

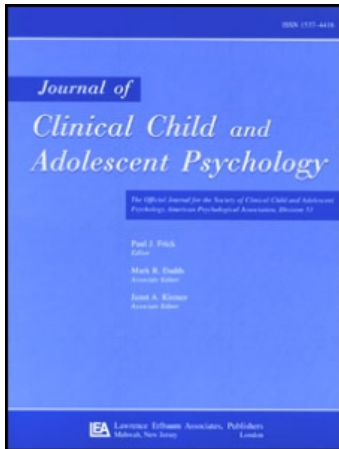
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## Journal of Clinical Child & Adolescent Psychology

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title-content=t775648094>

### Rumination and Depression in Adolescence: Investigating Symptom Specificity in a Multiwave Prospective Study

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Online Publication Date: 01 October 2008

**To cite this Article** Hankin, Benjamin L.(2008)'Rumination and Depression in Adolescence: Investigating Symptom Specificity in a Multiwave Prospective Study',*Journal of Clinical Child & Adolescent Psychology*,37:4,701 — 713

**To link to this Article:** DOI: 10.1080/15374410802359627

**URL:** <http://dx.doi.org/10.1080/15374410802359627>

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## REGULAR ARTICLES

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# Rumination and Depression in Adolescence: Investigating Symptom Specificity in a Multiwave Prospective Study

Benjamin L. Hankin

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A ruminative response style has been shown to predict depressive symptoms among youth and adults, but it is unclear whether rumination is associated specifically with depression compared with co-occurring symptoms of anxiety and externalizing behaviors. This prospective, multiwave study investigated whether baseline rumination predicted prospective elevations in depressive symptoms specifically. Rumination was assessed at baseline in a sample of early and middle adolescents ( $N=350$ , 6–10th graders). Symptom measures of depression, anxious arousal, general internalizing, and conduct/externalizing problems with good discriminant validity were assessed at four time points over a 5-month period. Results using hierarchical linear modeling show that rumination predicted prospective fluctuations in symptoms of depression and general internalizing problems specifically but not anxious arousal or externalizing problems. Rumination predicted increasing prospective trajectories of general internalizing symptoms. Baseline rumination interacted with prospective co-occurring fluctuations of anxious arousal and externalizing behaviors over time to predict the highest levels of prospective depressive symptoms. Rumination partly mediated the sex difference (girls > boys) in depressive and internalizing symptoms.

Rumination has captured the attention of researchers, including those studying emotion, social, clinical, developmental, and cognitive psychology (Papageorgiou & Wells, 2004; Wyer, 1996). Rumination has been defined as the tendency to focus repetitively on symptoms of emotional distress as well as the potential meaning, causes, and consequences of these symptoms without trying to solve the problems contributing to the emotional distress (Nolen-Hoeksema, 1991). Since Nolen-Hoeksema originally proposed Response Styles Theory (RST) and the concept of rumination, a large corpus of experimental, cross-sectional, and longitudinal studies, mostly among adults, has been conducted (see Lyubomirsky & Tkach, 2004; Thomson, 2006, for

reviews). In addition, a handful of more recent studies have examined the association between rumination and depressive symptoms among children and adolescents (see Abela & Hankin, 2007; Lakdawalla, Hankin, & Mermelstein, 2007, for reviews). Prospective studies of youth show that those who engage in ruminative responses to depressed mood are more likely to exhibit future elevations of depressive symptoms (e.g., Abela, Brozina, & Haigh, 2002; Abela, Vanderbilt, & Rochon, 2004; Broderick & Korteland, 2004; Burwell & Shirk, 2007; Nolen-Hoeksema, Stice, Wade, & Bohon, 2007; Schwartz & Koenig, 1996; Ziegert & Kistner, 2002).

Yet despite the extant knowledge on the relation between rumination and depressive symptoms among youth, several gaps exist. The study presented here seeks to extend the knowledge base on the role of rumination as a vulnerability to depression specifically among youth by investigating whether a ruminative response style predicts prospective elevations of depressive symptoms compared with other forms of negative affect and emotional distress, including specific anxiety

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This work was supported, in part, by NIMH grants R03-MH 066845 and 1R01HD054736-01A1 and a NSF grant 0554924 to Benjamin L. Hankin.

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symptoms (i.e., physiological anxious arousal), general internalizing/negative affective symptoms, and externalizing/behavioral problems. To do this, a multiwave longitudinal design was used with a moderately large sample of both male and female early and middle adolescents.

### DEPRESSION CO-OCCURRENCE WITH OTHER EMOTIONAL AND BEHAVIORAL PROBLEMS

Depression and other emotional and behavioral problems, such as anxiety and conduct disorders, commonly co-occur (Angold, Costello, & Erkanli, 1999; Newman et al., 1998; see Hankin & Abela, 2005). Comorbid depression is associated with more severe symptoms and correlates as well as with worse clinical course and potential treatment outcomes (Birmaher et al., 1996). Anxiety typically precedes the development of depression (Avenevoli, Stolar, Li, Dierker, & Merikangas, 2001; Kim-Cohen et al., 2003; Pine, Cohen, Gurley, Brook, & Ma, 1998), and earlier externalizing problems tend to predict later depressive symptoms (Kim-Cohen et al., 2003). It is important to understand patterns of comorbidity to advance knowledge on etiological theories and improve specificity of assessment and potential treatment for these different emotional and behavioral problems. Establishing evidence for predictive specificity is a valuable step in evaluating and validating proposed etiological processes.

However, relatively few studies in the literature have tested the specificity of etiological influences contributing to depression and overlapping anxiety and externalizing symptoms. Past research has identified multiple vulnerability factors for depression (e.g., Garber, 2000; Hankin & Abela, 2005; Rudolph, Hammen, & Daley, 2006), anxiety (e.g., Albano, Chorpita, & Barlow, 2003), and externalizing problems (e.g., Hinshaw & Lee, 2003), yet considerably less research has studied the degree to which these vulnerability factors are specific to depressive symptoms or common to depressive, anxious, and externalizing symptoms.

### SYMPTOM SPECIFICITY OF RST

Originally RST was proposed as an explanation for the development and maintenance of unipolar depression, so it is reasonable to propose that rumination might be a specific etiological risk factor to depression. Yet rumination is conceptually and empirically linked with other social psychological constructs (self-concept, self-focus) that are broad risk factors for general negative affect (Ingram, 1990). For example, private self-consciousness, the tendency to focus on and analyze one's self

(Fenigstein, Scheier, & Buss, 1975), is linked with various forms of emotional distress (e.g., Ciesla & Roberts, 2002; Hull, Levenson, Young, & Sher, 1983).

Only a couple of empirical studies among youth have examined whether rumination is associated with depressive symptoms, in particular, or with various aspects of negative affect and emotional distress. The first was a cross-sectional study of adolescents (ages 12–17) that found that rumination correlated more strongly with symptoms of general anxiety and worry than with depression and that rumination did not associate significantly with depressive symptoms after controlling for worry (Muris, Roelofs, & Meesters, 2004). Second, a prospective longitudinal study of adolescent girls showed that rumination predicted depressive, bulimic, and substance use symptoms, but not externalizing behaviors, and that depressive and bulimic symptoms, but not substance use problems, reciprocally predicted changes in rumination over time (Nolen-Hoeksema et al., 2007). Finally, these few studies with youth are consistent with adult research showing that rumination is broadly associated with general negative affect, including depression and mixed anxiety/depression (e.g., Nolen-Hoeksema, 2000; see Thompson, 2006, for review).

In summary, the available evidence suggests that rumination likely may not be associated specifically with depressive symptoms among youth because it may relate equally to general negative affective symptoms, but these conclusions are tempered by the limited number of studies as well as specific limitations of the past research. In particular, Muris and colleagues' (2004) work was cross-sectional, so there is a need to replicate findings with a prospective, longitudinal design. Also, Nolen-Hoeksema and colleagues' (2007) study was composed of only girls and did not examine anxiety symptoms, so replication of their main findings with boys as well as girls and extension of symptom specificity to anxiety symptoms is needed.

