

A Test of the Integration of the Hopelessness and Response Styles Theories of Depression in Middle Adolescence

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The current study examined several theories of depression in a sample of middle adolescents. At Time 1, 367 ninth graders completed measures assessing depressogenic inferential styles, the tendency to ruminate in response to depressed mood, and depressive symptoms. Six weeks later, participants completed measures assessing negative events and depressive symptoms. In line with the hopelessness theory, a depressogenic weakest link interacted with negative events to predict increases in hopelessness depression symptoms but not in more general depressive symptoms. Further, providing partial support for the response styles theory, the tendency to ruminate in response to depressed mood predicted increases in hopelessness depression symptoms but not in more general depressive symptoms. Contrary to the integrative theory, the relationship between a depressogenic weakest link and increases in hopelessness depression symptoms following negative events was not moderated by a ruminative response style.

Middle adolescence represents a critical developmental period with respect to understanding the development of depression as rates of depression begin to increase dramatically during this period of time (Hankin et al., 1998). In addition, sex differences in depression that begin to emerge during early adolescence intensify during this time, as girls become twice as likely as boys to develop depression (Lewinsohn, Clarke, Seeley, & Rohde, 1994). Thus, middle adolescence represents a critical time with respect to understanding the factors underlying the etiology of depression.

One theory of vulnerability to depression that has obtained promising results in research with adults is the hopelessness theory (Abramson, Metalsky, & Alloy, 1989). The hopelessness theory posits three distinct depressogenic inferential styles that serve as distal contributory causes of depression: (a) the tendency to attribute negative events to global and stable causes, (b) the tendency to catastrophize the consequences of negative events, and (c) the tendency to view the self as deficient following negative events. Each of these styles predis-

poses individuals to depression by increasing the likelihood that they make depressogenic inferences following negative events. Making such inferences increases the likelihood that hopelessness develops. Once hopelessness develops, depression is inevitable as the theory views hopelessness as a proximal sufficient cause of depression.

Research provides mixed support for the applicability of the vulnerability-stress hypothesis of the hopelessness theory to adolescents. Although the results from some prospective studies have provided full support for this hypothesis (e.g., Hankin, Abramson, & Siller, 2001), other studies have provided only partial (e.g., Abela, 2001; Abela & Seligman, 2000; Lewinsohn, Joiner, & Rohde, 2001) or no support (Abela & Sarin, 2002; Spence, Sheffield, & Donovan, 2002). In response to such mixed results, researchers have attempted to identify factors that may account for inconsistencies in findings between studies.

One possible reason for inconsistencies in the literature is the failure of past research to examine the symptom component of the hopelessness theory. Hopelessness theorists have posited that hopelessness depression is characterized by a unique symptom profile. Hypothesized primary symptoms include sad affect and motivational deficits. Hypothesized secondary symptoms include suicidal ideation,

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lack of energy, psychomotor retardation, sleep disturbance, poor concentration, low self-esteem, and increased dependency. Although some symptoms of hopelessness depression overlap with the diagnostic criteria for major depression in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed. [DSM-IV]; American Psychiatric Association [APA], 1994), others are unique to hopelessness depression (i.e., increased dependency and low self-esteem). Furthermore, some symptoms of DSM-IV major depression (i.e., anhedonia, irritability, psychomotor agitation, and appetite disturbance) are not hypothesized to be part of the hopelessness depression symptom profile. The majority of studies examining the hopelessness theory's symptom component have provided support for this hypothesis (e.g., Abela, Gagnon, & Auerbach, 2007; Abela & Payne, 2003; Abela & Sarin, 2002; Alloy & Clements, 1998; Hankin et al., 2001; Metalsky & Joiner, 1997). Future research examining a test of the vulnerability-stress component of the theory in adolescents should therefore incorporate a test of the symptom component as the vulnerability-stress interaction is hypothesized to predict increases in hopelessness but not nonhopelessness depression symptoms. The fact that past research has failed to do so may partially account for inconsistencies in findings.

A second explanation for inconsistent findings is that researchers have examined the three depressogenic inferential styles featured in the hopelessness theory independently of one another without considering possible relationships between them. Doing so is likely to provide an inaccurate test of the hopelessness theory as youth who possess only one depressogenic inferential style but who show increases in depressive symptoms following negative events will appear to support the hopelessness theory in some analyses but to contradict it in others. The weakest link hypothesis posits that an individual is as vulnerable to depression as his or her most depressogenic inferential style makes him or her (Abela & Sarin, 2002). Therefore, according to this hypothesis, when testing the hopelessness theory, researchers should assess all three depressogenic inferential styles and determine each participant's degree of vulnerability using his or her most depressogenic style. In the first study to examine the weakest link hypothesis, 79 seventh graders completed measures assessing depressogenic inferential styles and depressive symptoms (Abela & Sarin, 2002). Ten weeks later, they completed measures assessing depressive symptoms and negative events. When examined individually, none of the three depressogenic inferential styles interacted with negative events to predict increases in depressive symptoms. Children's weakest links, however, interacted with negative events to predict increases in such symptoms. Subsequent research has provided equally strong support for this hypothesis in youth (Abela & McGirr, 2007; Abela, McGirr, & Skitch,

2007; Abela & Payne, 2003; Abela & Scheffler, 2008; Abela, Skitch, Adams, & Hankin, 2006).

