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A Vulnerability-Stress Examination of Response Styles Theory in Adolescence: Stressors, Sex Differences, and Symptom Specificity

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Abstract

Objective—The stress-reactivity extension of the response styles theory of depression suggests that individuals who ruminate (or fail to engage in distraction or problem-solving) in response to dysphoric mood are likely to experience higher levels of depression following stress. However, previous studies have not addressed (1) the specificity of these vulnerability-stress relations to symptoms of depression following different types of stressors, and (2) to what extent rumination and stress can account for the sex differences in depression that emerge during early adolescence.

Method—A community sample of 256 early adolescents (ages 12–13) completed a baseline visit and a follow-up visit nine months later. Response styles and symptoms of depression and anxiety were assessed at baseline, and intervening life events, emotional maltreatment, peer relational victimization, and symptoms of depression and anxiety were assessed at follow-up.

Results—Higher rumination and lower distraction/problem-solving interacted with several types of stressors to predict higher levels of symptoms of depression, but not anxiety. Rumination was more strongly associated with elevations in depressive symptoms following the occurrence of relational victimization events in girls than in boys. Additionally, dependent interpersonal stress mediated the sex difference in depressive symptoms that emerged at follow-up, and this indirect pathway was stronger among adolescents who tended to ruminate.

Conclusions—Rumination may confer vulnerability that is specific to symptoms of depression following recent stressors during early adolescence. Girls who ruminate may be particularly likely to experience depression following relational victimization, and dependent interpersonal stressors may help to account for girls' greater risk for depression during adolescence.

Keywords

Response Styles; Rumination; Stress Reactivity; Depression; Cognitive Vulnerability

The prevalence of depression increases dramatically during adolescence and is the period in which the sex difference in depression emerges, with girls becoming more than twice as likely as boys to experience an episode of depression (Hankin et al., 1998). Additionally, subclinical depressive and anxiety symptoms are associated with functional impairment among adolescents (González-Tejera et al., 2005) and may predict the development of major depression and anxiety disorders later in life (van Lang et al., 2007). Despite these statistics and research supporting cognitive theories of depression in adolescence, studies only recently have begun to examine the symptom specificity of cognitive factors contributing to depression (Abela & Hankin, 2008).

Response Styles Theory

The response styles theory (RST) of depression (Nolen-Hoeksema, 1991) suggests that the way in which individuals respond to their symptoms of depression determines both the severity and duration of such symptoms. Individuals with ruminative response styles tend to engage in cognitions and behaviors that passively and repetitively focus the individual's attention on his or her dysphoric mood and on understanding the causes and implications of his or her mood. Although individuals who ruminate may believe that engaging in rumination is likely to help them to adaptively cope with their distress, in reality, rumination frequently results in behavioral passivity and less engagement in adaptive problem-solving and often has ironic effects, which often intensifies and prolongs dysphoric mood (Nolen-Hoeksema, 1991). This finding has been consistently demonstrated in the literature, including among children and adolescents (for reviews, see Abela & Hankin 2008; Rood et al., 2009).

In contrast with rumination, RST suggests that individuals who engage in distraction (thoughts and behaviors that take their minds off of their dysphoric mood) or problem-solving (actively attempting to improve one's situation) when they experience dysphoric mood should experience depressive symptoms of shorter duration and milder severity (Nolen-Hoeksema, 1991). Hence, distraction and problem-solving are conceptualized as adaptive strategies of regulating one's emotions during periods of dysphoric mood. Engaging in distraction or problem-solving may allow one to switch attentional focus away from analyzing the causes and consequences of negative events or the temporary dysphoria that may follow, potentially allowing for appropriate strategies to be used to improve the outcome of the situation. Previous research among adolescents has suggested that distraction and problem-solving may be part of a unitary response style (Abela et al., 2007). Indeed, Nolen-Hoeksema (1991) suggested that one effective method for reducing dysphoric mood may be to initially distract oneself from the sad mood, and subsequently to problem-solve about how to improve the situation that caused the sad mood. In relation to rumination, previous studies of adolescents have found rumination and distraction or problem-solving to be relatively orthogonal constructs (e.g., Abela et al., 2007; Schwartz & Koenig, 1996).

RST was originally hypothesized to explain the sex difference in depression, such that women are more likely to experience depression because they ruminate more than men, whereas men are less likely to experience depression because they are more likely to distract in response to dysphoric mood (Nolen-Hoeksema, 1987). Consistent with RST, existing research has often found significant sex differences in rumination beginning in early adolescence (e.g., Jose & Brown, 2008), although little previous work has supported the notion that boys engage in distraction or problem-solving more than girls (for reviews, see Abela & Hankin, 2008; Rood et al., 2009).

Response Styles as Vulnerabilities to Depression

Although rumination was originally proposed as a predictor of depression as a main effect, recent research has evaluated rumination as a vulnerability to depression in interaction with life stress. Individuals who tend to ruminate in response to sadness may be particularly likely to ruminate following the occurrence of stressful events, in an attempt to understand their dysphoric mood (Robinson & Alloy, 2003). When ruminating in response to sadness, individuals may focus on the negative attributions they have made about the causes and consequences of precipitating events that may have led to the sadness. This process may maintain or exacerbate their dysphoric mood and may lead them to make further negative inferences about the event, while preventing them from engaging in active coping strategies to improve the situation or their feelings about it. Thus, although rumination and life events may exert independent effects on symptoms of depression, they may also work synergistically such that rumination exacerbates the impact of stress on depressed mood.

Several studies have found that adolescents who ruminate are more reactive to stress in the form of depression (Abela, Hankin, Sheshko, Fishman, & Stolow, 2012; Cox, Funasaki, Smith, & Mezulis, 2011; Hankin, 2009; Kercher & Rapee, 2009). For example, Abela and Hankin (2011) found that the rumination-stress interaction predicted the first onset of depressive episodes in adolescents. However, the literature with respect to rumination in a vulnerability-stress context is mixed, as several studies have not found that adolescents who ruminate experience higher levels of depressive symptoms following stress (Abela, Parkinson, Stolow, & Starrs, 2009; Jose & Brown, 2008; Rood, Roelofs, Bogels, & Meester, 2012; Weir & Jose, 2008). Surprisingly, despite evidence that low levels of distraction confer risk for depression (Rood et al., 2009), to our knowledge no study to date has directly evaluated low levels of distraction or problem-solving as vulnerabilities to depression in the context of life stress.

Given the inconsistencies in the literature with respect to whether rumination serves as a vulnerability to depression in the face of stress, researchers recently have called for a closer examination of how response styles may interact with particular types of stressors. One way to distinguish stressors may be by the extent to which they are dependent on the adolescent's own behavior (Hammen, 1991), with "dependent" events at least partially a result of the adolescent's characteristics or behavior (e.g., failing a test), whereas other events may be "independent" of the individual (e.g., family moving to a new city). Stressors also may be categorized by domains of particular relevance to the individual (e.g., interpersonal or achievement).