Finally, none of the past research has considered and examined different facets of negative affect and emotional distress from a theoretically guided, empirically supported framework. In particular, the tripartite theory of anxiety and depression (Clark & Watson, 1991) specifies that both depression and anxiety are comprised of general negative affect (e.g., symptoms of worry, poor concentration, etc.), whereas anxiety can be differentiated from general negative affect and depression by focusing on and assessing the more specific physiological symptoms of anxious arousal (e.g., heart palpitations, shortness of breath, etc.). Research with youth (e.g., Brown, Chorpita, & Barlow, 1998; Lonigan, Phillips, & Hooe, 2003) has tested and validated the tripartite theory of anxiety and depression showing that anxious arousal is more specific to anxiety and is conceptually and empirically separable from

general negative affect and depression. The one youth study to investigate specificity of rumination for depression compared with anxiety among youth (Muris et al., 2004) used a measure of worry, which is most associated with broad negative affect rather than specific anxious arousal, and as such will overlap most with depression. Thus, it is unclear and unknown whether rumination is related to anxiety, as well as depression, because most assessments of anxiety tap mostly general negative affect (e.g., worry) that is common to general anxiety and depression rather than physiological arousal specific to anxiety.

### GENERAL METHODOLOGICAL AND DESIGN CONSIDERATIONS

Evaluating associations between rumination and emotional distress among youth has been hampered by the lack of rigorous, powerful study designs. Almost all of the extant research has used either cross-sectional (Muris et al., 2004; Park, Goodyer, & Teasdale, 2004; Wilkinson & Goodyer, 2006; Ziegert & Kistner, 2002) or two-time-point prospective designs (Abela et al., 2002, 2004; Broderick & Korteland, 2004; Burwell & Shirk, 2007; Schwartz & Koenig, 1996). Only one study (Nolen-Hoeksema et al., 2007) used a prospective multi-wave design to examine the role of rumination in predicting future emotional distress symptoms, and only girls were included in this sample. Developmental methodologists have noted that two-time-point panel designs are not much more informative than simple cross-sectional designs (Curran & Willoughby, 2003), and cross-sectional research cannot disentangle whether rumination is a cause, consequence, or correlate of emotional distress (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001). Multiwave studies (i.e., a minimum of three time points) are needed to test rigorously and accurately longitudinal patterns and developmental processes. Second, the past studies were comprised of predominantly middle-class White youth, so the extent to which rumination contributes to future emotional distress is unclear because sufficiently ethnically diverse samples have not been studied. It is important to investigate etiological theories with diverse samples to enhance generalizability of findings and to explore possible ethnic differences in rumination and its association with emotional distress. Third, whether there is a reliable, robust sex difference in rumination is unclear because past findings have been equivocal (e.g., no sex difference found in Abela et al., 2002, with 3rd and 7th graders, but a sex difference observed in Schwartz & Koenig, 1996, with 9th–12th graders), or a sample of only girls has been studied (Nolen-Hoeksema et al., 2007) that precludes an examination

of sex differences. Nolen-Hoeksema (e.g., Nolen-Hoeksema & Girgus, 1994; Nolen-Hoeksema, Larson, & Grayson, 1999) and others (e.g., Hankin & Abramson, 2001) clearly hypothesized that girls will exhibit greater rumination than boys and that rumination may explain why more girls exhibit more depressive and general internalizing symptoms.

### THE CURRENT INVESTIGATION

This study aims to provide a more powerful test of RST's ruminative response style as a possible specific predictor of depressive symptoms compared with anxiety and externalizing symptoms. The investigation used a four-wave prospective design among a moderately large and ethnically diverse sample of 6th to 10th graders. It was hypothesized that baseline rumination would predict prospective elevations in depressive and general internalizing symptoms (i.e., broad negative affect) but not externalizing behaviors or specific, anxious arousal symptoms.

### METHOD

#### Participants

Participants were youth who were recruited from five Chicago area schools. Schools were selected to represent ethnic and socioeconomic diversity typical of the Chicago area. Selected schools included one inner-city private middle school, one affluent private middle school, and three public schools (one middle and two high schools) serving predominantly middle-class neighborhoods. There were 467 students available in the appropriate grades (6th–10th) from these selected schools and invited to participate. Parents of 390 youth (83.5%) provided active consent; all 390 youth were willing to participate. 356 youth (91%) completed the baseline questionnaire. The 34 students who were willing to participate but did not complete the baseline visit were sick or absent from school and were unable to reschedule. There were no significant differences in demographic characteristics (age, sex, ethnicity) between the number of available youth in schools ( $N = 467$ ), those who provided consent (390), and those who participated (356). Data were examined from 350 youth who provided complete data (symptoms and rumination) at baseline. Rates of participation in the study decreased slightly at each wave of follow-up: Wave 2 ( $N = 303$ ), Wave 3 ( $N = 308$ ), and Wave 4 ( $N = 345$ ). Age ranged from 11 to 17 ( $M = 14.5$ ,  $SD = 1.40$ ); 57% were female, 13% Latino, 6% Asian or Pacific Islander, 21% African American, 53% White, and 7% bi- or multiracial.

## Procedures

Students participated in this study with active parental informed consent. Permission to conduct this investigation was provided by the school districts and their Institutional Review Boards, school principals, the individual classroom teachers, and university Institutional Review Board. Trained research personnel visited classrooms in the schools and briefly described the study to youth, and letters describing the study were sent home to parents. Specifically, students and parents were told that this study was about adolescent mood and experiences and participation would require completion of questionnaires at four different time points. Students who agreed to participate and returned active parental consent read and signed an informed child assent form after asking any questions about the study. Youth completed a battery of questionnaires during class time and were debriefed at the end of the study. Participants completed questionnaire packets at four time points over a 5-month period, with approximately 5 weeks between each time point. The spacing for the follow-up intervals was chosen based on past research (e.g., Hankin, Abramson, & Siler, 2001) that found cognitive vulnerability predicted prospective depressive symptoms using a 5-week follow-up. Also, because understanding the prospective dynamics among co-occurring symptoms of depression, anxiety, internalizing, and externalizing problems was a key aspect of the study, a relatively short-time frame was used to provide enhanced, accurate recall of symptoms (see Costello, Erkanli, & Angold, 2006, for evidence that shorter time frames provide more accurate, less biased findings). Youth were compensated \$10 for their participation at each wave in the study, for a possible total of \$40 for completing all four assessments.

## Measures

*Children's depression inventory (CDI; Kovacs, 1981).* The CDI is a self-report measure of depression in children and adolescents. Each of 27 items is rated on a 0 to 2 scale. Reported scores are the average item scores of all items (range = 0–2). Higher scores indicate more depression. The CDI has been shown to be reliable (internal consistency and test–retest) and has demonstrated good validity (Klein, Dougherty, & Olino, 2005; Kovacs, 1981, 2001; Smucker, Craighead, Craighead, & Green, 1986). The range of CDI scores from this sample (total score mean CDI was 13.06;  $SD = 8.69$ ) was comparable to published norms (Kovacs, 2001). Youth completed the CDI at all four time points.

*Mood and anxiety symptom questionnaire (MASQ; Watson et al., 1995).* The MASQ for this study was

modified from the original MASQ, which contains 90 items to assess the general distress and specific anxiety and depressive symptoms based on the tripartite theory of anxiety and depression (Clark & Watson, 1991). For this study, only the Anxious Arousal (ANXAR) subscale was used to assess relatively specific physiological arousal symptoms that are not overly saturated with general negative affect. Youth responded to 10 ANXAR items on a Likert scale from 1 to 5 and reported scores are the average item scores of all items (range = 1–5). These items were selected from the 17 total items from the original MASQ based on factor analytic results (Watson et al., 1995) indicating these were the 10 items with the highest loading on the ANXAR factor. Reliability and validity of the MASQ has been demonstrated in previous studies (e.g., Hankin, Wetter, Cheely, & Oppenheimer, in press; Watson et al., 1995). The MASQ was given at all four time points.

