyses examining the reverse direction of influence to that hypothesized also were conducted for each set of links over time.

Emotional distress and competence estimation. We began by examining the extent to which emotional distress predicted competence estimation over time, adjusting for earlier competence estimation. As shown in Table 4, consistent with prior research (Cole, Martin, et al., 1999), emotional distress significantly predicted lower competence estimation in the academic domain over all three periods, β s = $-.13$ to $-.17$, $ts > 4.45$, $ps < .001$. An identical pattern was evident for competence estimation in the social domain over all three periods, β s = $-.19$ to $-.22$, $ts > 5.30$, $ps < .001$.

Analyses examining the opposite direction of effects provided little evidence that competence estimation predicted emotional distress over time. In the academic domain, competence estimation significantly predicted emotional distress, $\beta = -.06$, $t(793) = 2.26$, $p < .05$, but only from Wave 2 to 3. In the social domain, competence estimation never predicted emotional distress, $|\beta|s < .05$, $ts < 1.60$,

ns. In line with prior research (Cole, Martin, et al., 1999), the one significant relation was smaller than the more consistent significant relations in the reverse direction (mean $\beta = -.16$).

Emotional distress and views of the self and the world. We next examined the extent to which emotional distress predicted views of the self and the world (i.e., attributions for performance, uncertainty about meeting performance standards, and self-esteem) over time. Consistent with prior research (e.g., Nolen-Hoeksema et al., 1986), emotional distress significantly predicted less positive attributions in the academic domain from Wave 1 to 2 and Wave 2 to 3 (see Table 4), β s = $-.12$ and $-.15$, $ts > 3.90$, $ps < .001$. In the social domain, emotional distress significantly predicted less positive attributions over all three periods, β s = $-.13$ to $-.15$, $ts > 3.65$, $ps < .001$. As anticipated, over all three periods, emotional distress significantly predicted heightened uncertainty in the academic domain, β s = $.25$ to $.33$, $ts > 6.90$, $ps < .001$, and in the social domain, β s = $.25$ to $.32$, $ts > 7.15$, $ps < .001$. In addition, consistent with predictions, emotional distress predicted low self-esteem over all three periods, β s = $-.17$ to $-.26$, $ts > 5.05$, $ps < .001$.

Analyses were conducted to examine the extent to which views of the self and the world predicted emotional distress over time. In general, in both the

Table 4
Emotional Distress as a Predictor of Competence Estimation and Views of the Self and the World Over Time

Dependent variable	Domain											
	Academic						Social					
	Wave 1 to 2		Wave 2 to 3		Wave 1 to 3		Wave 1 to 2		Wave 2 to 3		Wave 1 to 3	
	β	t	β	t	β	t	β	t	β	t	β	t
Competence estimation	-.16	4.93***	-.13	4.47***	-.17	4.96***	-.22	6.79***	-.20	6.24***	-.19	5.32***
Attributions	-.12	3.94***	-.15	4.92***	-.06	1.86	-.14	4.33***	-.15	4.58***	-.13	3.68***
Uncertainty	.33	9.81***	.25	6.95***	.28	7.48***	.32	8.75***	.25	7.18***	.29	7.76***
Self-esteem ^a	-.26	8.23***	-.17	5.06***	-.23	6.50***						

Note: All analyses adjust for the dependent variable at the earlier wave.

^aSelf-esteem was a global measure and was not measured specifically in the academic or social domain.

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

Table 5
Predicting Competence Estimation Over Time from Views of Self and the World

Independent variable	Domain											
	Academic						Social					
	Wave 1 to 2		Wave 2 to 3		Wave 1 to 3		Wave 1 to 2		Wave 2 to 3		Wave 1 to 3	
	β	t	β	t	β	t	β	t	β	t	β	t
Attributions	.22	6.98***	.15	4.75***	.27	7.94***	.19	5.67***	.08	2.43*	.18	5.29***
Uncertainty	-.15	4.46***	-.09	2.92**	-.16	4.62***	-.15	4.16***	-.16	4.89***	-.16	4.38***
Self-esteem	.10	2.93**	.04	1.39	.10	2.96**	.13	3.82***	.04	1.12	.11	2.99**

Note: All analyses adjust for the competence estimation at the earlier wave.