Only two studies have evaluated rumination as a vulnerability to depression in the context of different types of stress. Kercher and Rapee (2009) reported that a composite score of rumination and negative cognitive style moderated the effects of dependent stress on depressive symptoms among early adolescents, but they did not report the effects of other subtypes of stressors. Further, Cox et al. (2011) found that rumination moderated the effects of dependent, independent, and non-interpersonal stressors on depressive symptoms among mid-to-late adolescents, but that rumination did not moderate the effects of interpersonal stressors. This finding is surprising given that interpersonal stress has been strongly linked to depression among adolescents. (e.g., Rudolph et al., 2000), although this could be due to the fact that Cox et al. did not differentiate between dependent and independent interpersonal stress. Additionally, because rumination is characterized by introspective attention in response to dysphoric mood, adolescents who ruminate might be especially likely to do so when they attribute the causes of their dysphoric mood to events that are due to personal characteristics. Thus, dependent events that are interpersonal in nature may be most likely to lead to depression among adolescents who ruminate (or who fail to engage in distraction or problem-solving).

Notably, no research to date has evaluated rumination in the context of specific types of interpersonal stressors that may be particularly relevant and depressogenic during adolescence, such as relational peer victimization (PV; social exclusion, gossiping, and reputational threat), familial emotional abuse (EA; verbal assaults on self-worth by parent/caretaker) and familial emotional neglect (EN; parental/caretaker emotional unresponsiveness). These experiences are also thought to confer risk for depression via negative emotional feedback experiences in the case of PV and EN, and because depressogenic cognitions are supplied directly to the adolescent in the case of EA (Rose & Abramson, 1992). Specifically, given the importance of peer relationships during adolescence, adolescents may be particularly vulnerable to the effects of relational peer victimization. Indeed, considerable research has found that relational peer victimization confers risk for depression during this time (e.g. Prinstein, Boergers, & Vernberg, 2001). Additionally, adolescence is a period of elevated conflict within the family (Laurson, Coy, & Collins, 1998). Thus, emotional maltreatment by family members may also have damaging effects for adolescents' self-worth and may be particularly likely to lead to dysphoric mood in adolescence (Hamilton et al., 2013). Given that rumination occurs in response to dysphoric mood, interpersonal stressors that are strongly implicated in the occurrence of dysphoric mood, such as PV, EA, and EN, may be most likely to result in depression among adolescents who ruminate.

Specificity of Response Styles as Vulnerabilities to Depressive Symptoms

Although RST was originally developed to explain the course of depression, rumination also has been shown to correlate with symptoms of anxiety (e.g., Rood, Roelofs, Bogels, & Alloy, 2010; Verstraeten, Bijttebier, Vasey, & Raes, 2011), as well as to prospectively predict symptoms of anxiety during adolescence (McLaughlin & Nolen-Hoeksema, 2011; Roelofs et al., 2009; for an exception, see Hankin, 2008). This is perhaps not surprising given the substantial comorbidity between anxiety and depression and conceptual overlap

between measures of negative self-focused attention such as rumination and worry (e.g., Verstraeten et al., 2011).

However, few prospective studies have evaluated the specificity of response style-stress interactions to symptoms of depression. Because rumination is conceptualized as a response style to dysphoric mood (as opposed to negative mood in general), rumination might be expected to exacerbate the effects of stress on dysphoric mood, but not the effects of stress on other internalizing symptoms such as anxiety. In contrast with this hypothesis, the one prospective study of the symptom specificity of rumination-stress interactions indicated that the rumination-total stress interaction predicted increasing trajectories of anxiety symptoms in addition to depressive symptoms (Hankin, 2009), but this study did not report stress subtypes. Additionally, to our knowledge, no prospective study has evaluated the specificity of distractive or problem-solving response styles to symptoms of depression. Thus, it remains unclear which types of stress put adolescents who ruminate (or fail to distract or problem-solve) at greatest risk for experiencing depressive versus other symptoms such as anxiety.

Can Response Styles and Stress Account for the Emerging Sex Difference in Depression?

Previous studies have found that adolescent girls experience greater exposure to stressors, particularly interpersonal stressors, than boys (Hankin & Abramson, 2001) and that this differential stress exposure may account for the sex difference in depressive symptoms (Hankin, Mermelstein, & Roesch, 2007). Other studies also have reported that rumination accounts for sex differences in depression among adolescents (e.g., Hilt, McLaughlin, & Nolen-Hoeksema, 2010). Although stress and rumination may each help to explain girls' increasing depression trajectories during adolescence, it is possible that integrating these two risk factors would allow for a better understanding of which adolescents are most likely to become depressed.

In the present study, we evaluate two ways in which response styles may moderate the impact of stress on depressive symptoms, and how these relationships may explain the emergence of sex differences in depression in adolescence. First, a moderation model would suggest that the tendency for rumination (or low distraction or problem-solving) to confer vulnerability to depression following stress is stronger among girls than among boys (i.e., differential reactivity). Some theorists have hypothesized that cognitive vulnerabilities such as rumination may not moderate the relationship between stressors and depression until abstract reasoning and formal operational thought emerges around early adolescence (e.g., Turner & Cole, 1994). Because adolescent girls often experience puberty and this associated cognitive development earlier than boys, when ruminating, early adolescent girls may be able to more thoroughly consider the negative causes and consequences of stressful events in their lives, which may precipitate or exacerbate dysphoric mood. Consistent with this hypothesis, one study found that the rumination-stress interaction predicted depressive symptoms among 7-to-14 year old girls, but not among boys, but other studies either have found no sex differences in the rumination-stress interaction (Abela & Hankin, 2011; Rood et al., 2012; Weir & Jose, 2008) or have not reported sex differences in this interaction (Cox

et al., 2011; Hankin, 2009). Moreover, no study has evaluated sex differences in the rumination interaction with various stress subtypes.

Second, a moderated mediation model (Preacher, Rucker, & Hayes, 2007) would suggest that adolescent girls experience greater levels of interpersonal stressors than boys, which drives the sex difference in depression (Hankin et al., 2007), and this indirect pathway between sex and depression via stress may be particularly strong among (i.e., moderated by) adolescents who ruminate (or fail to distract or problem-solve). The only study to evaluate this question used a sample of early-to-middle adolescents and found that the rumination-stress interaction mediated girls' initial depression levels, but did not explain girls' increasing trajectories of depressive symptoms over time (Hankin, 2009). However, it is unclear whether rumination would differentially moderate the effects of subtypes of stress to better explain girls' increasing depressive symptom trajectories or the initial emergence of sex differences in depression.