*Strengths and difficulties questionnaire (SDQ; Goodman, 2001).* The SDQ is a brief 25-item questionnaire that assesses general internalizing/emotional and externalizing/behavioral problems. A five-factor structure, consisting of emotional, conduct, hyperactivity-inattention, peer, and prosocial factors, has been supported in past research with large samples of youth and parents (Goodman, 2001). The externalizing factor, comprising conduct problems (5 items; e.g., “I get very angry and often lose my temper”), and the internalizing factor, comprising emotional problems (5 items; e.g., “I have many fears, I am easily scared”), were used for the present study. Normative data are available for the SDQ from a large national sample of children (see Goodman, 2001). The descriptive statistics (means, standard deviation; see Table 1) from the present sample matched the descriptive data from the normative database closely. The SDQ has been shown to be reliable and valid in past research (Goodman, 2001). Reported scores are the average item scores of all items (range = 0–2). It was given at all four time points.

*Children's response style questionnaire (Abela, Vanderbilt, & Rochon, 2004).* The Children's Response Style Questionnaire, a measure of the constructs featured in RST, is based on the Response Styles Questionnaire (Nolen-Hoeksema & Morrow, 1991). The Children's Response Style Questionnaire uses 25 items clustered into the three general response styles of rumination, distraction, and problem solving. Children are asked to rate how frequently they respond to a sad mood with the particular response. The 13-item subscale of rumination was used in this study. Scores on the rumination scale range from 0 to 39. A higher score indicates a more frequent use of that response style.

TABLE 1  
Descriptive Statistics and Correlations Among Main Measures at Baseline and Over Time

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. RUM																	
2. INTERN1	.38																
3. CDI1	.31	.65															
4. ANX1	.23	.62	.63														
5. EXTERN1	.16	.36	.46	.37													
6. INTERN2	.21	.55	.60	.71	.22												
7. CDI2	.22	.54	.74	.56	.35	.79											
8. ANX2	.15	.48	.61	.56	.33	.71	.83										
9. EXTERN2	.16	.40	.57	.47	.45	.59	.74	.64									
10. INTERN3	.17	.50	.57	.51	.27	.59	.61	.53	.47								
11. CDI3	.17	.50	.67	.55	.30	.58	.69	.57	.51	.83							
12. ANX3	.13	.51	.58	.58	.29	.56	.63	.57	.49	.85	.87						
13. EXTERN3	.09	.29	.36	.29	.40	.23	.37	.30	.45	.46	.53	.54					
14. INTERN4	.21	.57	.62	.56	.26	.63	.64	.50	.48	.65	.65	.62	.33				
15. CDI4	.23	.56	.70	.56	.37	.59	.68	.52	.51	.63	.70	.64	.39	.89			
16. ANX4	.17	.53	.64	.56	.27	.59	.64	.53	.47	.61	.65	.63	.30	.88	.85		
17. EXTERN4	.11	.37	.48	.38	.35	.33	.45	.34	.46	.41	.43	.41	.51	.65	.67	.63	
<i>M</i>	14.0	.75	.47	2.20	.52	.67	.45	2.2	.45	.76	.45	2.21	.47	.77	.56	2.22	.55
<i>SD</i>	5.88	.47	.32	.75	.39	.38	.34	.73	.32	.39	.34	.72	.28	.46	.48	.76	.30
Coefficient $\alpha$	.80	.67	.90	.86	.75	.63	.91	.85	.70	.72	.91	.83	.63	.58	.90	.85	.68

Note. All correlations above .10 are significant at  $p < .05$ , correlations above .16 are significant at  $p < .01$ , and correlations above .18 are significant at  $p < .001$ . RUM=Ruminative Response Styles subscale; INTERN=internalizing, general emotional distress symptoms; CDI=Children's Depression Inventory; ANX=Anxious Arousal; EXTERN=Externalizing Behaviors.

The scale has been shown to be valid and possess moderate internal consistency (Abela et al., 2002). It was given at Time 1.

## RESULTS

### Preliminary Analyses

Descriptive statistics and intercorrelations for the main variables are presented in Table 1. The baseline measure of rumination was moderately associated with depressive and internalizing but only weakly with anxious arousal and externalizing symptoms both concurrently and prospectively at different waves of data. The different psychopathological symptoms (i.e., depressive, anxious arousal, internalizing, and externalizing) were associated with the other co-occurring symptoms concurrently and prospectively across waves of data as expected. Using the different recommended clinical cut-offs for the CDI revealed that 24.3% (CDI cutoff > 19; Stark & Laurent, 2001) or 32.3% (CDI cutoff > 16; Timbremont, Braet, & Dreesen, 2004) of youth were above cut-scores for the CDI. Similarly, for the SDQ, 12.3% of youth were above cut-scores (Goodman, 2001) for the internalizing scale and 15.1% for the conduct factor of the SDQ.

As an initial test of symptom specificity, partial correlations were used to examine the unique *cross-sectional*

associations (based on Time 1 assessment) between rumination and other symptoms when certain symptoms were controlled (see Muris et al., 2004, for evidence with their cross-sectional design). When depressive symptoms were partialled, only general internalizing symptoms related to rumination ( $r = .25$ ,  $p < .001$ ;  $r = .05$  for anxious arousal,  $r = .02$  for externalizing behaviors). When internalizing symptoms were partialled, no significant correlations between rumination and symptoms remained ( $r = .09$ ,  $p = .09$  for depression;  $r = .00$  for anxious arousal,  $r = .03$  for externalizing behaviors). Finally, rumination was related to depressive and general internalizing symptoms when anxious arousal ( $r = .31$  for internalizing;  $r = .22$  for depression,  $r = .09$ , *ns*, for externalizing behaviors) and externalizing behaviors ( $r = .35$  for internalizing;  $r = .27$  for depression,  $r = .19$  for anxious arousal) were partialled.

A between-subjects *t* test showed that there was a significant sex difference in rumination levels,  $t(348) = 4.03$ ,  $p < .001$ . Girls ( $M = 14.40$ ,  $SD = .26$ ) exhibited higher levels of rumination than boys ( $M = 12.84$ ,  $SD = .28$ ). This sex difference in rumination remained after controlling for T1 depressive symptoms,  $t(347) = 4.92$ ,  $p < .001$ . A repeated-measures analysis of variance also showed main effects for sex and Sex  $\times$  Time interactions across time. For main effect of sex, girls ( $M = .54$ ,  $SD = .025$ ) exhibited higher depressive symptoms than boys ( $M = .41$ ,  $SD = .027$ ),  $F(1, 347) = 12.53$ ,  $p < .001$ ; higher anxious arousal symptoms (girls,  $M = 2.25$ ,

$SD = .81$ ; boys,  $M = 2.08$ ,  $SD = .59$ ),  $F(1, 347) = 13.86$ ,  $p < .001$ ; higher internalizing symptoms (girls,  $M = .84$ ,  $SD = .46$ ; boys,  $M = .62$ ,  $SD = .34$ ),  $F(1, 347) = 35.61$ ,  $p < .001$ ; whereas boys exhibited higher conduct problems (girls,  $M = .46$ ,  $SD = .29$ ; boys,  $M = .53$ ,  $SD = .29$ ),  $F(1, 347) = 4.52$ ,  $p < .05$ . Significant Sex  $\times$  Time interactions were seen such that girls exhibited greater increases in depressive,  $F(3, 1044) = 14.33$ ,  $p < .001$ , and anxious arousal,  $F(3, 1044) = 8.76$ ,  $p < .001$ , symptoms but not internalizing symptoms,  $F(3, 1044) = 1.15$ , *ns*, or conduct problems,  $F(3, 1044) = 2.82$ , *ns*.

In addition, age was negatively associated with rumination ( $r = -.20$ ,  $p < .001$ ). The Age  $\times$  Sex interaction was not significant ( $F = .43$ ). There were no ethnic differences on main variables, and no higher order ethnicity interactions. Finally, youths' socioeconomic status (parental education and work) was not associated with rumination or symptoms at any time point.