A third possible source of discrepancies in the literature is the tendency of past research to study hopelessness theory in isolation. As there are many theories of depression, and its etiology is likely complex, a truly comprehensive understanding of the pathways leading to depression will ultimately stem from research that successfully integrates vulnerability factors from several models. Alloy et al. (2000) proposed an integrative model that combines hopelessness theory with response styles theory (Nolen-Hoeksema, 1987, 1991). Response styles theory posits that the way in which individuals respond to depressive symptoms influences both the duration and severity of their symptoms. Rumination involves focusing passively and repetitively on depressive symptoms and on their implications. In doing so, individuals do not actively take steps to reduce their symptoms or to correct the problems that they have identified. There has been consistent support for the hypothesis that rumination is associated with greater severity of depressive symptoms over time in adolescent samples (Abela, Aydin, & Auerbach, 2007; Abela, Brozina & Haigh, 2002; Schwartz & Koenig, 1996).

In line with Alloy et al.'s (2000) proposition, the current study examined whether depressogenic inferential styles predict increases in depressive symptoms following the occurrence of negative events in adolescents possessing high, but not low, levels of rumination. According to the causal mediation component of response styles theory, when individuals ruminate, they focus on the negative inferences they have made, likely making new pessimistic inferences and elaborating existing ones. Making a greater number of such inferences likely increases the likelihood of developing hopelessness and thus depression. Providing preliminary support for this integrative model, Alloy and colleagues (2000) reported that currently nondisordered university students who possessed both a negative cognitive style and a ruminative response style were more likely than students who possessed only one or neither of these vulnerability factors to have a past history of major depressive episodes. No study, to our knowledge, has examined whether this integrative model can be applied to adolescents.

Given that middle adolescence is an age when sex differences have already emerged, we also examined whether sex differences emerged in the current study. From a cognitive vulnerability-stress perspective, one possible explanation for sex differences in depression rates is that girls possess higher levels of vulnerability or experience higher levels of stress than boys. Several studies to date have provided support for such an approach to understanding sex differences in depression by demonstrating that adolescent girls report more depressogenic inferential styles (Abela, 2001; Abela &

Payne, 2003), higher levels of rumination (Schwartz & Koenig, 1996; Ziegert & Kistner, 2002), and a greater frequency of negative events (Ge, Lorenz, Conger, Elder, & Simons, 1994; Rudolph & Hammen, 1999) than adolescent boys. At the same time, other studies have failed to find such sex differences in depressogenic inferential styles (Hankin et al., 2001) or have reported that boys possess more depressogenic styles than girls (Lewinsohn et al., 2001). An additional possible explanation for sex differences in depression rates is that the strength of the association between cognitive vulnerability factors and depressive symptoms is greater in girls than boys. Although some studies have reported that depressogenic inferential styles are more strongly associated with increases in depressive symptoms following negative events in girls than in boys (Abela, 2001; Abela & McGirr, 2007; Abela, Skitch, et al., 2006), other studies have failed to find such a difference (Abela & Sarin, 2002; Abela & Seligman, 2000; Bennett & Bates, 1995; Lewinsohn et al., 2001) or have obtained the reverse finding (Hankin et al., 2001). Thus, we examined whether there are sex differences in levels of variables and if sex is a moderator of the relationship between vulnerability factors and depression.

The goals of the current study were fourfold: to provide a prospective test of the vulnerability-stress and symptom components of the hopelessness theory of depression, to test the vulnerability hypothesis of the response styles theory in a sample of adolescents, to test the integrative model previously proposed by Alloy et al. (2000), and to test possible models of sex differences in depression. The procedure involved an initial assessment of depressive symptoms, depressogenic inferential styles, and ruminative response style. Six weeks later, depressive symptoms as well as negative events were assessed. In line with both the vulnerability-stress and symptom components of hopelessness theory and the weakest link hypothesis, we hypothesized that a depressogenic weakest link would interact with the occurrence of negative events to predict increases from Time 1 to Time 2 in measures of hopelessness, but not non-hopelessness, depressive symptoms and more general depressive symptoms. In line with the vulnerability hypothesis of response styles theory, we hypothesized that a ruminative response style would be associated with increases in measures of both hopelessness and more general depressive symptoms. In line with the integrative model proposed by Alloy et al. (2001), we hypothesized that having a ruminative response style would accentuate the vulnerability to hopelessness depression symptoms of those individuals possessing a depressogenic weakest link. Finally, we hypothesized that girls would report higher levels of depressogenic inferential styles and rumination than boys and that the strength of the association between the Weakest Link \times Rumination \times Negative

Events interaction and change in depressive symptoms over time would be stronger in girls than in boys.