The Present Study

To build on these limitations of the extant literature, we prospectively evaluated response styles as vulnerabilities to depression in a community sample during the phase of adolescence when sex differences in depression first emerge. First, we explored whether the effects of response styles on symptoms of depression and anxiety depended on the type of stress experienced, using subtypes of negative life events, and more specific stressors, such as PV, EA, and EN. We hypothesized that whereas stress would predict higher levels of symptoms of both depression and anxiety, response styles would only moderate the impact of stressors on symptoms of depression. Second, we evaluated sex differences in response style-stress interactions. We hypothesized that relative to boys, girls who ruminate (or fail to use distraction or problem-solving) in response to dysphoric mood would be particularly likely to experience higher levels of depressive symptoms following interpersonal stressors. Third, we evaluated whether interpersonal stressors would mediate the relationship between sex and depressive symptoms, and whether response styles would moderate this indirect pathway.

Method

Participants

Sample recruitment—The current sample was part of a study designed to evaluate racial and sex differences in the development of depression among Caucasian and African-American adolescents (Alloy et al., 2012). Caucasian and African-American adolescents, ages 12–13, and their mothers or primary female caregivers, were recruited from Philadelphia area public and private middle schools. Participants were recruited via two methods. First, with the permission of the Philadelphia School District (PSD), we mailed a letter of introduction and description of the study to parents of students attending schools in the PSD. Caregivers could call or return a prepaid postcard indicating their interest in the study, although most families were recruited through follow-up phone calls from project staff inviting female caregivers and their adolescent children to participate (approximately 68% of the study sample, representing approximately 5% of the students from these

schools). Second, advertisements that described the study were placed in Philadelphia area newspapers and caregivers called in to indicate their interest (32% of the sample). Participant demographic characteristics were representative of the Philadelphia area.

Mothers (93.7% of caregivers were the adolescents' mothers) interested in participating with their adolescent children completed a screening over the phone to determine eligibility. Adolescents were eligible for the study if they were 12 or 13 years old; identified as Caucasian/White, African-American/Black or Biracial (adolescents could be Hispanic or non-Hispanic as long as they also identified as White or Black); and the primary female caregiver was also willing to participate. Adolescents were ineligible for the study if there was no mother/primary female caregiver available to participate; either the adolescent or caregiver did not read or speak English well enough to be able to complete the study assessments; or either the adolescent or caregiver was mentally retarded, had a severe developmental disorder (e.g., autism), had a severe learning disability or other cognitive impairment, was psychotic, or exhibited any other medical or psychiatric problem that would prevent either of them from completing the study assessments.

Study sample—The sample for this study includes 256 adolescents (Mean = 12.32 years old; $SD = 0.61$) and their caregivers who completed at least the baseline assessments and one follow-up assessment. The study sample was 54% female, 51% African American, and 2.3% Hispanic. The families represented a range of socioeconomic status levels, with 24.1% of participants falling below \$30,000 annual family income, 35.4% falling between \$30,000 – \$59,999, 17.2% falling between \$60,000 – \$89,999, and 23.3% falling above \$90,000. Thirty-six families declined participation after the baseline visit, resulting in the current sample of 256 adolescents (an 88% retention rate). Adolescents who completed the follow-up visit had fewer depressive symptoms at baseline ($t = 2.32, p = .02$) and were less likely to be Caucasian ($\chi^2 = 5.37, p = .02$), but did not differ on any other characteristics.

Procedures

Adolescents completed a baseline session lasting 2–3 hours at which measures of depressive symptoms, anxiety symptoms, and response styles were completed. At a follow-up visit approximately 9 months later (Mean = 264 days; $SD = 95$ days), adolescents completed measures of depressive symptoms, anxiety symptoms, and measures of relational peer victimization, emotional abuse and emotional neglect that had occurred since the baseline visit. Adolescents and their mothers also completed a measure of life events that had occurred to the adolescent since the baseline visit, and adolescents completed an interview to verify the occurrence of these events (see below).

Measures

Depressive Symptoms—The Children's Depression Inventory (CDI; Kovacs, 1985) is a widely used self-report measure assessing depressive symptoms in youth. It is designed for use with youth of ages 7 to 17 and consists of 27 items that reflect affective, behavioral, and cognitive symptoms of depression. Items are rated on a 0 to 2 scale and are summed for a total depression score, with higher scores indicating more depressive symptoms. The CDI has good validity and reliability as a measure of depressive symptoms (Klein, Dougherty, &

Olino, 2005). Internal consistency in this sample was $\alpha = .86$ at baseline and $\alpha = .80$ at follow-up.

Anxiety Symptoms—The Multidimensional Anxiety Scale for Children (MASC; March, Parker, Sullivan, Stallings, & Conners, 1997) is a 39-item self-report questionnaire assessing anxiety symptoms in youth. It includes questions about physical anxiety, social anxiety, harm avoidance, and separation anxiety. Adolescents responded to each item on a 4-point Likert scale with response options of never, rarely, sometimes, or often. The MASC total score (MASC-T) was used, with higher scores indicating more anxiety. The MASC has excellent retest reliability and good convergent and discriminant validity (March et al., 1997). Internal consistency in this sample was $\alpha = .86$ at baseline and at follow-up.

Response Styles—Response styles were evaluated at the baseline visit with the Children's Response Styles Questionnaire (CRSQ; Abela, Vanderbilt, & Rochon, 2004), a 21-item self-report questionnaire that assesses youths' styles to respond to sad/depressive moods with rumination, distraction, or problem-solving. Abela et al. (2007) demonstrated that the CRSQ has a two-factor structure, with one rumination factor and one factor for distraction and problem-solving.¹ For each item, adolescents rate the frequency of their thoughts or feelings when they are sad on 4-point scales of never, sometimes, often, or almost always. Subscale items are summed, and higher scores indicate a greater tendency to engage in rumination or distraction/problem-solving when feeling sad. Past research with the CRSQ indicated good validity and moderate internal consistency (Abela et al., 2004, 2007). Internal consistencies for this sample were $\alpha = .85$ for rumination and $\alpha = .71$ for distraction/problem-solving.

Emotional Abuse (EA) and Emotional Neglect (EN)—The EA and EN subscales of the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003) were administered to measure adolescents' self-reports of familial EA and EN. The instructions were modified to ask about experiences that occurred between the baseline and follow-up assessments (as opposed to asking about experiences growing up as in the original measure). Each subscale consists of five items and each item is rated on a 5-point Likert scale ranging from 1 ("Never true") to 5 ("Very often true"). The total score of each subscale is obtained by summing all five items after reverse-scoring some items, with higher scores indicating more EA or EN. Other subscales of the CTQ were not collected for the present study. Several studies have demonstrated that the CTQ-EA and CTQ-EN have excellent reliability and validity (Bernstein et al., 2003). Internal consistency in our sample was $\alpha = .73$ for emotional abuse and $\alpha = .76$ for emotional neglect.