### Overview of Statistical Approach

Hierarchical linear modeling (HLM 5.04; Raudenbush, Bryk, Cheong, & Congdon, 2001) was used to address the primary hypotheses: Does baseline rumination predict depressive and general internalizing symptoms over time, and does initial rumination predict depressive and general internalizing symptoms relatively more specifically compared with specific anxious arousal or externalizing symptoms? The analysis of multiple levels of data is accomplished in HLM by constructing Level 1 and 2 equations. At Level 1, regression equations are constructed that model separately the variation in the repeated measures (e.g., depressive symptoms) as a function of time (i.e., the four waves of data). Each equation includes various parameters to capture features of an individual youth's level of symptoms (e.g., depression or externalizing) over time, such as an *intercept* that describes an individual's average level on the variable across time, a *slope* that describes an individual's average amount of linear change on the variable across time, and a *time-varying covariate* that describes the strength of association between within-person fluctuations in one construct (e.g., symptoms of depression) and within-individual changes in another construct (e.g., anxiety symptoms) over the four waves of data. At Level 2, the between-subjects' variable (i.e., rumination) is used to capture individual differences in the Level 1 parameters. A significant advantage of HLM is that it can flexibly handle cases with missing data, so participants with missing data are not eliminated from the data set.

To test whether rumination predicts prospective elevations in a particular type of symptoms (e.g., depression) over time, baseline symptom levels were entered first. This enables a strong test of RST's

vulnerability hypothesis because the overlap of baseline symptoms with rumination is controlled and prospective elevations in symptoms can be examined beyond the main effects of initial symptoms. This is especially important because the best predictor of future symptoms is past symptoms, and the continuity in symptom levels over time during adolescence is very strong (cf. Tram & Cole, 2006). Thus, this data analytic approach is a conservative and risky test of hypotheses and differentiates rumination as cause, correlate, or consequence of symptoms over time (Kraemer et al., 2001) because overlapping variance between rumination and symptoms is removed by entering baseline symptoms and enables examination of prospective changes in symptoms over time.

### Rumination and Associations with Emotional Distress Symptoms Over Time

Results of these HLM analyses are presented in Table 2 for the various models predicting different symptoms as outcomes as a function of baseline rumination. As seen in Table 2, several significant results emerged across all symptom outcomes examined. First, baseline levels of a particular symptom strongly predicted average levels over time in that symptom. Second, the main effect of baseline rumination predicted prospective fluctuations (i.e., intercepts—average levels over time—after controlling for baseline symptom levels) for depressive and internalizing symptoms, but rumination only predicted slopes for internalizing symptoms over time. Third, with respect to the hypothesis of symptom specificity, baseline rumination was not significantly associated with intercepts or slopes of anxious arousal or externalizing symptoms. The relative magnitude of the relations of rumination with depressive and internalizing symptoms versus the other symptoms was conducted to evaluate further symptom specificity. Using equations to compare correlated correlation coefficients (see Meng, Rosenthal, & Rubin, 1992, p. 173, equation 5), results showed that rumination was more specifically associated with depressive and internalizing problems than anxious arousal and externalizing problems,  $\chi^2(3) = 12.378$ ,  $p < .01$ . In sum, baseline rumination predicted prospective fluctuations of depressive and general internalizing symptoms and increasing trajectories of general internalizing symptoms over time but was not related to average levels or prospective slopes in specific anxious arousal or externalizing symptoms.

To illustrate the main effect of rumination on symptom levels over time, the findings from the models were used to calculate predicted scores in depressive and general internalizing symptoms for youth with high or low levels of rumination (plus or minus 1.5 standard deviation on the RSQ). These results, shown in

TABLE 2  
Baseline Rumination Predicting Prospective Trajectories of Symptoms of Depression, Anxious Arousal, Internalizing, and Externalizing Behaviors

Predictor	Intercept				Slope			
	<i>b</i>	<i>SE</i>	<i>t</i>	<i>df</i>	<i>b</i>	<i>SE</i>	<i>t</i>	<i>df</i>
Depressive symptoms								
CDI1	.30	.02	11.24	1.347***	.09	.03	2.81	1.347**
RUM1	.004	.002	1.92	1.347*	.001	.003	.58	1.347
Anxious arousal symptoms								
ANX1	.71	.06	11.46	1.347***	.05	.07	.66	1.347
RUM1	.002	.005	.49	1.347	.005	.006	.80	1.347
Externalizing symptoms								
SDQ—EXTERN1	.27	.04	7.26	1.347***	.05	.04	1.27	1.347
RUM1	.001	.002	.60	1.347	-.004	.003	-1.13	1.347
General internalizing symptoms								
SDQ—INTERN1	.45	.03	13.55	1.347***	.16	.03	4.87	1.347***
RUM1	.01	.002	3.72	1.347***	.01	.003	3.49	1.347***

Note. RUM = Ruminative Response Scale; CDI = Children's Depression Inventory; ANX = Anxious Arousal; SDQ = Strengths and Difficulties Questionnaire; INTERN = internalizing, general emotional distress symptoms; EXTERN = Externalizing Behaviors.

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

Figure 1, indicate that high ruminators exhibited greater depressive symptoms (top panel) compared with low ruminators at baseline and over time, although the slope of the depressive symptoms trajectory did not significantly differ over time by rumination level (i.e., significant effect for intercept, non-significant slope). For

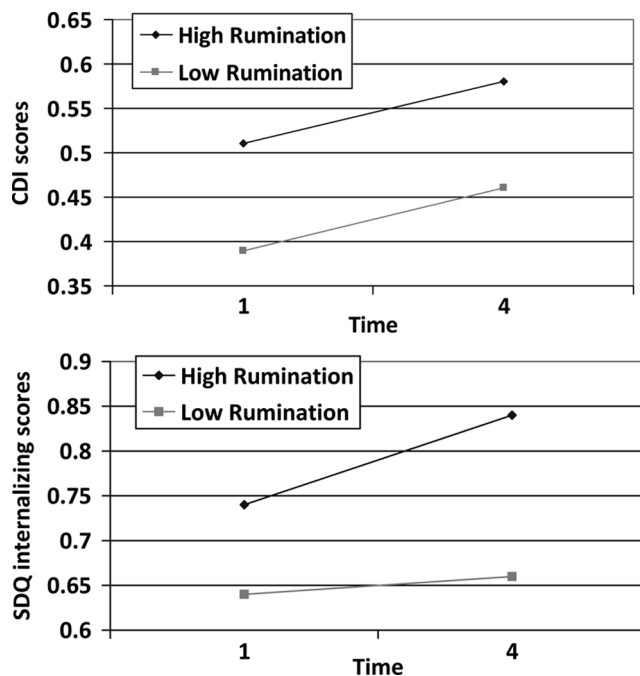


FIGURE 1 Baseline rumination ( $\pm 1$  SD from mean) predicting prospective fluctuations in depressive symptoms (top) and general internalizing symptoms (bottom) after controlling for Time 1 symptoms. Note. CDI = Children's Depression Inventory; SDQ = Strengths and Difficulties Questionnaire.

general internalizing symptoms (Figure 1, bottom), high ruminators exhibited more emotional symptoms on average across time and these trajectories became higher over time compared with low ruminators.

Finally, given the strong co-occurrence of depressive (and general internalizing emotional symptoms) with anxious arousal and externalizing symptoms and the multiwave design of the study, an exploratory set of analyses was conducted to examine the hypothesis that baseline rumination might moderate the within-person co-occurrence between depressive (and internalizing) symptoms and anxious arousal, or externalizing symptoms, over time. Conceptually and analytically, this is analogous to investigating a vulnerability-stress hypothesis such that baseline rumination is the cognitive vulnerability and within-person, time-varying fluctuations in co-occurring symptoms (either anxious arousal or externalizing symptoms) are internal, emotional "events" that may activate, or trigger, ruminative thinking and contribute to greater elevations in depressive or general internalizing symptoms beyond the main effect of baseline rumination and co-occurring symptoms as time varying covariates. To examine this exploratory hypothesis, the "vulnerability-stress interaction" was created by cross-level interactions between rumination at Level 2 and within-youth changes in symptoms at Level 1.