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

academic and social domains, negative attributions for performance and uncertainty about meeting performance standards significantly predicted heightened emotional distress over time, $|\beta|s = .06$ to $.12$, $ts > 2.30$, $ps < .05$, although these significant relations (mean $|\beta| = .09$) were weaker than those in the reverse direction (mean $|\beta| = .22$). Moreover, the relations were less consistent, as they were not evident for attributions from Wave 2 to 3, $|\beta|s < .05$, $ts > 1.50$, ns , or for uncertainty from Wave 1 to 2 or 3, $|\beta|s < .04$, $ts > 1.05$, ns . Self-esteem never predicted emotional distress over time, $|\beta|s < .07$, $ts > 1.95$, ns .

Views of the self and the world and competence estimation. To what extent do views of the self and the world predict competence estimation over time? As shown in Table 5, consistent with expectations, in the academic domain, positive attributions for performance predicted higher competence estimation over all three periods, $\beta s = .15$ to $.27$, $ts > 4.70$, $ps < .001$. A similar pattern was evident in the social domain, $\beta s = .08$ to $.19$, $ts > 2.40$, $ps < .05$. In addition,

across all three periods, uncertainty about how to meet performance standards predicted lower competence estimation in the academic domain, $\beta s = -.09$ to $-.16$, $ts > 2.90$, $ps < .01$, as well as in the social domain, $\beta s = -.15$ to $-.16$, $ts > 4.15$, $ps < .001$. Self-esteem also predicted competence estimation in the academic domain from Wave 1 to 2 and 3, $\beta s = .10$, $ts > 2.90$, $ps < .01$. Self-esteem predicted competence in the social domain as well, $\beta s = .11$ and $.13$, $ts > 2.95$, $ps < .01$, but again only from Wave 1 to 2 and 3.

Analyses examining these relations in the reverse direction provided inconsistent evidence. The only time competence estimation significantly predicted positive attributions for performance was from Wave 1 to 2 in the academic domain, $\beta = .07$, $t(729) = 2.20$, $p < .05$. Competence estimation significantly predicted low uncertainty about meeting performance standards in the academic domain only from Wave 1 to 2, $\beta = -.11$, $t(776) = 3.22$, $p < .01$, but over all three periods in the social domain, $\beta s = -.08$

to $-.13$, $ts > 2.25$, $ps < .05$. Competence estimation in the academic domain significantly predicted self-esteem only from Wave 1 to 2, $\beta = .10$, $t(793) = 3.16$, $p < .01$, and competence estimation in the social domain significantly predicted self-esteem only from Wave 1 to 2 and from Wave 2 to 3, $\beta s = .06$ and $.09$, $ts > 1.95$, $ps < .05$. These significant relations (mean $|\beta| = .09$) were weaker than the more consistent significant relations in the reverse direction (mean $|\beta| = .18$).

Summary. Overall, the data supported the proposed model (see Figure 1). Consistent with prior research, emotional distress predicted lower competence estimation over time, adjusting for prior competence estimation. As anticipated, emotional distress also predicted less positive attributions for performance, heightened uncertainty about meeting performance standards, and lower self-esteem over time, which in turn predicted lower competence estimation over time. This pattern was equally evident in the academic and social domains. The links appeared to be reciprocal, but the relations going in the other direction were less consistent and weaker. Although the pattern of findings suggests that the link between emotional distress and competence estimation is mediated by views of the self and the world, the analyses did not examine this issue directly. That was the goal of the next set of analyses.