METHOD

Participants

Consent forms and letters detailing the project were sent to the parents of all ninth graders at participating schools. Parents who wished their children to participate returned the signed consent forms to their child's school. The consent rate was greater than 80% in all schools. The final sample consisted of 367 students (287 girls and 80 boys). Participants came from two private co-educational schools, one urban (195 girls and 70 boys), and one suburban (55 girls and 10 boys) public school, and one urban private girls school (37 girls). In terms of gender composition, the ratio of female to male participants at each school approximated the sex ratio at the school. The final sample was 85.3% Caucasian, 4.9% Asian, 3.8% African Canadian, 1.4% Hispanic, 0.8% Inuit, and 3.8% other. The mother tongue of 78.5% of the sample was French, 6.3% English, and 14.7% other. The mean age of the participants was 14.13 years ($SD = 1.34$). Although data on the socioeconomic status of students' families were not collected, all schools were located in predominantly upper middle-class areas. There were no site differences in terms of levels of any of our independent or dependent variables.

Measures

All questionnaires were translated into French by a certified English-French translator. The French translations were then backtranslated into English by a certified French-English translator. The backtranslations were subsequently compared to the original English versions of the questionnaires. Any discrepancies between the original English version and the backtranslations were examined to ensure that the French translation retained the intended meaning of the original item

Children's depression inventory (CDI; Kovacs, 1981). The CDI is a 27-item self-report questionnaire that measures the cognitive, affective, and behavioral symptoms of depression. Each item consists of three statements that increase by order of symptom severity. For each item, children are asked whether it describes how they have been thinking and feeling in the past week. Items are scored from 0 to 2 with a higher score indicating greater symptom severity. At the request of school principals, we removed one item that inquires about suicidality. Total scores on the questionnaire range from 0 to 52. The CDI possesses excellent internal

consistency, adequate test-retest reliability, and sensitivity in distinguishing children with major depressive disorders from nondepressed children (Saylor, Finch, Spirito, & Bennett, 1984; Smucker, Craighead, Craighead, & Green, 1986).

In line with Abela and D'Alessandro (2001), we created individual hopelessness depression symptom scores by summing the relevant items from the CDI. This resulted in six symptoms hypothesized to be symptoms of hopelessness depression including motivational deficits (Items 13 and 15), sadness (Items 1 and 10), lack of energy (Item 17), sleep disturbance (Item 16), low self-esteem (Items 3, 7, 8, 14, and 24), and loneliness (Items 20, 22, and 25). We then created a hopelessness depression symptom composite score by summing the relevant symptoms. We obtained alphas of .78 at Time 1 and .80 at Time 2 for the Hopelessness Depression subscale.

Children's attributional style questionnaire (CASQ; Seligman et al., 1984). The CASQ contains 48 items. Each item is a hypothetical event (24 negative and 24 positive) that respondents are asked to imagine has happened to them. Respondents are presented with two possible causes of each event and are asked to choose which cause best describes the way they would think if the event had happened to them. Each possible cause holds constant two attributional dimensions (internal-external, global-specific, and stable-unstable) while varying the third. The CASQ is scored by assigning a value of 1 to each internal, global, or stable response and 0 to each external, unstable, or specific response. There are eight items assessing each dimension, thus scores for each dimension range from 0 to 8. As the hypotheses of the current study only involved participants' attributional styles for negative events, only the 24 negative events items were used. In line with the hopelessness theory, we used the generality composite score to measure attributional style. This score is equivalent to the sum of all global and stable responses and can range from 0 to 16 with higher scores indicating a more depressogenic attributional style.

In a study examining the reliability and validity of the CASQ in children (aged 8–13), Seligman et al. (1984) found that CASQ scores were fairly consistent over a 6-month interval showing attributional style to be a stable individual difference amongst children ($r = .66$, $p < .001$). Cronbach's alpha for the negative events composite score ranged from .50 to .54 across administrations indicating moderate internal consistency. Regarding validity, children exhibiting depressive symptoms were more likely than nondepressed children to endorse internal, global, and stable explanations for negative events. Furthermore, a pessimistic attributional style predicted depressive symptoms at the 6-month

follow-up above and beyond initial levels of depression in children. Since this study, several other studies using the CASQ have obtained similar findings (e.g., Abela, 2001; Spence et al., 2002). In the current study, for the generality subscale, we obtained an alpha of .47 indicating modest internal consistency.