Relational Peer Victimization—The Social Experience Questionnaire (SEQ; Crick & Grotpeter, 1996) measures youths' reports of being the target of aggressive acts committed by their peers. The original SEQ consists of three subscales of peer acts: peer relational victimization, peer overt victimization, and receipt of prosocial acts from peers. The current study collected only the relational victimization subscale (e.g., "others left you out").

¹A principal component factor analysis of our data indicated a factor structure for the CRSQ almost identical to the one reported by Abela et al. (2007); hence, we used the two factors of rumination and distraction/problem-solving.

Responses to the items on the scale range from 0 (“*Never*”) to 5 (“*Daily or almost daily*”). The SEQ has demonstrated good psychometric properties in previous studies (Crick & Grotpeter, 1996). Internal consistency of the relational victimization subscale in this sample was $\alpha = .69$.

Negative Life Events—Life events were evaluated with the Adolescent Life Events Questionnaire (ALEQ; Hankin & Abramson, 2002), designed to assess the occurrence of a broad range of negative or stressful events often reported by adolescents, including familial, peer, and school/achievement events. Adolescents and their mothers completed separate versions of the 63-item ALEQ and indicated events that occurred in the adolescent’s life since the baseline assessment. Following completion of the ALEQ, adolescents completed the Life Events Interview (LEI; Safford, Alloy, Abramson, & Crossfield, 2007) with trained interviewers who objectively evaluated whether events endorsed by the adolescents and/or their mothers on the ALEQ met a priori event definition criteria (e.g., for the event “report card with a C- average or less,” interviewers verified with the adolescent that the average grade was in fact a C- or less). Any events that did not meet criteria were disqualified, thus reducing potential problems related to subjective report biases. Interviewers also verified that events occurred within the timeframe since the baseline study visit. We subdivided event types into achievement and interpersonal domains, and we categorized events as dependent or independent (e.g., Hammen, 1991). A priori dependence/independence ratings were coded independently by a team of four doctoral students in clinical psychology ($\kappa = .76$). Discrepancies in ratings were discussed before a consensus rating was made. All events were further categorized as either interpersonal or achievement, resulting in 47 interpersonal events (31 dependent; 15 independent), 10 achievement events (all dependent), and 6 events that were judged to qualify as neither interpersonal nor achievement and which were excluded from the present report. The current study separately examined dependent interpersonal, independent interpersonal, and dependent achievement events. The life event variables reflect sums of the number of events of each type reported by adolescents and/or their mothers that were verified by the LEI with the adolescent. Reliability and validity have been established for the ALEQ (Hankin, 2008; Hankin & Abramson, 2002) and for the LEI (Safford et al., 2007).

Results

Descriptive Analyses

We first tested for sex differences (Table 1) and race differences in study variables. There were no baseline sex differences in symptoms of depression or anxiety. However, compared to boys, girls had significantly higher levels of depressive and anxiety symptoms at follow-up. Girls also experienced higher levels of dependent interpersonal events, consistent with previous studies of stress in adolescence (Hankin & Abramson, 2001). Compared to white adolescents, black adolescents experienced significantly lower levels of anxiety symptoms at follow-up ($t = 1.99, p < .05$), and experienced more independent interpersonal events ($t = 3.44, p < .001$) and dependent achievement events ($t = 2.23, p = .03$). There were no other sex or race differences in study variables. Descriptive statistics and correlations between study variables are displayed in Table 1.

Prospective Analyses: Predicting Depressive Symptoms

We used hierarchical linear regressions to evaluate whether rumination and distraction/problem-solving² interacted with stressors to prospectively predict higher levels of depressive symptoms (Table 2). Response styles and stress variables were centered at their means prior to analysis; to probe the form of significant interactions, we tested for lower-order effects at one standard deviation above and below the mean of rumination or distraction/problem-solving.

Emotional Neglect—Rumination interacted with emotional neglect to prospectively predict higher levels of depressive symptoms (Table 2; Figure 1a), such that emotional neglect predicted depressive symptoms more strongly among individuals with higher levels of rumination ($b = 0.74, t = 6.94, p < .0001$), than among individuals with lower levels of rumination ($b = 0.20, t = 1.98, p < .05$). In contrast, distraction/problem-solving interacted with emotional neglect to predict prospective changes in depressive symptoms (Table 2; Figure 1b), such that emotional neglect predicted higher levels of depressive symptoms among individuals with lower levels of distraction/problem-solving ($b = 0.63, t = 6.30, p < .0001$), but not among individuals with higher levels of distraction/problem-solving ($b = 0.31, t = 1.43, p = .15$). There were no sex differences in these interactions (i.e., three-way interactions).

Emotional Abuse—Rumination interacted only marginally significantly with emotional abuse to predict changes in depressive symptoms at follow-up (Table 2). However, distraction/problem-solving interacted significantly with emotional abuse to prospectively predict higher levels of depressive symptoms (Figure 1c), such that emotional abuse predicted depressive symptoms more strongly among individuals with lower levels of distraction/problem-solving ($b = 0.63, t = 7.01, p < .0001$) than among individuals with higher levels of distraction/problem-solving ($b = 0.31, t = 2.66, p = .01$). There were no sex differences in these interactions.

Peer Victimization—There was a significant three-way interaction between rumination, peer victimization, and sex (Table 2), such that the rumination-peer victimization interaction was significant for girls ($t = 2.04, p < .05$; Figure 1d), but not for boys ($t = -1.55, p = .12$). The form of this interaction for girls was such that peer victimization predicted depressive symptoms more strongly among girls with higher levels of rumination ($b = 0.63, t = 6.16, p < .0001$), than among those with lower levels of rumination ($b = 0.37, t = 2.92, p < .005$). Distraction/problem-solving did not interact with peer victimization to predict changes in depressive symptoms, and this did not differ by sex.

Negative Life Events—Rumination interacted significantly with dependent interpersonal events to predict changes in depressive symptoms at follow-up (Figure 1e). The form of this interaction was such that dependent interpersonal events predicted depressive symptoms

²Abela et al. (2007) suggested conceptualizing the relationship between response styles as a ratio between rumination and distraction/problem-solving. Because we were interested in the individual impact of rumination and distraction/problem-solving on reactivity to stress in the forms of depression and anxiety, we chose to present our data analyzing rumination and distraction/problem-solving separately. However, our results were similar when conceptualizing the response styles using a ratio approach.

more strongly among adolescents with higher levels of rumination ($b = 0.53, t = 6.93, p < .0001$) than among adolescents with lower levels of rumination ($b = 0.24, t = 3.06, p < .005$).