Results showed that baseline rumination interacted with the time varying covariate of anxious arousal ( $b = .002$ ,  $SE = .001$ ,  $t = 2.26$ ,  $p < .05$ ) and externalizing behaviors ( $b = .01$ ,  $SE = .003$ ,  $t = 3.44$ ,  $p < .01$ ) to predict prospective fluctuations in depressive symptoms above and beyond the main effects of baseline depression, rumination, and co-occurring symptoms



over time. With respect to general internalizing symptoms, baseline rumination interacted with the time varying covariate of externalizing behaviors ( $b = .01$ ,  $SE = .004$ ,  $t = 2.63$ ,  $p < .01$ ), but not anxious arousal ( $b = .002$ ,  $SE = .001$ ,  $t = 1.78$ ,  $p = .08$ ) symptoms, to predict prospective fluctuations in internalizing symptoms. Finally, the reverse direction of moderation, in which depressive or general internalizing symptoms was the time-varying covariate and anxiety or general externalizing problems was the outcome variable, showed that the cross-level interaction between rumination and depressive, or internalizing symptoms, did not significantly predict either anxious arousal or externalizing problems over time. Thus, these results suggest additional symptom specificity such that baseline rumination interacted only with within-person symptoms of anxious arousal and externalizing problems to predict fluctuations in depressive and internalizing symptoms.

To examine the form of the significant cross-level interactions between rumination and anxious and externalizing symptoms over time predicting depressive symptom elevations over time, the findings from the models were used to calculate predicted scores in depressive symptoms for youth with high or low levels of rumination (plus or minus 1.5 standard deviation on the RSQ) and those who experienced either low or high symptoms levels over time (plus or minus 1.5 standard deviation on the MASQ and SDQ—externalizing, respectively across the four data waves). These results are shown in Figure 2 for Rumination  $\times$  Anxious Arousal (top panel) and Rumination  $\times$  Externalizing (bottom panel) interactions predicting depressive symptoms. Greater rumination combined with higher co-occurring symptom levels over time predicted the greatest elevations in depressive symptoms over time. The same pattern, as seen in Figure 2 (bottom panel) was found for general internalizing symptoms as a function of Rumination  $\times$  Externalizing Symptoms.

#### Rumination and Associations with Symptoms: Age, Sex, or Ethnicity Effects?

Given well-known age and sex effects found in depression (Hankin & Abela, 2005), exploratory analyses were conducted to examine whether age or sex moderated the association between baseline rumination and prospective symptoms just reported. Age did not moderate the association between rumination and any symptom outcomes (all  $t$ s  $< 1.5$ ). Similar analyses investigating the potential effect of sex (including the main effect of sex and the interaction of Sex  $\times$  Rumination) similarly revealed nonsignificant sex moderation for all symptoms (all  $t$ s  $< 1.5$ ). Finally, ethnicity was included as a moderator (in one model as White and non-White to maximize power, and in a second

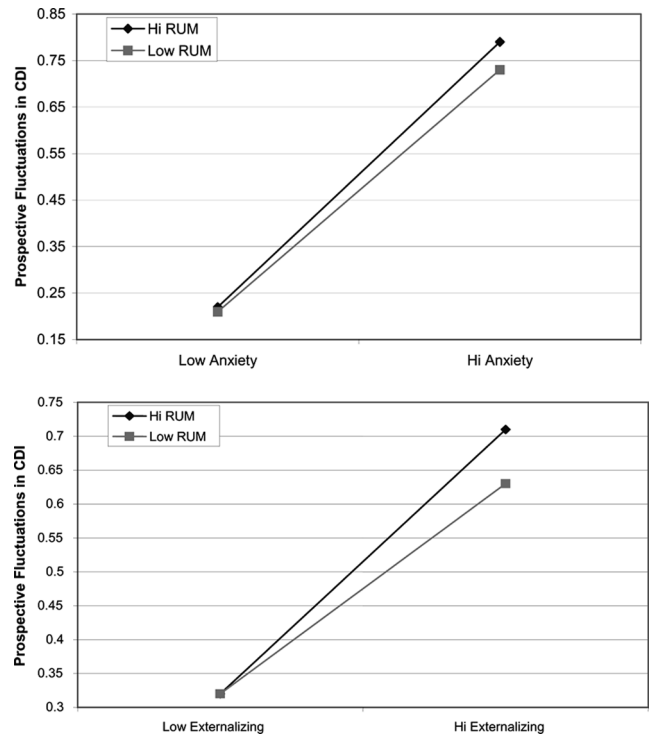


FIGURE 2 Interaction of baseline rumination by within-youth fluctuations in anxious arousal (top) and externalizing symptoms (bottom) over time predicting prospective fluctuations in depressive symptoms after controlling for Time 1 depressive symptoms. *Note.* CDI = Children's Depression Inventory; SDQ = Strengths and Difficulties Questionnaire.

model each ethnicity was included), and no significant interaction was observed in any analyses. Thus, these results suggest that the basic rumination—depressive and internalizing association does not vary by age, sex, or ethnicity.

Last, mediation analyses were conducted to evaluate whether rumination mediated girls' elevated levels of depressive and internalizing symptoms (Holmbeck, 2002). The first two conditions for mediation—the sex difference in symptoms and rumination—were already met, so the final step, that rumination predicts symptoms and the sex difference in symptoms is reduced, was examined. HLM, in which sex and rumination were entered at Level 2, showed that rumination partially mediated the sex difference in depressive and internalizing symptoms. For depressive symptoms, rumination predicted symptom elevations ( $b = .013$ ,  $SE = .002$ ,  $t = 5.03$ ,  $p < .001$ ), and the effect of sex was diminished but significant ( $b = .08$ ,  $SE = .03$ ,  $t = 2.53$ ,  $p < .01$ ; from  $b = .11$ ,  $SE = .03$ ,  $t = 3.2$ ,  $p < .01$ ). For internalizing symptoms, rumination predicted symptom elevations ( $b = .025$ ,  $SE = .002$ ,  $t = 8.17$ ,  $p < .001$ ), and the sex effect was reduced but significant ( $b = .14$ ,  $SE = .03$ ,  $t = 3.59$ ,  $p < .01$ ; from  $b = .15$ ,  $SE = .01$ ,  $t = 4.1$ ,  $p < .001$ ). The Sobel test was significant for depressive

symptoms ( $z = 3.13$ ,  $p < .001$ ) and internalizing symptoms ( $z = 3.61$ ,  $p < .001$ ). Rumination explained 27% of the association between sex and depression and 7% for internalizing symptoms.

## DISCUSSION

It is important to predict prospective elevations in depressive and internalizing symptoms during adolescence because the prevalence of depressive disorders increases (Hankin et al., 1998), symptoms stabilize (Tram & Cole, 2006), and adolescent-onset depression is more likely to recur in adulthood (Rutter, Kim-Cohen, & Maughan, 2006). Thus, studying etiological risk factors for depression and their affective specificity during adolescence can advance knowledge on depression onset, maintenance, and co-occurrence with other syndromes. This study examined rumination as one etiological factor.

Four main sets of findings emerged from this study. First, baseline rumination predicted prospective fluctuations of symptoms of depression and general internalizing problems and prospective trajectories in internalizing symptoms over time. Second is that symptom specificity to depression was found. Rumination was not associated with fluctuations or slopes in anxious arousal or externalizing problems. Third, baseline rumination interacted with co-occurring anxious arousal and externalizing symptoms to predict within-youth fluctuations in depressive symptoms over time; rumination interacted with externalizing behaviors to predict within-youth fluctuations in general internalizing symptoms. Finally, girls reported more use of rumination as a response style compared to boys, and rumination partially mediated the sex difference in depressive and internalizing symptoms. Sex did not moderate the associations between rumination and later symptoms.

### Rumination Predicted Prospective Changes in Depressive and Internalizing Symptoms Specifically

By assessing symptoms at multiple time points, this study was able to address whether baseline rumination predicted prospective fluctuations in symptoms over time as well as prospective trajectories in symptoms. Rumination predicted prospective slopes (i.e., trajectories) in internalizing symptoms and fluctuations of depressive and internalizing symptoms over time. By controlling for baseline levels of symptoms in the analyses, predicting intercepts of depressive and general internalizing symptoms means that prospective changes in the average level of these symptoms over time were predicted by baseline rumination. This can be seen clearly in Figure 1: High ruminating youth, compared

with low ruminators, exhibited higher depressive symptoms at baseline and in average levels over time. Baseline rumination did not predict trajectories in depressive symptoms over time, and this nonsignificant slope effect is seen in Figure 1 in that both high and low ruminators showed similar growth trajectories in depressive symptoms over time. In addition, baseline rumination predicted both prospective changes (i.e., intercepts) as well as trajectories (i.e., slopes) in general internalizing symptoms. High ruminating youth exhibited greater average levels of general internalizing symptoms as well as greater growth in these symptoms over time compared to low ruminators, who showed little change in general internalizing symptoms over time.