Children's cognitive style questionnaire (CCSQ; Abela, 2001). The CCSQ is a two-part questionnaire. Each part contains 12 items, each of which is a hypothetical negative event involving the child. As with the CASQ, children are instructed to imagine that the event happened to them and then to choose the response that would best describe the way they would think. Part 1 assesses the tendency to catastrophize the consequences of negative events. In Part 1, for each item, the child is given the following four choices: (a) This won't cause other bad things to happen to me, (b) This might cause other bad things to happen to me, (c) This will cause other bad things to happen to me, and (d) This will cause many terrible things to happen to me. Each response is assigned a value from 0 to 3 with higher scores indicating a greater tendency to catastrophize the consequences of negative events. Total scores are equivalent to the sum of all responses with scores ranging from 0 to 36. Part 2 assesses the tendency to view oneself as flawed or deficient following negative events. In Part 2, for each item, the child is given the following three choices: (a) This does not make me feel bad about myself, (b) This makes me feel a little bad about myself, and (c) This makes me feel very bad about myself. Each response is assigned a value of 0 to 2, with higher scores indicating a greater tendency to view oneself as flawed or deficient following negative events. Total scores are equivalent to the sum of all responses with scores ranging from 0 to 24.

In a study examining the reliability and validity of the CCSQ in third and seventh graders, Abela (2001) found scores on both subscales of the CCSQ to be moderately consistent over a 7-week interval ($r = .46-.63$, $p < .001$). Cronbach's alphas for the two subscales ranged from .64 and .81 across administrations indicating moderate internal consistency. Regarding validity, higher levels of depressive symptoms were associated with more depressogenic inferential styles about consequences and the self. Last, depressogenic inferential styles about consequences and the self each interacted with negative events to predict increases in depressive symptoms. In the current study, we obtained an alpha of .78 for the inferential style about consequences subscale and an alpha of .77 for the inferential style about the self subscale.

Children's response styles questionnaire (CRSQ; Abela et al., 2002). The CRSQ is modelled after Nolen-Hoeksema's Response Style Questionnaire

(Nolen-Hoeksema & Morrow, 1991). The CRSQ consists of 25 items, each of which describes a particular response to symptoms of depression. The items are grouped into three scales: Ruminative Response subscale (CRSQ–Rumination), (2) Distracting Response subscale (CRSQ–Distraction), and (3) Problem-Solving subscale (CRSQ–Problem solving). As the current study examined the effect of rumination on depressed mood, only the ruminative response subscale was used. The CRSQ–Rumination subscale includes 13 items describing responses to depressed mood that are self-focused (e.g., “Think about how alone you feel”). For each item, children are asked to indicate how often they respond in this way when they are feeling sad, ranging from 0 (*almost never*), to 1 (*sometimes*), 2 (*often*), or 3 (*almost always*). Scores range from 0 to 39 with higher scores indicating a greater tendency to ruminate in response to depressed mood. Past research using the CRSQ has reported high levels of internal consistency (Abela et al., 2002; Abela, Vanderbilt, & Rochon, 2004). CRSQ–Rumination subscale scores have been found to exhibit strong test-retest reliability over a 1-month interval ($r = .78$; Abela, Aydin, et al., 2007). Regarding validity, CRSQ–Rumination scores have been found to positively correlate with depressive symptoms as well as predict increases in depressive symptoms over time in both children and early adolescents (Abela et al., 2002; Abela, Aydin, et al., 2004; Abela et al., 2007). In this study, we obtained an alpha of .85, indicating strong internal consistency.

The children's life events scale (CLES; Coddington, 1972; Kanner, Feldman, Weinberger, & Ford, 1987). The CLES is a list of 59 hassles and negative life events that children may experience. For each item, respondents are asked whether they have experienced that event in the past 6 weeks. If they have experienced the event, they receive a score of 1. If they have not, they receive a score of 0. Score on the CLES can range from 0 to 59, with higher numbers indicating a greater number of stressful events. Thirty-seven items on the CLES come from either the original or revised versions of the Hassles Scale for Children (Kanner et al., 1987). The items on his scale were generated from the responses that children and early adolescents gave in interviews about stress in their lives. Studies have found the Hassles Scale for Children to relate to a wide variety of relevant variables such as anxiety, depression, distress, self-restraint, perceived social competence, and general self-worth (Kanner et al., 1987; Varni, Rubenfeld, Talbot, & Setoguchi, 1989). The remaining 22 CLES items come from the Coddington Life Stress Scale (CLSS; Coddington, 1972). The CLSS is the best-known and most widely used life stress measure for younger age groups (Johnson, 1986). CLSS scores have been found to relate to a wide variety of

relevant variables including physical health and psychological adjustment (see review by Johnson, 1986).

Procedure

Approval for the study was obtained from McGill University's Institutional Review Board prior to commencing the study. During the initial (Time 1) assessment, adolescents completed the following questionnaires: (a) CDI (Kovacs, 1981), (b) CASQ (Seligman et al., 1984), (c) CCSQ (Abela, 2001), and (d) CRSQ (Abela et al., 2000). Six weeks later, researchers returned to the schools to administer the follow-up assessment (Time 2) comprising the following measures: CDI (Kovacs, 1981) and CLES (Coddington, 1972; Kanner et al., 1987). At the start of each assessment, students were told that their participation was voluntary and that they could choose not to participate if they desired. No students decided not to participate. Following the completion of questionnaires at Time 2, students were fully debriefed. Throughout both assessments, multiple research assistants were available to respond to students' questions. Out of the 367 participants, 93.2% completed both assessments. The 25 students who did not complete the follow-up assessment did not differ from the 342 who did on any Time 1 variable.