Notably, rumination did not interact with dependent achievement events or with independent interpersonal events to predict depressive symptoms at follow-up (Table 3). Distraction/problem-solving did not interact with any type of negative events to predict changes in depressive symptoms (Table 3). There were no sex differences in these interaction analyses.

Prospective Analyses: Predicting Anxiety Symptoms

Neither rumination nor distraction/problem-solving interacted with emotional abuse, emotional neglect, peer victimization, or life events to predict anxiety symptoms³ at follow-up, controlling for initial anxiety symptoms (Tables 2 and 3). Generally consistent with our hypotheses, these analyses indicated that there were main effects of emotional abuse, peer victimization, and dependent interpersonal events predicting anxiety symptoms at follow-up, but that these effects were not moderated by rumination or distraction/problem-solving. There were no sex differences in these interactions. This provides evidence that rumination (and low distraction/problem-solving) did not confer vulnerability to anxiety symptoms when adolescents experienced high levels of these stressors.

Does Rumination Moderate the Pathway between Dependent Interpersonal Events and the Emerging Sex Difference in Depressive Symptoms?

Finally, we evaluated whether rumination moderated the indirect pathway between sex and depressive symptoms via dependent interpersonal life events. To evaluate this question, we employed moderated mediation analyses with bootstrapping using the MODMED script designed by Preacher et al. (2007). This approach permitted us to test the hypothesis that sex predicted depressive symptoms indirectly via the experience of dependent interpersonal events, and that the pathway between dependent interpersonal events and depressive symptoms would be strongest among adolescents with higher levels of rumination (i.e., rumination would moderate the relation between dependent interpersonal events and depressive symptoms within this pathway; see Figure 2; see also Preacher et al., 2007, p. 194, Model 3).

Results of the moderated mediation analysis are displayed in Table 4. Sex predicted depressive symptoms at follow-up, controlling for baseline depressive symptoms. After controlling for initial depressive symptoms, sex significantly predicted dependent interpersonal events, and dependent interpersonal events significantly predicted depressive symptoms at follow-up. When dependent interpersonal events were included in the model, sex no longer significantly predicted depressive symptoms at follow-up. Finally, the interaction between rumination and dependent interpersonal events predicting depressive symptoms at follow-up was significant, indicating that the conditional indirect pathway between sex and depressive symptoms via dependent interpersonal events was stronger among individuals with higher levels of rumination, thus meeting criteria for moderated

³To rule out the possibility that response styles would interact with stressors to predict physical symptoms of anxiety (e.g., Hankin, 2009), we replicated these analyses using the physical anxiety symptom subscale of the MASC. No response style-stress interactions significantly predicted physical anxiety symptoms.

mediation (Figure 2, Table 4). This suggests that adolescent girls may be at greater risk for depression than boys because they experience higher levels of dependent interpersonal events, and this stress may be particularly likely to lead to depression among adolescents who tend to ruminate in response to dysphoric mood.

Discussion

The current study prospectively evaluated response styles in the context of stress and their specificity to symptoms of depression and anxiety in a community sample of early adolescents. Consistent with our hypotheses, response styles interacted with several types of stressors, including dependent interpersonal events, relational peer victimization, emotional abuse, and emotional neglect, to predict symptoms of depression, but not anxiety. These results suggest that individuals who ruminate or do not engage in distraction or problem-solving in response to dysphoric mood may be more reactive to sad mood following stress, specifically in the form of depressive symptoms. We also found support for rumination as a moderator of the impact of stress on the emergence of sex differences in depression during adolescence. Consistent with a moderation model, girls with higher levels of rumination were more reactive to the effects of peer relational victimization than boys, suggesting that girls who ruminate may be particularly vulnerable to depressive symptoms following the occurrence of relational victimization. Consistent with a mediational model, dependent interpersonal stress mediated the sex difference in depressive symptoms that emerged at follow-up, and this pathway was stronger among adolescents who ruminate. Thus, the sex difference in depression that emerged during early adolescence may be in part explained by girls' greater generation of dependent interpersonal stress, which predicts higher levels of depressive symptoms, particularly among adolescents who ruminate.

The current study extends past research on response styles as vulnerabilities to depression in adolescence in several important ways. For one, in contrast with a recent study that did not find evidence of symptom specificity (Hankin, 2009), this is the first study to find that the occurrence of stress among adolescents who ruminate predicts symptoms of depression, but not anxiety. Although the occurrence of several types of stressors conferred risk for both depressive and anxiety symptoms, rumination and distraction/problem-solving did not moderate these associations to confer additional risk for anxiety symptoms. Although there is some evidence that ruminative individuals in general may be at risk for symptoms of anxiety during early adolescence (Roelofs et al., 2009), our results suggest that adolescents who ruminate or engage in less distraction or problem-solving may be specifically vulnerable to developing symptoms of depression, but not anxiety, following the occurrence of certain stressors. Our results also contrast with Hankin's (2009) study which found that rumination conferred vulnerability to symptoms of anxiety related to physiological arousal following stressors; in our study rumination did not moderate the impact of any types of stressors on physical, or total, symptoms of anxiety. One possible explanation for the disparate findings between the current and past studies could be the younger age of the adolescents in our sample, which could have resulted in less variability in anxiety symptoms and reduced our power to detect response style-stress interactions.

Second, this is the first study to separately examine rumination and distraction/problem-solving, two components of the RST, in the context of stress. Previous studies of response styles in the context of stress have focused exclusively on rumination as a vulnerability factor to depressive symptoms (e.g., Abela et al., 2012; Abela & Hankin, 2011; Cox et al., 2011; Hankin, 2009); however, our study provides evidence that the tendency to not engage in distraction or problem-solving may also confer risk to depression following the occurrence of stress. More specifically, whereas rumination significantly interacted with several types of stress to predict depressive symptoms, individuals with low levels of distraction or problem-solving were particularly likely to develop symptoms of depression following experiences of emotional abuse and neglect. This suggests that adolescents who do not engage in distraction or problem-solving in response to depressed mood may be particularly vulnerable to the effects of emotional maltreatment in the form of depression. It also suggests that distracting oneself from sad mood (e.g., the ability to disengage from negative stimuli) or problem-solving about how to improve the situation that resulted in the negative mood may serve as a protective factor against depression following the occurrence of emotional maltreatment.