Past prospective research with youth examining rumination as a predictor of changes in symptoms (e.g., Abela et al., 2002; Abela et al., 2004; Broderick & Korteland, 2004; Burwell & Shirk, 2007; Schwartz & Koenig, 1996) used two-time-point designs. With this design, it is not possible to separate and analyze intercept and slope differently, as multiwave designs are required to model prospective changes in the form of intercept and slopes separately (Curran & Willoughby, 2003). The finding from the study presented here that baseline rumination predicted intercepts for depressive and general internalizing symptoms, after controlling for baseline symptom levels, appears consistent with the results from these prior two-time-point studies and suggests that rumination predicts prospective changes in depressive and general internalizing symptoms over time. However, the past research using a two-time-point design was not able to examine the form of change over time (i.e., averages over time vs. trajectories) and how rumination predicts these different aspects of change in symptoms over time. The present study, thus, adds to the literature by suggesting that rumination predicts prospective fluctuations in depressive and general internalizing symptoms over time and increasing trajectories of general internalizing symptoms. In sum, the evidence accumulated across studies with different age groups supports the role of rumination as contributing prospectively to emotional distress symptoms.

Still, rumination predicted increasing prospective trajectories of only internalizing, but not depressive, symptoms over time. One might expect, based on RST, that increasing slopes would be stronger for depressive, rather than general internalizing, symptoms. Clearly, additional research with multiwave designs and youth of different ages is needed to replicate these findings. Pending replication, it is speculated that rumination may have a stronger effect on the developmental trajectories of broad negative affect, which is largely equivalent to the general internalizing symptoms assessed via the SDQ—emotional problems scale (i.e., both anxiety and depressive symptoms) in this study.

Hierarchical models of the internalizing disorders spectrum (e.g., Watson, 2005) suggest that broad negative affect is the common element across the internalizing disorders at the top of the hierarchy, and this can be decomposed into “distress” disorders (e.g., depression, social phobia, generalized anxiety disorder) and “fear” disorders (e.g., separation anxiety disorder, phobias) at the next level of the hierarchy (Lahey, Applegate, Waldman, Hankin, & Rick, 2004). The SDQ—emotional problems measure represents the broad negative affect component of this hierarchical model, and general depressive symptoms (the CDI) and anxious arousal were chosen to represent the “distress” and “fear” aspects of the model in order to examine how rumination relates with these different aspects of internalizing problems. The CDI is known to assess features of both depression and general negative affect (e.g., Chorpita, Albano, & Barlow, 1998), so the fact that rumination predicted prospective fluctuations in CDI scores over time needs to be considered and interpreted within the theoretical context of this hierarchical model of internalizing spectrum disorders. By assessing these various aspects of emotional distress, including depressive, specific anxious arousal, and general internalizing, the findings add new knowledge on the specific role that rumination plays in contributing to the various components in the hierarchical internalizing spectrum.

The scant past research with youth and adults that has examined different aspects of the internalizing spectrum has similarly suggested that rumination may be more strongly associated with broad negative affect rather than depression more specifically. Nolen-Hoeksema and colleagues (2007) found that rumination was associated with depressive, substance use problems, and bulimic symptoms but not externalizing symptoms in a sample of adolescent girls. Muris and colleagues (2004) found that rumination was associated with both depressive and general anxiety/worry symptoms using a cross-sectional design. The cross-sectional results from Time 1 of the present research replicated Muris and colleagues’ findings and suggest that rumination is most strongly linked with general negative affect. Likewise Nolen-Hoeksema (2000) in an adult sample showed that rumination more strongly predicted mixed anxiety-depressive disorder, which is likely mostly comprised of negative affect, compared with pure clinical depression. Thus the evidence from the present study, in combination with past research, suggests that rumination may contribute mostly to symptoms that involve components of general negative affect, such as depression, worry, bulimic symptoms, substance use problems, and general internalizing problems, whereas rumination may not significantly contribute to other forms of emotional distress that do not contain strong negative affective aspects, such as externalizing behaviors

or anxious arousal. Still, relatively little research has examined specificity of rumination predicting various forms of emotional distress (Abela & Hankin, 2007; Seligman & Ollendick, 1998), so additional research is warranted to continue to examine specificity to different levels and aspects of the internalizing spectrum.

#### Rumination Interacted With Co-Occurring Anxious Arousal and Externalizing Symptoms to Predict Prospective Elevations of Depressive Symptoms

The multiwave design of the study in which multiple forms of emotional distress were assessed repeatedly over time enabled an examination of the exploratory hypothesis that a ruminative response style might interact with co-occurring symptoms of anxious arousal and externalizing problems over time to predict elevations in depressive and general internalizing symptoms over time. This hypothesis was based on the idea that rumination is an emotion-focused form of maladaptive coping. RST postulates that individuals with a ruminative response style tend to focus repetitively on the meaning, causes, and consequences of emotional distress, and that when in a negative mood, individuals’ negative affect, especially depression, will be maintained and worsen over time. It was reasoned that youth with a high ruminative response style might excessively focus on and attend to their symptoms of anxious arousal and externalizing behaviors and ruminate about the causes, consequences, and meaning of these symptoms for their self. Consistent with a vulnerability–stress theoretical framework, then, individuals’ anxious arousal symptoms and externalizing behaviors might function as emotional symptom “events” that could interact with rumination as a cognitive vulnerability.

Results supported this exploratory hypothesis and provide a novel addition to the field’s understanding on the role that rumination plays in contributing to depressive symptoms over time. Specifically, baseline rumination interacted with prospective, co-occurring fluctuations in anxious arousal and externalizing symptoms to predict elevations in depressive symptoms, and the Rumination  $\times$  Externalizing symptoms interaction predicted greater internalizing symptoms. As this set of findings is new, it will be important for future research to replicate the results. It is speculated that elevations in psychopathological symptoms may act as internal “events” that activate and trigger an individual’s ruminative responses. As the youth repetitively ruminates about aspects of these symptoms and problem behaviors, the person experiences more negative affect because attention and focus is directed internally (cf. Ingram, 1990) on the meaning, consequences, and causes of the symptoms rather than on efforts to cope effectively, problem solve, or distract. In other words, symptom elevations may provide “grist

for the ruminative mill”: Once ruminative response tendencies are activated, the person experiences elevations in negative affect.

### Strengths and Limitations

The findings from this research should be interpreted with particular limitations of the study in mind. First, the data on symptoms and rumination were all self-reported by the youth. Replication of these results with multiple methods (e.g., experimental methods including induction of rumination or attentional switching tasks; Wilkinson & Goodyer, 2006) and multiple informants (e.g., parents, teachers) should be undertaken. Second, diagnostic clinical levels of anxiety, depression, and externalizing problems were not assessed in this study with structured diagnostic interviews, so it is unknown whether the symptom specificity results will generalize to these problems at the disorder level. Research examining the continuity of these psychopathologies suggests that anxiety, depression, and externalizing problems are represented and conceptualized best as dimensional continua, rather than discrete categories (e.g., Hankin, Fraley, Lahey, & Waldman, 2005; Vollebergh et al., 2001). Use of structured diagnostic interviews in future research can address this issue. Third, this study did not assess nor test for etiologically specific risk factors for anxiety or externalizing problems. Specific vulnerabilities to these other forms of psychopathology should be examined in the future. For example, behavioral inhibition or anxiety sensitivity could be included for anxiety symptoms, and a hostile attributional bias or peer deviancy could be examined for conduct problems. Finally, the spacing of the prospective intervals (i.e., every 5 weeks) was fairly close in time, so the study provided results over a relatively short time period, albeit consistent with the time frames used in most past work (5–10 weeks). Future multiwave research can build on these findings and investigate longer time spans between intervals.