RESULTS

Descriptive Data

To compute participants' “weakest link” scores, we standardized scores on the generality subscale of the CASQ and on the Consequences and Self subscales of the CCSQ. Each adolescent's weakest link score was equal to the highest of his or her three standardized scores. The difference between the standardized scores for the adolescents' most depressogenic inferential style and least depressogenic inferential style ranged from .03 to 4.25 ($\mu = 1.24$, $SD = .81$) with 22.1% of adolescents exhibiting a difference greater than 1.75. Attributional style was the weakest link for 36.3% of the adolescents. The inferential style about consequences was the weakest link for 29.7% of the adolescents. The inferential style about the self was the weakest link for 34.1% of the adolescents. Of the adolescents who scored in the top quartile on at least one of the three measures assessing depressogenic inferential styles, 24.8% also scored in the bottom quartile on at least one of the other measures.

Girls reported higher levels of depressive symptoms than boys during both the initial, $t(365) = 3.55$, $p \leq .001$, and follow-up, $t(341) = 2.82$, $p \leq .001$, assessments. Girls also reported higher levels of hopelessness depression symptoms than boys during both the initial, $t(365) = 3.70$, $p \leq .001$, and follow-up assessment, $t(341) = 3.21$, $p \leq .001$. In line with the response styles

TABLE 1
Means, Standard Deviations, and Intercorrelations Among All Study Measures

	1	2	3	4	5	6	7	8	9	10
1. Time 1 CDI	12.09 (6.75)									
2. Time 1 CDI-HD	.79***	6.74 (4.04)								
3. CASQ-GEN	.58***	.47***	4.27 (2.30)							
4. CCSQ-CONS	.41***	.44***	.29***	11.56 (4.69)						
5. CCSQ-SELF	.28***	.33***	.17***	.56***	11.36 (4.05)					
6. Weak Link	.57***	.51***	.66***	.66***	.64***	0.67 (0.89)				
7. Rumination	.50***	.48***	.33***	.45***	.49***	.47***	14.78 (7.40)			
8. Time 2 CDI	.72***	.61***	.54***	.27***	.18**	.49***	.39***	10.74 (7.18)		
9. Time 2 CDI-HD	.65***	.69***	.49***	.35***	.25***	.49***	.43***	.78***	6.43 (4.29)	
10. CLES	.32***	.21***	.26***	.12*	-.04	.24***	.11*	.39***	.34***	10.17 (8.15)

Note: Means and standard deviations (in parentheses) are on the diagonal. CDI = Children Depression Inventory; CD-HD = Children's Depression Inventory, Hopelessness Depression Symptoms subscale; CASQ-GEN = Children's Attributional Style Questionnaire, Generality subscale; CCSQ-CONS = Children's Cognitive Style Questionnaire, Inferential Style About Consequences subscale; CCSQSELF = Children's Cognitive Style Questionnaire, Inferential Style About the Self subscale; Weak Link = Weakest link composite score; Rumination = Children's Response Style Questionnaire, Rumination subscale; CLES = Children's Life Events Scale.

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

theory, girls reported higher levels of rumination than boys, $t(365) = 3.77$, $p \leq .001$. Girls also reported more depressogenic inferential styles about consequences, $t(364) = 3.49$, $p \leq .001$, and the self, $t(365) = 3.75$, $p \leq .001$, than boys as well as exhibited higher weakest link scores, $t(362) = 2.96$, $p \leq .01$. There were no sex differences, however, in levels of attributional style, $t(365) = 1.14$, ns , and negative events, $t(325) = 0.10$, ns .

Test of the Hopelessness Theory

To examine the vulnerability-stress component of the hopelessness theory, hierarchical multiple regression analyses were carried out (Cohen & Cohen, 1983). This approach allows for a stringent test of the contribution of the cognitive vulnerability-stress interaction, above and beyond the contribution of either the vulnerability or the stressor alone in addition to initial levels of depressive symptoms. The dependent variable was CDI scores at Time 2. First, CDI scores at Time 1 (the covariate) were entered into the equation. This controlled for any initial differences between participants in baseline level of symptoms meaning that we were essentially using our independent variables to predict residual change scores. Second, main effect variables (i.e., negative events and weakest link composite scores) were entered into the equation. Last, the interaction between negative events and weakest link composite scores was entered into the equation. Separate analyses were conducted for CDI total scores and CDI hopelessness depression scores. Consistent with Cohen and Cohen (1983), all variables within a given set were entered simultaneously. Individual variables within a set were not interpreted unless the set as a whole was significant. In addition, in all cases, the assumption of homogeneity of covariance was met (Joiner, 1994).