Third, although two recent studies utilized a domain-specific approach to examine rumination in the context of stress (Cox et al., 2011; Kercher & Rapee, 2009), this is the first study to simultaneously examine events by dependence and independence, as well as specific domains of events (interpersonal and achievement), including relational peer victimization, emotional abuse, and emotional neglect. Consistent with the study by Kercher and Rapee (2009), our results indicate that rumination may confer vulnerability to depression when adolescents experience dependent stressors, and not when they experience independent stressors. It is possible that adolescents who ruminate are particularly likely to do so when they attribute the causes of their dysphoric mood to events that are due to something about them, such as a behavior or personality trait. In this sense, following dependent events, adolescents may attribute their dysphoric mood to their own actions or characteristics, triggering more rumination and increasing their risk of developing depressive symptoms.

Another possible reason for this finding could be the types of events that are characteristic of dependent stressors. In the current study, rumination interacted with dependent interpersonal stressors, and not dependent achievement stressors, to predict depressive symptoms. In particular, adolescence is a time of increasing importance of peer relationships, resulting in conflict within the family as well as reliance on peers for social interaction and support (Furman & Buhrmester, 1992). Thus, ruminative adolescents may be particularly reactive to the depressive effects of dependent familial stressors (e.g., conflict) and difficulties with peers that threaten social relationships. Our findings may help to account for discrepancies among previous studies that only have examined negative life events as a unitary construct, and that have not found support for vulnerability-stress models of rumination in adolescence (Abela et al., 2009; Jose & Brown, 2008; Rood et al., 2012; Weir & Jose, 2008). This finding is in contrast to a recent study by Cox et al. (2011), which found that rumination interacted with dependent and independent stressors, but not interpersonal stressors, to predict depressive symptoms. However, Cox et al. did not separately examine independent and dependent interpersonal stressors, although their study had methodological strengths in

that it used a daily diary approach to measurement and hierarchical linear modeling for analyses.

In contrast to a recent meta-analysis documenting that adolescent girls report a more ruminative response style than boys (Rood et al., 2009), there were no sex differences in response styles in the current sample. This finding is consistent with several other studies that have found no sex differences in rumination or distraction in early adolescence (see Abela & Hankin, 2008) as well as with research suggesting that differences in response styles may not emerge until early-to-middle adolescence (e.g., Jose & Brown, 2008).

The current study evaluated two possible mechanisms to explain the emergence of sex differences in depressive symptoms in early adolescence: moderation (i.e., that the interaction between response styles and stress may be stronger for girls) and mediation (i.e., that the interpersonal stress may account for the sex difference in depression at follow-up and that this pathway is stronger among adolescents who ruminate). Although support for the moderation model in the literature has been mixed, the current study is the first to examine subtypes of negative life events within this context. Our results indicate that girls who ruminate were more likely to experience depressive symptoms than were boys following relational peer victimization. Rumination may make girls more vulnerable to depression following experiences of relational victimization, which is a stressor that may be particularly salient for adolescent girls due to girls' greater emphasis on peer relationships and greater interpersonal orientation than boys (Gore, Aseltine, & Colten, 1993).

In terms of the mediation model, we found that dependent interpersonal stress mediated the emergence of the sex difference in depressive symptoms at follow-up, and that this indirect pathway was stronger among adolescents who ruminated. Thus, girls' greater exposure to dependent interpersonal stressors, along with their greater reactivity to dysphoria following experiences of peer victimization if they ruminate, may make girls particularly vulnerable to the development of depressive symptoms during early adolescence. It is also important to note that previous research (e.g., McLaughlin & Nolen-Hoeksema, 2012) has indicated that rumination may play a role in creating many of the types of stressors that interacted with rumination to predict depressive symptoms in the current study. Thus, as the sex difference in rumination emerges during early-to-mid adolescence (Abela & Hankin, 2008; Jose & Brown, 2008) along with girls' elevated levels of interpersonal stress, these factors may work reciprocally and synergistically to make girls particularly susceptible to developing depression.

There were a number of strengths of the current study, including the use of a prospective design that allowed us to follow a demographically diverse community sample of early adolescents through a meaningful developmental period when sex differences in depression first emerged. Additionally, our life event data were objectively evaluated via an interview, which likely reduced the potential for confounding reports of life events with other self-report measures such as rumination that are also associated with depression.

Several limitations of the current study should be noted. Although the current study utilized a prospective design, it was limited by having only two waves of data. This precluded our

ability to use within-subject measurement of variations in stress (Abela & Hankin, 2008), and could have resulted in reported stress being biased by symptoms at follow-up. We assessed trait rumination in response to dysphoric mood, but we did not evaluate the actual occurrence of rumination in response to the life events that occurred across the follow-up period. The study also used self-report measures to assess response styles, depressive symptoms, peer victimization, emotional abuse, and emotional neglect. Future studies may benefit from using more objective means to assess these constructs, such as interview or behavioral measures. It is also possible that the CDI assessed symptoms of general distress rather than depression more specifically. Although we evaluated emotional maltreatment, we did not measure other abusive experiences (e.g., physical and sexual abuse) that would likely be salient to adolescents. Many of the events we evaluated were chronic and interpersonal in nature; thus, we cannot rule out the possibility that more acute and traumatic events would predict anxiety symptoms among adolescents who ruminate.

Although correlations between response styles and stressors were generally small, Kraemer et al. (2008) suggest that statistical interactions between correlated measures in predicting an outcome should be interpreted as evidence of mediation rather than moderation. Thus, future studies should also evaluate mediational models in which response styles may generate stress that leads to internalizing symptoms (e.g., McLaughlin & Nolen-Hoeksema, 2012). Additionally, although participant retention was high, Caucasian adolescents with more depressive symptoms were less likely to complete the follow-up visit, which may limit the results' generalizability. Finally, the effect sizes of the interactions were relatively small, so the clinical significance of these effects is unclear, although the results of previous studies provide evidence that the relationships we evaluated here at the symptom level are meaningful (Abela & Hankin, 2011).

Implications for Research, Policy, and Practice

These findings have the potential for significant implications for research and clinical practice, highlighting the need to evaluate response styles in the context of certain types of life stress and to identify adolescents who may ruminate in response to dysphoric mood following interpersonal stressors. Interventions among youth should target ruminative processes in the prevention and treatment of depression, as well as address distraction and problem-solving as buffers against the impact of stress on depression. Given that adolescent girls may experience more dependent interpersonal stressors than boys, interventions should focus on improving girls' abilities to engage in adaptive responses to these stressors (e.g., distraction or problem-solving), as well as preventing the occurrence of these dependent stressors whenever possible. Interventions to reduce relational victimization (e.g., verbal bullying and social exclusion) may also be particularly helpful for preventing depression among adolescent girls, particularly among those who ruminate in response to sadness. Future research should examine mechanisms by which response styles confer vulnerability to episodes and diagnoses of depression and anxiety among adolescents.

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Figure 1.

Interactions between (a) rumination and emotional neglect; (b) distraction/problem-solving and emotional neglect; (c) distraction/problem-solving and emotional abuse; (d) rumination and peer victimization (significant for girls only); and (e) rumination and dependent interpersonal events, predicting depressive symptoms at follow-up (controlling for initial depressive symptoms).