Mediation Pathways: SEM

To examine mediation directly, we used SEM. We followed Baron and Kenny's (1986; see also Kenny, Kashy, & Bolger, 1998) guidelines for detecting mediation. Baron and Kenny outlined three requirements for mediation. First, there must be a relation between the independent variable (i.e., emotional distress) and the mediator variable (i.e., attributions for performance, uncertainty about how to meet performance standards, and self-esteem). This requirement has already been met as indicated by the analyses examining the links between emotional distress and the views of the self and the world (see Tables 3 and 4). Second, the mediator variable and the dependent variable (i.e., competence estimation) must be related when analyses adjust for the independent variable. Third, for full mediation, the direct relation between the independent variable and the dependent variable must be reduced to nonsignificance once analyses adjust for the mediator variable. Moreover, when using SEM, mediation is evident if the model including the direct path between the independent and dependent variables

does not fit the model significantly better than the model excluding the path. Most important, we also used Clogg, Petkova, and Haritou's (1995) procedures for determining the significance of mediation. We compared the coefficients for the direct paths in the context of the models including and excluding the mediators.

In addition to permitting us to examine the mediational pathways, SEM allowed us to investigate the extent to which the proposed model (see Figure 1) fit the data, taking into account measurement error to obtain more accurate estimates of the relations. A key goal of the SEM analyses was to test the proposed model with particular attention to the mediational pathways. We wanted to keep the tested model as parsimonious as possible. Given that we already established the direction of effects in the SMR analyses, we did not adjust for every endogenous construct at earlier waves. Doing so not only would unnecessarily complicate the model but also would provide an inflated fit of the model driven by the high stability of the constructs over time. We did, however, feel that it was important to adjust for the major endogenous construct—competence estimation—because of our interest in the pathways by which emotional distress influenced this construct over time.

We used Amos Version 3.6 (Arbuckle, 1997) to conduct the SEM analyses. As shown in Figures 2 and 3, the latent construct of emotional distress at Wave 1 included depressive and anxiety symptoms. This latent construct was set to predict the latent constructs of attributions for performance, uncertainty about meeting performance standards, and self-esteem at Wave 2. The latent construct of attributions for performance was based on attributions for success and attributions for failure; the latent construct for uncertainty about meeting performance standards was based on two subscales, one composed of two of the uncertainty items and the other composed of three of the uncertainty items; and the latent construct for self-esteem also was based on two subscales, one composed of two of the self-esteem items and the other composed of three of the self-esteem items. Given that these three constructs were associated (see Table 3), their errors were allowed to correlate. Attributions for performance, uncertainty about how to meet performance standards, and self-esteem at Wave 2 were all set to predict competence estimation at Wave 3. The model adjusted for competence estimation at Wave 1, which was set to covary with emotional distress at Wave 1. Separate models were estimated for the academic and social domains.