On the other hand, several strengths of the study enhance confidence in the findings. First, the design involved a multiwave assessment of various commonly occurring psychopathological symptoms. Second, the prospective design enabled stronger inferences about the temporal precedence between rumination and emotional distress symptoms and rules out rumination as a mere correlate of prospective emotional distress, although conclusions with respect to rumination as cause of future emotional distress cannot be made (Kraemer et al., 2001), nor can rumination as a consequence of emotional distress be disregarded given theory and evidence on their likely reciprocal association (Nolen-Hoeksema et al., 2007). Third, data analytic methods best suited for multiwave longitudinal repeated measures data were used. Fourth, the sample of early

and middle adolescents was modestly large, so there was sufficient power to detect even small effect sizes. Last, the community-based sample was relatively racially and ethnically diverse and represented a wide socioeconomic range, as opposed to predominantly White, middle-class samples used in most past research.

### Implications for Research, Policy, and Practice

A few potential implications of these results are noted. For practice, the findings implicate rumination as an important factor contributing to prospective increases in emotional distress symptoms. Thus, assessing and trying to reduce youths’ ruminative response styles can be important for understanding and reducing risk for emotional distress. This may be especially true for girls given the study’s findings that girls exhibited higher levels of rumination than boys and rumination partially explained why girls report more depressive and internalizing symptoms. Rumination related to elevations of depressive and internalizing symptoms equally for boys and girls (i.e., no moderation by sex). Given the emergence of the sex difference in depression starting in early adolescence and becoming more prominent throughout adolescence and adulthood (Hankin, Wetter, & Cheely, 2007), RST may potentially explain the development of the sex difference in depression (Hankin & Abramson, 2001; Nolen-Hoeksema & Girgus, 1994) and may inform practice and policy to reduce the burden of depression, especially among adolescent girls.

In sum, results from this multiwave prospective study of early and middle adolescents showed that baseline rumination was related specifically to depressive and general internalizing symptoms but not co-occurring anxious arousal or externalizing symptoms. In addition, rumination interacted with prospective elevations of these co-occurring anxious arousal and externalizing symptoms to predict within-youth fluctuations in levels of depressive symptoms. These findings advance knowledge on the role that rumination, as an emotion-focused self-regulatory process, plays in youths’ coping with symptoms of emotional distress over time and the affectivity symptom specificity of rumination.

### REFERENCES

- Abela, J. R. Z., Brozina, K., & Haigh, E. P. (2002). An examination of the response styles theory of depression in third and seventh grade children: A short-term longitudinal study. *Journal of Abnormal Child Psychology, 30*, 515–527.
- Abela, J. R. Z., & Hankin, B. L. (2007). Cognitive vulnerability to depression in children and adolescence: A developmental psychopathology approach. In J. R. Z. Abela & B. L. Hankin (Eds.), *Handbook of child and adolescent depression* (pp. 35–78). New York: Guilford.

- Abela, J. R. Z., Vanderbilt, E., & Rochon, A. (2004). A test of the integration of the response styles and social support theories of depression in third and seventh grade children. *Journal of Social and Clinical Psychology, 23*, 653–674.
- Albano, A. M., Chorpita, B. F., & Barlow, D. (2003). Childhood anxiety disorders. In E. J. Mash & R. A. Barkley (Eds.), *Child psychopathology* (2nd ed., pp. 279–329). New York: Guilford.
- Angold, A., Costello, E. J., & Erkanli, A. (1999). Comorbidity. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 40*, 57–87.
- Avenevoli, S., Stolar, M., Li, J., Dierker, L., & Merikangas, K. (2001). Comorbidity of depression in children and adolescents: Models and evidence from a prospective high-risk family study. *Biological Psychiatry, 49*, 1071–1081.
- Birmaher, B., Ryan, N. D., Williamson, D. E., Brent, D. A., Kaufman, J., Dahl, R. E., et al. (1996). Childhood and adolescent depression: A review of the past 10 years. Part I. *Journal of American Academy of Child and Adolescent Psychiatry, 35*, 1427–1439.
- Broderick, P. C., & Korteland, C. (2004). A prospective study of rumination and depression in early adolescence. *Clinical Child Psychiatry and Psychology, 9*, 383–394.
- Brown, T. A., Chorpita, B. F., & Barlow, D. H. (1998). Structural relationships among dimensions of the *DSM-IV* anxiety and mood disorders and dimensions of negative affect, positive affect, and autonomic arousal. *Journal of Abnormal Psychology, 102*, 179–192.
- Burwell, R. A., & Shirk, S. R. (2007). Subtypes of rumination in adolescence: Associations between brooding, reflection, depressive symptoms, and coping. *Journal of Child and Adolescent Clinical Psychology, 36*, 56–65.
- Chorpita, B. F., Albano, A. M., & Barlow, D. H. (1998). The structure of negative emotions in a clinical sample of children and adolescents. *Journal of Abnormal Psychology, 107*, 74–85.
- Ciesla, J. A., & Roberts, J. E. (2002). Self-directed thought and response to treatment for depression: A preliminary investigation. *Journal of Cognitive Psychotherapy, 16*, 435–453.
- Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology, 100*, 316–336.
- Costello, E. J., Erkanli, A., & Angold, A. (2006). Is there an epidemic of child or adolescent depression? *Journal of Child Psychology and Psychiatry, 47*, 1263–1271.
- Curran, P. J., & Willoughby, M. T. (2003). Implications of latent trajectory models for the study of developmental psychopathology. *Development and Psychopathology, 15*(3), 581–612.
- Fenigstein, A., Scheier, M. F., & Buss, A. H. (1975). Public and private self-consciousness: Assessment and theory. *Journal of Consulting and Clinical Psychology, 43*, 522–527.
- Garber, J. (2000). Development and depression. In A. J. Sameroff, M. Lewis, & S. M. Miller (Eds.), *Handbook of developmental psychopathology* (2nd ed., pp. 467–490). New York: Kluwer Academic/Plenum.
- Goodman, R. (2001). Psychometric properties of the Strengths and Difficulties Questionnaire (SDQ). *Journal of the American Academy of Child and Adolescent Psychiatry, 40*, 1337–1345.
- Hankin, B. L., & Abela, J. R. Z. (2004). Depression from childhood through adolescence and adulthood: A developmental vulnerability-stress perspective. In B. L. Hankin & J. R. Z. Abela (Eds.), *Development of psychopathology: A vulnerability-stress perspective* (pp. 245–288). Thousand Oaks, CA: Sage.
- Hankin, B. L., & Abramson, L. Y. (2001). Development of gender differences in depression: An elaborated cognitive vulnerability-transactional stress theory. *Psychological Bulletin, 127*, 773–796.
- Hankin, B. L., Abramson, L. Y., Moffitt, T. E., McGee, R., Silva, P. A., & Angell, K. E. (1998). Development of depression from preadolescence to young adulthood: Emerging gender differences in a 10-year longitudinal study. *Journal of Abnormal Psychology, 107*, 128–140.
- Hankin, B. L., Abramson, L. Y., & Siler, M. (2001). A prospective test of the hopelessness theory of depression in adolescence. *Cognitive Therapy and Research, 25*, 607–632.
- Hankin, B. L., Wetter, E., & Cheely, C. (2007). Sex differences in child and adolescent depression: A developmental psychopathological approach. In J. R. Z. Abela & B. L. Hankin (Eds.), *Handbook of child and adolescent depression* (pp. 377–414). New York: Guilford.
- Hankin, B. L., Fraley, R. C., Lahey, B. B., & Waldman, I. (2005). Is youth depressive disorder best viewed as a continuum or discrete category? A taxometric analysis of childhood and adolescent depression in a population-based sample. *Journal of Abnormal Psychology, 114*, 96–110.
- Hankin, B. L., Wetter, E., Cheely, C., & Oppenheimer, C. (in press). Beck's cognitive theory of depression in adolescence: Prospective prediction of depressive symptoms and transactional influences in a multi-wave study. *International Journal of Cognitive Therapy*.
- Hinshaw, S. P., & Lee, S. P. (2003). Conduct and oppositional defiant disorders. In E. J. Mash & R. A. Barkley (Eds.), *Child psychopathology* (2nd ed., pp. 144–198). New York: Guilford.
- Holmbeck, G. (2002). Post-hoc probing of significant moderational and mediational effects in studies of pediatric populations. *Journal of Pediatric Psychology, 27*, 87–96.
- Hull, J. G., Levenson, R. W., Young, R. D., & Sher, K. (1983). Self-awareness reducing effects of alcohol consumption. *Journal of Personality and Social Psychology, 44*, 461–473.
- Ingram, R. E. (1990). Self-focused attention in clinical disorders: Review and a conceptual model. *Psychological Bulletin, 107*, 156–176.
- Kim-Cohen, J., Caspi, A., Moffitt, T. E., Harrington, H., Milne, B. J., & Poulton, R. (2003). Prior juvenile diagnoses in adults with mental disorder: Developmental follow-back of a prospective-longitudinal cohort. *Archives of General Psychiatry, 60*, 709–717.
- Klein, D. N., Dougherty, L. R., & Olino, T. M. (2005). Toward guidelines for evidence-based assessment of depression in children and adolescents. *Journal of Clinical Child and Adolescent Psychology, 34*, 412–432.
- Kovacs, M. (1981). Rating scales to assess depression in school children. *Acta Paedopsychiatrica, 46*, 305–315.
- Kovacs, M. (2001). *Children's Depression Inventory manual*. North Tonawanda, NY: Multi-Health Systems.
- Kraemer, H. C., Stice, E., Kazdin, A., Offord, D., & Kupfer, K. (2001). How do risk factors work together? Mediators, moderators, independent, overlapping and proxy risk factors. *American Journal of Psychiatry, 158*, 848–856.
- Lahey, B. B., Applegate, B., Waldman, I., Hankin, B. L., & Rick, J. (2004). The Structure of Child and Adolescent Psychopathology: Generating New Hypotheses. *Journal of Abnormal Psychology, 113*, 358–385.
- Lakdawalla, Z., Hankin, B. L., & Mermelstein, R. (2007). Cognitive theories of depression in children and adolescents: A conceptual and quantitative review. *Child Clinical and Family Psychology Review, 10*, 1–24.
- Lonigan, C. J., Phillips, B. M., & Hooe, E. S. (2003). Relations of positive and negative affectivity to anxiety and depression in children: Evidence from a latent variable longitudinal study. *Journal of Consulting and Clinical Psychology, 71*, 465–481.
- Lyubomirsky, S., & Tkach, C. (2004). The consequences of dysphoric rumination. In C. Papageorgiou & A. Wells (Eds.), *Depression rumination: Nature, theory and treatment* (pp. 21–42). New York: Wiley.
- Meng, X. L., Rosenthal, R., & Rubin, D. B. (1992). Comparing correlated correlation coefficients. *Psychological Bulletin, 111*, 172–175.