Figure 2.

Conceptual figure illustrating the significant moderated mediation model of emerging sex differences in depressive symptoms. Dependent interpersonal events mediated the sex differences in depressive symptoms at follow-up, and the pathway between dependent interpersonal events and follow-up depressive symptoms was moderated by rumination. This indicates that the sex difference in depressive symptoms at follow-up was explained by girls' higher level of dependent interpersonal stress, and that this pathway was particularly strong among adolescents with a greater tendency to ruminate. Initial depressive symptoms (not shown in figure for clarity) were controlled to test prospective prediction of depressive symptoms.

Table 1

Descriptive Statistics and Correlations between Primary Study Variables

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1 CDI Baseline	—	.68	.28	.16	.52	-.41	.36	.29	.13	.34	.36	.34
2 CDI Follow-Up	.41	—	.31	.42	.38	-.36	.39	.45	.25	.44	.46	.52
3 MASC Baseline	.19	.12	—	.59	.41	-.08	-.00	.14	-.06	.14	.10	.31
4 MASC Follow-Up	-.02	.21	.57	—	.12	-.10	.05	.23	.06	.26	.04	.40
5 CRSQ-Rumination	.24	.22	.44	.28	—	-.22	.14	.19	.05	.28	.12	.19
6 CRSQ-Distraction/Problem-Solving	-.04	-.13	.19	.05	.16	—	-.19	-.21	-.11	-.12	-.19	-.05
7 ALEQ Achievement Events	.06	.29	-.17	-.02	-.05	-.04	—	.55	.56	.28	.27	.24
8 ALEQ Dependent Interpersonal Events	.12	.42	.12	.32	.12	-.11	.49	—	.43	.53	.35	.41
9 ALEQ Independent Interpersonal Events	.05	.17	-.06	-.05	-.06	.02	.22	.27	—	.26	.03	.22
10 CTQ-Emotional Abuse	.20	.55	.01	.18	.12	-.24	.30	.41	.16	—	.42	.39
11 CTQ-Emotional Neglect	.14	.40	-.17	-.04	.04	-.33	.23	.26	-.02	.44	—	.34
12 SEQ-Peer Relational Victimization	.14	.35	.08	.23	.07	.03	.23	.29	.11	.17	.21	—
Mean (girls)	6.78	5.62	40.58	37.12	24.49	19.38	3.34	7.01	2.45	7.55	8.12	2.32
SD (girls)	6.62	5.48	13.55	13.97	7.64	4.54	2.01	4.25	2.12	3.08	2.99	3.37
Mean (boys)	5.93	4.18	39.43	33.37	23.47	19.14	3.30	5.74	2.33	7.16	7.97	1.73
SD (boys)	4.98	3.79	13.28	11.81	6.13	4.17	1.94	3.66	1.69	2.83	3.16	2.78
Sex difference (t)	1.17	-2.45*	-0.68	-2.28*	-1.19	-0.43	-0.17	-2.54*	-0.52	-1.04	-0.39	-1.53

Note. Correlations above the diagonal are for girls; correlations below the diagonal are for boys. For sex differences,

* $p < .05$. Correlations .19 are significant at $p < .05$. CDI = Children's Depression Inventory; MASC = Multidimensional Anxiety Scale for Children; CRSQ = Children's Response Style Questionnaire; ALEQ = Adolescent Life Event Questionnaire; CTQ = Childhood Trauma Questionnaire; SEQ = Social Experience Questionnaire.

Table 2

Interactions between Response Styles and Emotional Abuse, Emotional Neglect, and Peer Victimization, Predicting Symptoms of Depression and Anxiety

Depressive Symptoms					Anxiety Symptoms						
Step	Variable	β	T	R ²	f	Step	Variable	β	t	R ²	f
CTQ Emotional Abuse											
<u>Rumination</u>											
1	T1 CDI	.48	9.15***	.36***	.56	1	T1 MASC	.62	11.14***	.34***	.52
2	Rumination	.04	0.77	.10***	.19	2	Rumination	-.14	-2.35*	.05***	.08
	EA	.30	5.86***				EA	.20	3.69***		
3	Rumination X EA	.09	1.81 +	.01+	.02	3	Rumination X EA	.04	0.74	<.01	<.01
<u>Distraction/Problem-Solving</u>											
1	T1 CDI	.46	9.26***	.36***	.56	1	T1 MASC	.56	11.02***	.34***	.52
2	Distraction	-.09	-1.95+	.11***	.21	2	Distraction	-.03	-0.64	.04**	.06
	EA	.29	5.75***				EA	.17	3.15**		
3	Distraction X EA	-.11	-2.14*	.01*	.02	3	Distraction X EA	-.03	-0.54	<.01	<.01
CTQ Emotional Neglect											
<u>Rumination</u>											
1	T1 CDI	.46	8.79***	.36***	.56	1	T1 MASC	.61	10.70***	.34***	.52
2	Rumination	.10	1.95*	.09***	.16	2	Rumination	-.08	-1.38	.01	.02
	EN	.30	6.32***				EN	.03	0.58		
3	Rumination X EN	.17	3.71***	.03***	.06	3	Rumination X EN	-.01	-0.18	<.01	<.01
<u>Distraction/Problem-Solving</u>											
1	T1 CDI	.50	9.87***	.36***	.56	1	T1 MASC	.58	11.13***	.34***	.52
2	Distraction	-.07	-1.30	.08***	.14	2	Distraction	-.06	-1.1	<.01	<.01
	EN	.24	4.70***				EN	-.01	-0.21		
3	Distraction X EN	-.11	-2.15*	.01*	.02	3	Distraction X EN	-.06	-1.11	<.01	<.01
SEQ Peer Victimization											

Depressive Symptoms						Anxiety Symptoms					
Step	Variable	β	T	R ²	f	Step	Variable	β	t	R ²	f
<u>Rumination</u>						<u>Rumination</u>					
1	T1 CDI	.46	8.36***	.38***	.61	1	T1 MASC	.57	10.07***	.34***	.52
2	Rumination	.06	0.98	.11***	.22	2	Rumination	-.11	-1.86+	.06***	.10
	PV	.32	5.21***				PV	.23	4.40***		
	Sex	-.06	-1.36			3	Rumination X PV	.03	0.50	<.01	<.01
3	Rumination X PV	.11	2.06*	.01	.02						
	Rumination X Sex	-.03	-0.46								
	Sex X PV	-.06	-0.95								
4	Rumination X PV X Sex	-.11	-2.11*	.01*	.02						
<u>Distraction/Problem-Solving</u>						<u>Distraction/Problem-Solving</u>					
1	T1 CDI	.48	9.39***	.38***	.61	1	T1 MASC	.54	10.41***	.34***	.52
2	Distraction	-.15	-3.09***	.12***	.24	2	Distraction	-.07	-1.28	.05***	.08
	PV	.33	6.84***				PV	.24	4.62***		
3	Distraction X PV	-.03	-0.71	<.01	<.01	3	Distraction X PV	.07	1.39	.01	.02

[†] $p < .10$,

* $p < .05$,

** $p < .01$,

*** $p < .001$.

Note. CDI = Children's Depression Inventory; MASC = Multidimensional Anxiety Scale for Children; EA = Emotional Abuse subscale of the Childhood Trauma Questionnaire; EN = Emotional Neglect subscale of the Childhood Trauma Questionnaire; PV = Peer Relational Victimization subscale of the Social Experience Questionnaire. Three-way interactions with sex are only displayed when significant. All significant results maintained significance when controlling for sex and race. Sex is coded as 0 = girls, 1 = boys.