Results pertaining to the interaction between weakest link composite scores (Weak Link) and negative events (CLES) in predicting change in CDI total scores are presented in the top panel of Table 2. The main effect set significantly predicted residual change in CDI scores from Time 1 to Time 2. Analysis within the main effect set indicated that both a greater number of negative events and a more depressogenic weakest link were uniquely associated with increases in depressive symptoms. Last, of primary importance to the hopelessness theory, however, the Weak Link \times CLES interaction did not significantly predict residual change in CDI total scores from Time 1 to Time 2.

Results pertaining to the interaction between Weak Link and CLES in predicting change in CDI hopelessness depression (CDI-HD) scores are presented in the bottom panel of Table 2. The main effect set significantly predicted residual change in CDI-HD scores from Time 1 to Time 2. Analysis within the main effect set indicated that both a greater number of negative events and a more depressogenic weakest link were uniquely associated with increases in hopelessness depression symptoms. Last, of primary importance to the hopelessness theory, the Weak Link \times CLES interaction was a significant predictor of residual change in CDI-HD scores from Time 1 to Time 2.

To examine the form of the Weak Link \times CLES interaction, as recommended by Cohen and Cohen (1983), residual CDI-HD change scores were calculated by inserting specific values for Weak Link and CLES scores (i.e., 1 SD above and below the mean) into the regression equation summarized in the bottom panel of Table 2. The results of such calculations are presented in Figure 1. Amongst ninth graders who experienced a high number of negative events, those with a depressogenic weakest link showed increases in CDI-HD scores,

TABLE 2

Weakest Link Scores Predicting Residual Change in CDI Scores (Top Panel) and CDI-HD Scores (Bottom Panel) from Time 1 to Time 2

Order of entry	Predictor	Cumulative R ²	F for Increment in R ² for Set	t for Within-Set Predictors	df	Partial Correlation (pr)	Squared Partial (pr ²)
1	TICDI	.52	348.57***		1, 320	.72	.52
2	Main Effect Set	.55	11.66***		2, 318		
	CLES			4.17***	318	.23	.05
	Weak Link			2.14*	318	.12	.01
3	Weak Link × CLES	.56	2.14		1, 317	.08	.01
1	TICDI-HD	.47	285.98***		1, 320	.69	.48
2	Main Effect Set	.53	18.59***		2, 318		
	CLES			4.54***	318	.25	.06
	Weak Link			3.32**	318	.18	.03
3	Weak Link × CLES	.54	4.43*		1, 317	.12	.01

Note: TICDI=Time 1 Children’s Depression Inventory; TICDI-HD=Time 1 Children’s Depression Inventory, Hopelessness depression subscale; CLES=Children’s Life Events Scale. Weakest Link = Children’s most depressogenic inferential style.
 p* < .05. *p* < .01. ****p* < .001.

whereas those without such a style did not. Adolescents who experienced a low number of negative events did not show increases in CDI-HD scores regardless of whether or not they possessed a depressogenic weakest link (residual change scores were -1.71 and -1.52, respectively).

Test of the Response Styles Theory of Depression

To provide a test of the response styles theory of depression, we performed hierarchical multiple regression analyses (Cohen & Cohen, 1983). Time 2 CDI scores were the dependent variable. Time 1 CDI scores were entered first, followed by rumination scores. Rumination was significantly associated with increases in CDI-HD

scores (*pr* = .15), *F*(1, 340) = 7.77, *p* ≤ .01, but not CDI scores (*pr* = .03), *F*(1, 340) = 0.40, *ns*, between Time 1 and Time 2.

Test of the Integrative Model

To examine our integrative model, Time 2 CDI scores were regressed on Time 1 CDI scores, Weak Link, CRSQ, CLES, and all two- and three-way interactions involving Weak Link, CRSQ and CLES. Separate analyses were conducted for CDI and CDI-HD scores. Contrary to our integrative model, neither the Weak Link × CRSQ interaction (*pr* = -.05), *t*(314) = -0.87, *ns*; the CRSQ × CLES interaction (*pr* = .03), *t*(314) = 0.44, *ns*; nor the Weak Link × CRSQ × CLES interaction (*pr* = -.01), *t*(313) = -0.25, *ns*, were a significant predictor of residual change in CDI scores. Similarly, neither the Weak Link × CRSQ interaction (*pr* = -.02), *t*(314) = -0.37, *ns*; the CRSQ × CLES interaction (*pr* = .05), *t*(314) = 0.84, *ns*; nor the Weak Link × CRSQ × CLES interaction (*pr* = -.04), *t*(313) = -0.71, *ns*, were a significant predictor of residual change in CDI-HD scores.