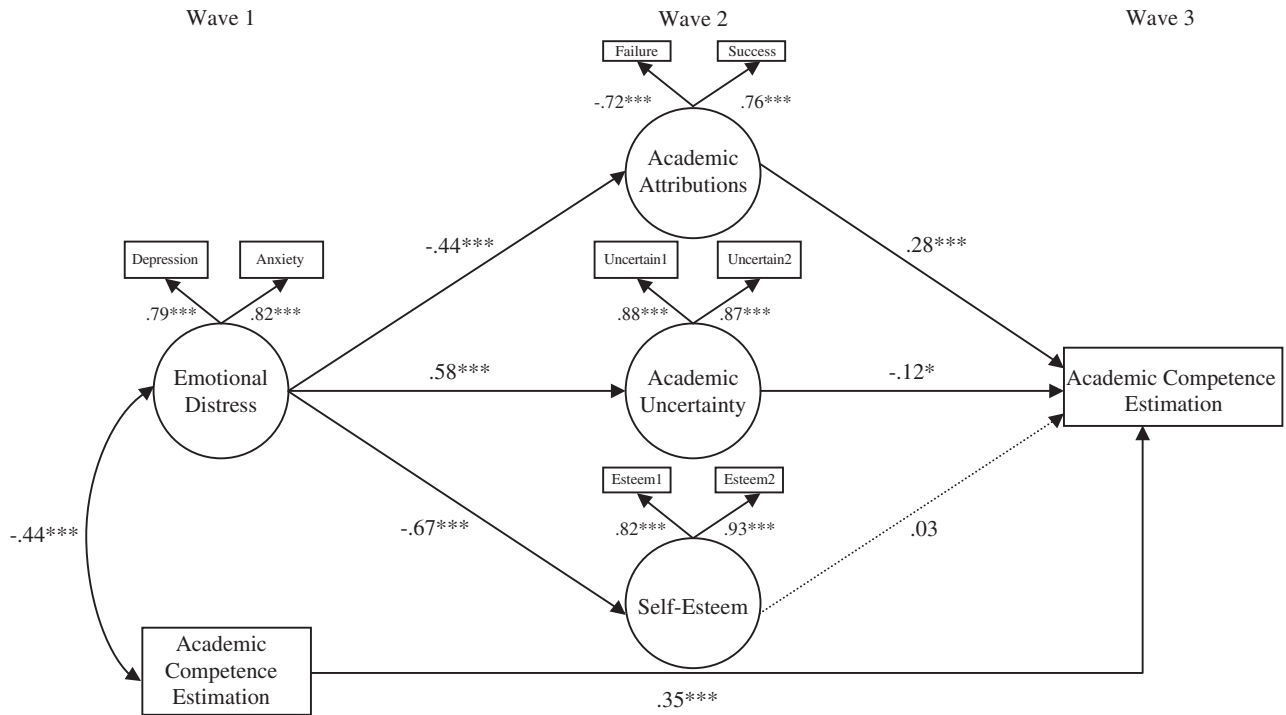


Figure 2. Structural equation model for the academic domain. * $p < .05$. ** $p < .01$. *** $p < .001$.