Table 3

Interactions between Rumination and Dependent Achievement Events, Dependent Interpersonal Events, and Independent Interpersonal Events, Predicting Symptoms of Depression and Anxiety

Depressive Symptoms						Anxiety Symptoms					
Step	Variable	β	t	R^2	f^2	Step	Variable	β	t	R^2	f^2
<u>ALEQ Dependent Achievement Events</u>											
Rumination											
1	T1 CDI	.50	9.13***	.36	.56	1	T1 MASC	.62	10.89***	.34***	.51
2	Rumination	.10	1.88 [†]	.06	.10	2	Rumination	-.08	-1.34	.01	.02
	ALEQ-Ach	.22	4.50***				ALEQ-Ach	.08	1.57		
3	Rumination X ALEQ-Ach	.05	1.08	<.01	<.01	3	Rumination X ALEQ-Ach	-.07	-1.24	<.01	<.01
<u>Distraction/Problem-Solving</u>											
1	T1 CDI	.52	9.95***	.36***	.56	1	T1 MASC	.58	11.28***	.33***	.49
2	Distraction	-.10	-2.07*	.06***	.10	2	Distraction	.06	1.18	.01	.02
	ALEQ-Ach	.22	4.36***				ALEQ-Ach	.06	1.12		
3	Distraction X ALEQ-Ach	-.05	-0.92	<.01	<.01	3	Distraction X ALEQ-Ach	.04	0.75	<.01	<.01
<u>ALEQ Dependent Interpersonal Events</u>											
Rumination											
1	T1 CDI	.48	9.32***	.36***	.56	1	T1 MASC	.59	10.67***	.34***	.51
2	Rumination	.05	1.03	.11***	.21	2	Rumination	-.11	-1.83 [†]	.05***	.08
	ALEQ-Dep Interp	.32	6.86***				ALEQ-Dep Interp	.21	4.19***		
3	Rumination X ALEQ-Dep Interp	.13	2.82**	.02**	.04	3	Rumination X ALEQ-Dep Interp	-.03	-0.50	<.01	<.01
<u>Distraction/Problem-Solving</u>											
1	T1 CDI	.49	9.90***	.36***	.56	1	T1 MASC	.55	10.74***	.33***	.49
2	Distraction	-.08	-1.71	.11***	.21	2	Rumination	-.03	-0.67	.04***	.06
	ALEQ-Dep Interp	.31	6.50***				ALEQ-Dep Interp	.19	3.72***		
3	Distraction X ALEQ-Dep Interp	-.05	-1.01	<.01	<.01	3	Rumination X ALEQ-Dep Interp	.01	0.18	<.01	<.01
<u>ALEQ Independent Interpersonal Events</u>											
Rumination											

Depressive Symptoms						Anxiety Symptoms					
Step	Variable	β	t	R^2	f^2	Step	Variable	β	t	R^2	f^2
1	T1 CDI	.53	9.70***	.36***	.56	1	T1 MASC	.62	10.75***	.34***	.51
2	Rumination	.11	2.01*	.05**	.05	2	Rumination	-.08	-1.41	.01	.02
	ALEQ-Indep Interp	.16	3.13**				ALEQ-Indep Interp	.06	1.19		
3	Rumination X ALEQ-Indep Interp	.04	0.88	<.01	<.01	3	Rumination X ALEQ-Indep Interp	<.01	0.08	<.01	<.01
	Distraction/Problem-Solving						Distraction/Problem-Solving				
1	T1 CDI	.54	10.44***	.36***	.56	1	T1 MASC	.58	11.29***	.33***	.49
2	Distraction	-.12	-2.29	.04***	.07	2	Distraction	.06	-1.18	.01	.02
	ALEQ-Indep Interp	.15	2.92**				ALEQ-Indep Interp	.05	0.99		
3	Distraction X ALEQ-Indep Interp	-.05	-1.03	<.01	<.01	3	Distraction X ALEQ-Indep Interp	-.01	-0.11	<.01	<.01

[†]
 $p < .10$,

*
 $p < .05$,

**
 $p < .01$,

 $p < .001$.

Note. CDI = Children's Depression Inventory; MASC = Multidimensional Anxiety Scale for Children; ALEQ = Adolescent Life Event Questionnaire. All significant results maintained significance when controlling for sex and race.

Moderated Mediation Analyses with the Interaction of Rumination and Dependent Interpersonal Events Accounting for Emerging Sex Differences in Depressive Symptoms.

Table 4

Sex as a Predictor of Dependent Interpersonal Events (a path)					
Predictor	B	t			
T1 CDI	0.16	3.71***			
Sex	-1.15	-2.32*			
Sex as a Predictor of Follow-Up Depressive Symptoms (c path)					
Predictor	B	t			
T1 CDI	0.48	11.88***			
Sex	-1.03	-2.14*			
Interaction between Rumination and Dependent Interpersonal Events, Predicting Follow-Up Depressive Symptoms (b path)					
Predictor	B	T			
T1 CDI	0.39	9.29***			
Sex	-0.46	-1.04			
Rumination	0.04	1.00			
ALEQ-Dep Interp	0.38	6.65***			
Rumination X ALEQ-Dep Interp	0.02	2.78**			
Conditional Indirect Effect of Sex on Follow-Up Depressive Symptoms via Dependent Interpersonal Events, at High and Low Levels of Rumination (c' path)					
	Indirect Effect	SE	Z	CI (lower)	CI (upper)
High Rumination	-0.60	0.27	-2.17*	-1.19	-0.09
Low Rumination	-0.26	0.15	-1.76*	-0.62	-0.02

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

Note: N = 5000 bootstrap samples. CDI = Children's Depression Inventory; ALEQ = Adolescent Life Event Questionnaire. Sex is coded as 0 = girls, 1 = boys.