Sex as a Moderator of the Weak Link × CRSQ × CLES Interaction

To examine whether sex served as a significant moderator of the association between the Weak Link × CRSQ × CLES interaction and residual change in depressive symptoms during the follow-up interval, Time 2 CDI scores were regressed on Time 1 CDI scores, Sex, Weak Link, CRSQ, CLES, and all two-, three-, and four-way interactions involving Sex, Weak Link, CRSQ and CLES. Separate analyses were conducted for CDI and CDI-HD scores. The Sex × Weak Link × CRSQ × CLES interaction was not a significant

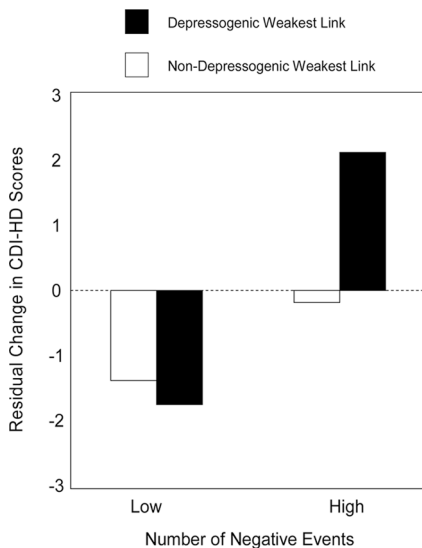


FIGURE 1 Residual change in hopelessness depression symptoms from Time 1 to Time 2 as a function of negative events and the weakest link composite scores.

predictor of residual change in either CDI scores ($pr = .02$), $F(1, 305) = 0.10$, *ns*, or CDI-HD scores ($pr = .03$), $F(1, 305) = 0.24$, *ns*.

DISCUSSION

The results of this study provide partial support for our hypotheses. In line with the vulnerability-stress and symptom component of the hopelessness theory, a depressogenic weakest link interacted with the occurrence of negative events to predict increases in hopelessness depression symptoms but not in depressive symptoms more generally. Providing partial support for the response styles theory, rumination was associated with change in hopelessness depression symptoms but not depressive symptoms more generally. Last, our findings failed to provide support for our integrative model, as a ruminative response style did not moderate the association between a depressogenic weakest link and change in depressive symptoms following the occurrence of negative events.

Results from this study provide support for the symptom component of the hopelessness theory. Consistent with past research examining the symptom component of the theory in adolescents (Abela & Payne, 2003; Abela & Sarin, 2002; Alloy & Clements, 1998; Hankin et al., 2001; Metalsky & Joiner, 1997), a depressogenic weakest link interacted with negative events to predict increases in hopelessness depression symptoms but not more general depressive symptoms, suggesting that hopelessness depression is indeed characterized by a unique symptom profile. The current findings have important implications for future research examining the vulnerability-stress component of the hopelessness theory in adolescents. Researchers should examine hopelessness depression symptoms separately rather than relying on overall composite scores of measures, such as the CDI. The failure of past research to do so may partially account for discrepancies between studies.

The results of our study also provide support for operationalizing cognitive vulnerability to depression, from the perspective of the hopelessness theory, utilizing a weakest link approach (Abela & Sarin, 2002). The weakest link hypothesis may be one of the factors that accounts for discrepancies in past research examining the vulnerability-stress component of the hopelessness theory in adolescents. According to the weakest link hypothesis, the degree of support a given study obtains for each individual inferential style is likely to vary according to the proportion of adolescents in the sample for whom that style is the weakest link. It is likely that past research that has failed to provide support for the attributional vulnerability hypothesis of the hopelessness theory in youth (e.g., Abela, 2001; Hammen,

Adrian, & Hiroto, 1988; Turner & Cole, 1994) failed to do so because attributional style was not a common weakest link among the youth in the sample. The weakest link hypothesis is likely to have particularly important implications for research on the hopelessness theory in youth. Although research examining depressogenic inferential styles about causes, consequences, and the self in adults has not found them to be empirically distinguishable (Abela, 2002; Metalsky & Joiner, 1992), research with youth samples has (Abela, 2001; Abela & Sarin, 2002). Given that a significant proportion of adolescents exhibit a range in their styles of thinking, a weakest link approach is particularly warranted to provide an adequate test of the vulnerability-stress component of the hopelessness theory in this age group.

Our results pertaining to the response styles theory indicated that higher levels of rumination were also associated with increases in hopelessness depression symptoms but not in more general depressive symptoms. One possible reason for the similar findings with respect to the hopelessness and response styles theories is that the causal-mediation components of these two theories contain some similarities. According to the hopelessness theory, hopelessness is the proximal sufficient cause of hopelessness depression; that is, once an individual develops hopelessness, he or she will inevitably develop hopelessness depression. According to the response styles theory, negative cognitions, including hopelessness, mediate the relationship between a ruminative response style and increases in depressive symptoms (Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998; Lyubomirsky & Nolen-Hoeksema, 1993). It is possible that ruminators' increased likelihood of making pessimistic inferences makes them especially vulnerable to the development of hopelessness depression symptoms. At the same time, as the response styles theory also includes additional mediational pathways not featured in the hopelessness theory (i.e., rumination interferes with effective problem solving as well as with engagement in instrumental behaviors), additional research is needed examining whether rumination predicts a wider overall range of symptoms than do the depressogenic inferential styles specifically associated with hopelessness depression.