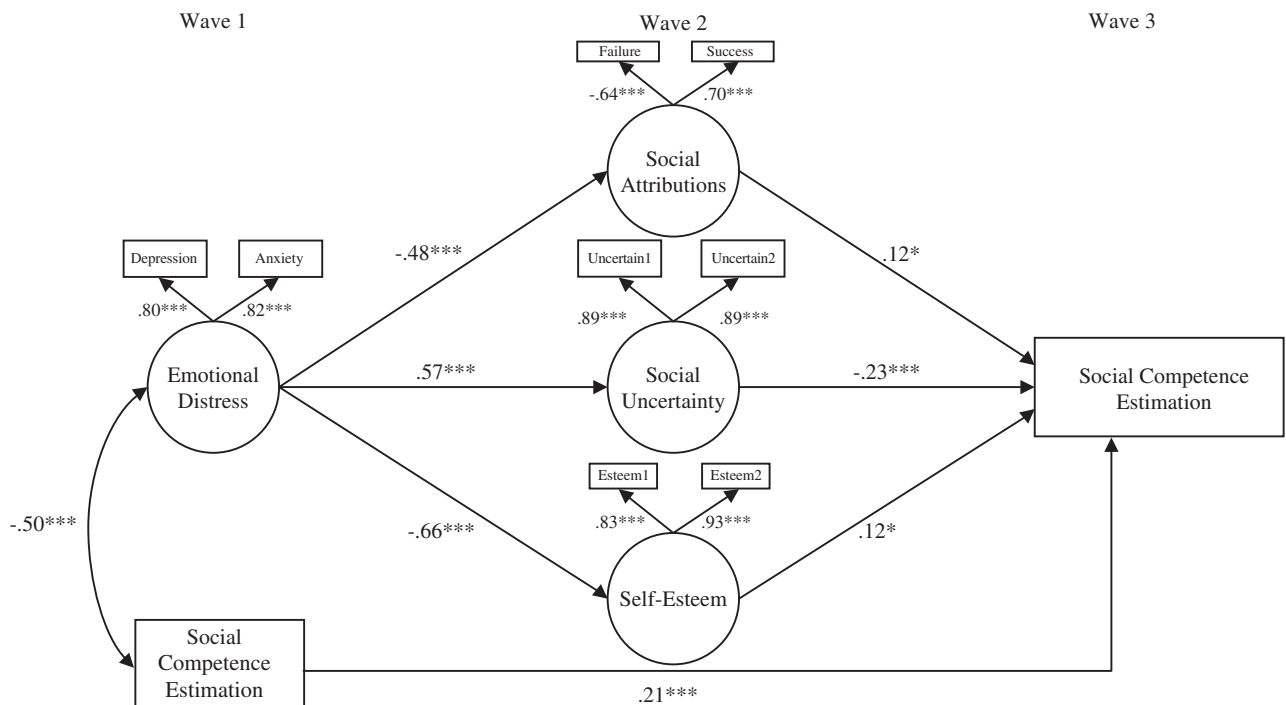


Figure 3. Structural equation model for the social domain. * $p < .05$. ** $p < .01$. *** $p < .001$.

The model for the academic domain fit well, $\chi^2(26, N = 642) = 69.92, p < .001, CFI = .98, TLI = .97, IFI = .98, RMSEA = .05$. As shown in Figure 2,

consistent with expectations and the prior analyses, emotional distress significantly predicted less positive attributions, increased uncertainty about how to

meet performance standards, and reduced self-esteem over time. However, only positive attributions for performance and uncertainty about how to meet performance standards were significantly associated with competence estimation over time. As evidence of mediation, the model including the direct effect between emotional distress at Wave 1 and competence estimation at Wave 3 did not yield a significantly better fit than the model without the direct effect, $\chi^2_{\text{diff}}(1, N = 642) < 1$, although the links between the views of the self and the world and competence estimation remained significant. Moreover, once the three views of the self and the world were taken into account, the link between emotional distress and competence estimation was reduced to near zero, $\gamma = -.04$. Notably, this reduction was significant, $t(635) = 4.86$, $p < .001$, indicating that views of the self and the world underlie the process by which emotional distress may dampen competence estimates in the academic domain.

The model for the social domain also fit well, $\chi^2(26, N = 663) = 55.34$, $p < .001$, CFI = .99, TLI = .98, IFI = .99, RMSEA = .04. As shown in Figure 3, consistent with expectations and the prior analyses, emotional distress significantly predicted less positive attributions, increased uncertainty about how to meet performance standards, and reduced self-esteem over time. Moreover, all three were significantly associated with competence estimation over time. The model including the direct effect between emotional distress at Wave 1 and competence estimation at Wave 3 did not yield a significantly better fit than the model without the direct effect, $\chi^2_{\text{diff}}(1, N = 642) < 1$, although the links between the views of the self and the world and competence estimation remained significant. Once the three views of the self and the world were taken into account, the link between emotional distress and competence estimation was reduced to zero, $\gamma = .00$, *ns*. This reduction was significant, $t(635) = 7.02$, $p < .001$. Thus, it appears that views of the self and the world also underlie the process by which emotional distress may dampen competence estimates in the social domain.

Gender Differences

We conducted a final set of analyses concerned with the role of gender. We first examined whether there were gender differences in children's competence estimates and whether these differences varied as a function of the domain in which the estimates were made. To this end, we conducted a Gender (female, male) \times Domain (academic, social) \times Wave

(Wave 1, Wave 2, Wave 3) mixed-model MANOVA on children's competence estimates. All multivariate effects were evaluated using Wilks's lambda. Consistent with prior research (for a review, see Ruble et al., 1993), there was a significant effect of gender, $F(1, 705) = 14.44$, $p < .001$, which was moderated by a significant Gender \times Domain interaction, $F(1, 705) = 13.50$, $p < .001$. As shown in Table 2, in line with prior research, females were significantly more likely than males to underestimate their competence in the academic domain, $t(1, 705) = 4.02$, $p < .001$, but not in the social domain, $t(1, 705) < 1$.

We next examined whether any of the proposed links differed as function of children's gender, by comparing the fit of the models in Figures 2 and 3 for girls and boys. In both the academic and social domains, the model fit for girls and boys equally well. For each domain, the model where the parameters were estimated to vary freely was not significantly different from the model where the parameters were constrained to be equal, $\chi^2_{\text{sdiff}}(17, N = 642) < 29$, *ns*.