- Muris, P., Roelofs, J., & Meesters, C. (2004). Rumination and worry in nonclinical adolescents. *Cognitive Therapy and Research, 28*, 539–554.
- Newman, D. L., Moffitt, T. E., Caspi, A., & Silva, P. A. (1998). Comorbid mental disorders: Implications for treatment and sample selection. *Journal of Abnormal Psychology, 107*, 305–311.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology, 100*, 569–582.
- Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology, 109*, 504–511.
- Nolen-Hoeksema, S., & Girgus, J.S. (1994). The emergence of gender differences in depression during adolescence. *Psychological Bulletin, 115*, 424–443.
- Nolen-Hoeksema, S., & Jackson, B. (2001). Mediators of the gender difference in rumination. *Psychology of Women Quarterly, 25*, 37–47.
- Nolen-Hoeksema, S., Larson, J., & Grayson, C. (1999). Explaining the gender difference in depressive symptoms. *Journal of Personality and Social Psychology, 77*, 1061–1072.
- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology, 61*, 115–121.
- Nolen-Hoeksema, S., Stice, E., Wade, E., & Bohon, C. (2007). Reciprocal relations between rumination and bulimic, substance abuse, and depressive symptoms in female adolescents. *Journal of Abnormal Psychology, 116*, 198–207.
- Papageorgiou, C., & Wells, A. (2004). *Depression rumination: Nature, theory and treatment*. New York: Wiley.
- Park, R. J., Goodyer, I. M., & Teasdale, J. D. (2004). Effects of induced rumination and distraction on mood and overgeneral autobiographical memory in adolescent Major Depressive Disorder and controls. *Journal of Child Psychology and Psychiatry, 45*, 996–1006.
- Pine, D. S., Cohen, P., Gurley, D., Brook, J., & Ma, Y. (1998). The risk for early-adulthood anxiety and depressive disorders in adolescents with anxiety and depressive disorders. *Archives of General Psychiatry, 55*, 56–64.
- Raudenbush, S. W., Bryk, A., Cheong, Y. F., & Congdon, R. (2001). *Hierarchical linear and nonlinear modeling 5.04*. Lincolnwood, IL: Scientific Software International.
- Rudolph, K. D., Hammen, C., & Daley, S. E. (2006). Mood disorders. In D. A. Wolfe & E. J. Mash (Eds.), *Behavioral and emotional disorders in adolescents: Nature, assessment, and treatment* (pp. 300–342). New York: Guilford.
- Rutter, M., Kim-Cohen, J., & Maughan, B. (2006). Continuities and discontinuities in psychopathology between childhood and adult life. *Journal of Child Psychology and Psychiatry, 47*, 276–295.
- Schwartz, J. A. J., & Koenig, L. J. (1996). Response styles and negative affect among adolescents. *Cognitive Therapy and Research, 20*, 13–36.
- Seligman, L. D., & Ollendick, T. H. (1998). Comorbidity of anxiety and depression in children and adolescents: An integrative review. *Clinical Child and Family Psychology Review, 1*, 125–144.
- Smucker, M. R., Craighead, W. E., Craighead, L. W., & Green, B. J. (1986). Normative and reliability data for the Children's Depression Inventory. *Journal of Abnormal Child Psychology, 14*, 25–39.
- Stark, K. D., & Laurent, J. (2001). Joint factor analysis of the Children's Depression Inventory and the Revised Children's Manifest Anxiety Scale. *Journal of Clinical Child Psychology, 30*, 552–567.
- Thomson, D. K. (2006). The association between rumination and negative affect: A review. *Cognition and Emotion, 20*, 1216–1235.
- Timbremont, B., Braet, C., & Dreesen, L. (2004). Assessing depression in youth: relation between the Children's Depression Inventory and a structured interview. *Journal of Clinical Child and Adolescent Psychology, 33*, 149–157.
- Tram, J. M., & Cole, D. A. (2006). A multimethod examination of the stability of depressive symptoms in childhood and adolescence. *Journal of Abnormal Psychology, 115*, 674–686.
- Vollebergh, W. A. M., Iedema, J., Bijl, R. V., de Graaf, R., Smit, F., & Ormel, J. (2001). The structure and stability of common mental disorders: The NEMESIS study. *Archives of General Psychiatry, 58*, 597–603.
- Watson, D. (2005). Rethinking the mood and anxiety disorders: A quantitative hierarchical model for DSM-V. *Journal of Abnormal Psychology, 114*, 522–536.
- Watson, D., Clark, L. A., Weber, K., Assenheimer, J. S., Strauss, M. E., & McCormick, R. A. (1995). Testing a tripartite model: II. Exploring the symptom structure of anxiety and depression in student, adult, and patient samples. *Journal of Abnormal Psychology, 104*, 15–25.
- Wilkinson, P. O., & Goodyer, I. M. (2006). Attention difficulties and mood-related ruminative response style in adolescents with unipolar depression. *Journal of Child Psychology and Psychiatry, 47*, 1284–1291.
- Wyer, R. S. (1996). *Ruminative thoughts. Advance in social cognition, Vol. IX*. Mahwah, NJ: Erlbaum.
- Ziegert, D. I., & Kistner, J. A. (2002). Response styles theory: Downward extension to children. *Journal of Clinical Child and Adolescent Psychology, 31*, 325–334.