The current pattern of results also offers one possible explanation for the sex differences that emerge in adolescence, as girls begin to show a greater prevalence of depression than boys. In line with the response styles theory, the girls in our sample reported higher levels of rumination than the boys. Girls also reported more depressogenic inferential styles about consequences and the self as well as more depressogenic weakest links. Such a finding suggests that adolescent girls are more likely to focus on the negative emotions that they

experience in response to the stressors that occur in their lives, as well as to make a greater number of depressogenic inferences about the self-implications and consequences of such events. At the same time, consistent with the bulk of past literature (Abela & Sarin, 2002; Abela & Seligman 2000; Bennett & Bates, 1995; Hankin et al., 2001; Lewinsohn et al., 2001), no support was obtained for sex as a moderator of the association between the Weakest Link \times Rumination \times Negative Events and increases in depressive symptoms. Thus, in our study, sex differences in levels of cognitive vulnerability factors rather than sex differences in the strength of the associations among variables appears to better explain sex differences in depression.

The failure of the current study to provide support for the integrative model (Alloy et al., 2000) calls for a closer examination of its theoretical components. Regarding the response styles theory, it is possible that multiple types of ruminative response styles exist, only some of which operate according to a vulnerability-stress framework. Results from studies examining the response styles theory within a vulnerability-stress framework have obtained mixed results. For example, Nolen-Hoeksema, Larson, and Grayson (1999) found there to be an interaction between a ruminative response style and chronic stress in predicting higher levels of depressive symptoms. At the same time, using a sample of university students, Sarin, Abela and Auerbach (2005) reported that the association between rumination and increases in depressive symptoms over time was not moderated by the occurrence of negative events. Robinson and Alloy (2003) have proposed that stress-reactive rumination—the tendency to ruminate about pessimistic inferences made following negative events—operates within a vulnerability-stress framework whereas emotion focused rumination (as operationalized in response styles theory) does not. As such, only stress-reactive rumination would increase risk for depression following the occurrence of negative life events. Robinson and Alloy demonstrated that stress-reactive rumination represents a construct independent from emotion-focused rumination. Of particular relevance to our study, stress-reactive rumination was shown to interact with negative cognitive styles to predict greater number and duration of major depressive episodes over a 2½-year interval, whereas emotion focused rumination did not exhibit such an interaction. Future research is likely to benefit from examining alternative integrative approaches, as doing so would lead to a richer understanding of the processes underlying the onset of depression.

Several limitations should be noted. First, self-report measures were used to assess depressive symptoms and stress. Although measures that ask participants simply

to indicate whether events occurred are less likely to be influenced by informant bias than measures that ask participants to rate severity, results need to be replicated using clinical interviews, since self-report measures are not necessarily generalizable to clinically significant levels of depression. Second, the homogeneity of the sample in terms of ethnicity, socioeconomic status, and cultural background limits the generalizability of the results obtained. Future research is needed to examine the hypotheses considered in our study using more diverse samples. Third, the current study is further limited by the low internal consistency of the CASQ. Although the CASQ is widely used, it possesses marginal psychometric properties. A measure of attributional style with a higher level of internal consistency is needed to negate the possibility that inconsistencies in the literature are due to the poor psychometric properties of the measure. Fourth, our study focused specifically on a sample of ninth-grade students who were followed for a 6-week period. We were therefore unable to examine whether our predictor variables played a role in the increases in depression rates and the emergence of sex differences in depression that occur during this period of development (Hankin et al., 1998; Lewinsohn et al., 1994). Future research using a longer follow-up interval as well as multiple follow-up assessments is needed to examine these critical developmental issues. Last, the current study did not examine specificity. Future research should assess additional types of symptomatology (e.g., anxious symptoms, substance abuse, externalizing disorders) to examine whether a depressogenic weakest link and a ruminative response style predict depressive symptoms specifically or other forms of psychopathology as well.

Implications for Research, Policy, and Practice

In sum, the results of our study provide full support for both the symptom and vulnerability-stress components of hopelessness theory, partial support for the response styles theory, and no support for the integrative model. The study identified specific cognitive factors that confer vulnerability to depression in the age group considered. The study also identified sex differences in levels of key variables in the models examined including depressogenic inferential styles and rumination. Such sex differences are important to note as an understanding of these differences may lead to the identification of pathways to depression, and the development of treatment and prevention approaches, specifically tailored to boys and girls. As depressive disorders become increasingly prevalent among young people in Western societies, a richer understanding of the processes and mechanisms underlying the etiology of depression is sorely needed.

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