Discussion

Although much attention has been directed toward understanding the origins of children's emotional distress, less is known about what ensues once children experience such distress. The focus of the current research was on the implications of children's emotional distress for their subsequent development. Of particular interest were the processes by which such distress may contribute to children's estimates of their competence. Consistent with transactional models suggesting that emotional distress disrupts children's functioning, thereby fostering further emotional distress (Kovacs, 1989, 1997; Rao et al., 1995; Rohde et al., 1990, 1994; Rudolph & Hammen, 1999; Zeiss & Lewinsohn, 1988), the findings of the current research indicate that children experiencing emotional distress—depressive and anxiety symptoms—come to see themselves and their surroundings in a negative light. These negative views, in turn, are followed by children underestimating their competence relative to their performance. Notably, this sequence of events was evident in both the academic and social domains.

These findings are important as they suggest that emotional distress is problematic for development not only because it is a negative emotional experience by itself but also because it may be followed by negative views of the self and the world that predict underestimation of competence over time. The

underestimation of competence may have additional negative implications for children's development. Indeed, it has been shown to be predictive of negative outcomes such as poor achievement (e.g., Lopez, Little, Oettingen, & Baltes, 1998). The tendency for children's emotional distress to be followed by decrements in competence estimation may be part of a dynamic system in which competence estimation and its consequences create additional vulnerability to emotional distress under certain conditions.

Emotional Distress and Views of the Self and the World

It was anticipated that children's experience of emotional distress would put them at risk for seeing themselves and their surroundings in a negative light. In line with this idea, over time, emotional distress predicted heightened internal, stable, and global attributions for failure as well as heightened external, unstable, and specific attributions for success, even when analyses adjusted for prior attributions. Similarly, emotional distress was associated over time with heightened feelings of uncertainty about how to meet standards for performance; once again, this relation held even when analyses adjusted for prior feelings of uncertainty. Moreover, emotional distress predicted decrements in self-esteem over time, adjusting for prior self-esteem.

Future research will need to address what underlies the tendency for children experiencing emotional distress to subsequently see themselves and their surroundings in a negative light. First, it is not clear whether it is the presence of negative emotions or the absence of positive emotions associated with emotional distress that produces negative beliefs. Although Lewinsohn's scar theory focuses on the negative consequences of depression, Fredrickson (1998), in her broaden-and-build model of positive emotions, suggests that the experience of positive emotions has positive consequences. Second, the question of how emotional distress fosters negative views of the self and the world needs to be directly investigated. We have proposed several possible mechanisms, including negative self-focused attention and memory, ruminative processes, and the generation of stress. Most likely, it is some combination of these processes that underlies the pathway from emotional distress to seeing oneself and one's surroundings negatively, but it will be important for future research to investigate this.

There also was evidence that the negative views of the self and the world following from emotional

distress may put children at risk for further emotional distress. However, the evidence for this sequence of events was not entirely consistent, with the links often being quite weak. This inconsistency may reflect a tendency for such views to foster emotional distress among children under a limited set of conditions. First, much of the work on negative views of the self and the world as antecedents to emotional distress has highlighted that such views create a risk mainly when negative life events are experienced (e.g., Abramson, Metalsky, & Alloy, 1989; Garber & Hilsman, 1992). Second, it is possible that in the elementary school years, emotional distress emerges primarily from factors other than negative beliefs, such as stressful life events or biological mechanisms. This possibility is consistent with evidence that views of the self and the world may be weaker vulnerability factors in younger than in older children (e.g., Nolen-Hoeksema et al., 1992; Turner & Cole, 1994). It may be that views of the self and the world are less solidified in younger than in older children. Third, emotional distress was more stable over time than views of the self and the world (see Table 1), suggesting that the late elementary school years may be less of a time of change for the former than for the latter. At times of change in emotional distress, views of the self and the world may be more influential. Fourth, in an attempt to understand why there is a reciprocal relation between self-esteem and depression, Harter and colleagues (Harter & Marold, 1994; Harter & Whitesell, 1996) suggest that there may be different relations for different children. For some children, low self-esteem may lead to emotional distress, whereas for others emotional distress may put them at risk for low self-esteem. It will be important for future research to identify when and for which children views of the self and the world contribute to the onset or maintenance of emotional distress.

Views of Self and the World and Competence Estimation

Consistent with prior research (Cole, Martin, et al., 1999), emotional distress not only predicted negative views of the self and the world but also the underestimation of competence over time. Notably, as anticipated (see Figure 1), the link over time between emotional distress and competence estimation was mediated by how children saw themselves and their surroundings. Specifically, negative attributions for performance and feelings of uncertainty about how to meet performance standards not only predicted underestimation of competence over time but also accounted for the link between emotional

distress and estimates of competence. The low self-esteem associated with emotional distress also played a role in the development of low estimates of competence, mediating the link between emotional distress and competence underestimation, but only in the social domain. The findings linking negative views of the self and the world to competence estimation over time and showing that such views underlie the link between emotional distress and competence estimation are important because they elucidate the processes through which emotional distress may foster competence underestimation. However, more work is needed regarding the mechanisms by which children's beliefs about themselves and their surroundings lead them to underestimate their competence. Earlier, we suggested several possible pathways based on prior theory and research. In particular, the negative views of the self and the world that result from emotional distress may color how people interpret evaluative feedback, interfere with defensive processes, and cause people to refrain from pursuing challenging tasks. Each of these consequences may then result in the underestimation of competence. A fruitful direction for future research will be to elaborate on these and other pathways.

Gender Differences

A large body of research has documented that females experience more emotional distress than do males (for reviews, see Feingold, 1994; Nolen-Hoeksema, 1987, 1990). This gender difference is paralleled by a tendency for females to underestimate their competence relative to their performance more than do males in the academic domain (for a review, see Ruble et al., 1993). Recent research conducted by Cole, Martin, and colleagues (1999) suggests that the gender difference in competence estimation in the academic domain is due to females' heightened vulnerability to emotional distress. In the current research, we examined whether the gender difference in emotional distress also is paralleled by a tendency for females to underestimate their competence in the social domain. This did not appear to be the case. Consistent with prior research (see Ruble et al., 1993, for a review), although females were more vulnerable to emotional distress than were males, females did not underestimate their competence in the social domain any more than did males (see Table 2).

Why is it that the gender difference in emotional distress is paralleled by a gender difference in estimations of academic but not social competence?

Although this is clearly a question for future research, there are several possibilities suggested by prior theory and research. Investigators have suggested that females are more invested than are males in interpersonal relationships (see Cross & Madson, 1997; Hoffman, 1972; Rudolph & Conley, 2002). As a consequence, females may seek out more enhancing information in this domain than in the academic domain. Indeed, investment has been found to predict positive self-perceptions over time (Pomerantz et al., 2000) and to be associated with preferences for enhancing evaluative feedback (Trope & Pomerantz, 1998). Females also may be more communicative with one another in their interpersonal relations. Parker and Asher (1993) found that during the elementary school years, girls' relationships are more likely than those of boys to be characterized by high levels of validation and intimate exchange. As a consequence, girls may receive more feedback that they are good friends than do boys. Finally, females may use culturally held gender stereotypes in estimating their competence (see Eccles, 1984; Lenney, 1977). In the social domain, the stereotype is that females are more skilled than are males. All of these factors may work to enhance females' estimates of competence in the social domain and buffer them against the detrimental effects of emotional distress.

Conclusions

The current research adds to a growing body of work indicating that emotional distress may have significant costs for the views children develop about themselves and their world. These views in turn may contribute to the persistence of children's emotional distress under some conditions. The findings of the current research are important because they go beyond prior research that simply documents what ensues from emotional distress to specifying the processes involved. It appears that emotional distress negatively shapes how children see themselves and their surroundings, which is followed by children underestimating their competence relative to their performance.

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