Transactional Associations Between Youths' Responses to Peer Stress and Depression: The Moderating Roles of Sex and Stress Exposure

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Abstract

This study examined transactional associations between responses to peer stress and depression in youth. Specifically, it tested the hypotheses that (a) depression would predict fewer effortful responses and more involuntary, dysregulated responses to peer stress over time; and (b) fewer adaptive and more maladaptive responses would predict subsequent depression. Youth (*M* age = 12.41; *SD* = 1.19; 86 girls, 81 boys) and their maternal caregivers completed semi-structured interviews and questionnaires at three annual waves. Multi-group comparison path analyses were conducted to examine sex and stress-level differences in the proposed reciprocal-influence model. In girls and in youth exposed to high levels of peer stress, maladaptive stress responses predicted more depressive symptoms and adaptive stress responses predicted fewer depressive symptoms at each wave. These findings suggest the utility of preventive interventions for depression designed to enhance the quality of girls' stress responses. In boys, depression predicted less adaptive and more maladaptive stress responses, but only at the second wave. These findings suggest that interventions designed to reduce boys' depressive symptoms may help them develop more adaptive stress responses.

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Youth depression is often a debilitating condition that compromises many aspects of development. Unfortunately, the pernicious consequences of depression may exacerbate symptoms, thereby fueling a self-perpetuating cycle of impairment (Rudolph, Hammen, & Daley, 2006). Understanding how this cycle unfolds can inform the development of interventions that move depressed youth toward more adaptive developmental trajectories. This research examined a transactional, reciprocal-influence process wherein depression contributes to fewer effortful, effective responses and more involuntary, dysregulated responses to stress, and these maladaptive responses heighten subsequent depression. Guided by interpersonal theories of depression (Hammen, 2006; Joiner, Coyne, & Blalock, 1999; Rudolph, 2009), which emphasize the key role of social processes in the perpetuation of depression, this process was examined within the peer context. Because girls and boys differ in many aspects of peer relationships (Rose & Rudolph, 2006), we explored possible sex differences.

Conceptualizing Responses to Peer Stress

Peers play an increasingly important role in youths' lives during early adolescence (Steinberg & Morris, 2001). In light of the importance that peers carry for youth at this time, learning how to successfully negotiate peer difficulties is a critical developmental task. Youth may be exposed to both chronic stressful circumstances (e.g., bullying, social rejection) as well as acute stressors (e.g., fights with friends) within the peer group. Failure to respond effectively to peer stress may heighten youths' risk for depression (Wenz-Gross, Siperstein, Untch, & Widaman, 1997). Whereas adaptive responses may resolve the source of stress and promote healthy relationships that protect against depression, maladaptive responses may fail to resolve stressors and even generate more stress, thereby creating social difficulties and risk for depression.

To conceptualize responses to peer stress, we drew from Compas and colleagues' framework (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001), which proposes two orthogonal dimensions: (a) effortful (controlled, purposeful) versus involuntary (automatic, dysregulated) responses, and (b) engagement (directed toward the source of stress or stress-related emotions or cognitions) versus disengagement (directed away from the source of stress or stress-related emotions or cognitions) responses. Effortful responses, or voluntary, goal-directed efforts to deal with stress, are generally defined as "coping," whereas involuntary responses, or spontaneous emotional or behavioral reactions to stress, are viewed as falling outside this definition (Compas et al., 2001). Effortful engagement includes responses such as problem solving and emotion regulation, whereas effortful disengagement includes responses such as denial and voluntary avoidance. Involuntary engagement includes responses such as intrusive thoughts and physiological arousal, whereas involuntary disengagement includes responses such as involuntary avoidance and inaction (Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000). In this framework, stress responses are specific reactions to stressful events or circumstances, and are distinguished from adjustment outcomes (e.g., depression) that stem from stress exposure.

Linkages between Responses to Stress and Depression

Concurrent research suggests that effortful engagement responses typically are adaptive, whereas effortful disengagement, involuntary engagement, and involuntary disengagement responses typically are maladaptive. Specifically, effortful engagement is associated with fewer depressive symptoms, whereas effortful disengagement, involuntary engagement and involuntary disengagement are associated with more depressive symptoms (e.g., Herman-Stahl, Stemmler, & Petersen, 1995; Thomsen et al., 2002). Within the peer context, fewer effortful engagement responses (i.e., problem solving, positive reappraisal) to hypothetical peer rejection (Reijntjes, Stegge, & Terwogt, 2006) and more effortful disengagement responses (i.e., passive, avoidant coping) to *in vivo* peer rejection (Reijntjes, Stegge, Terwogt, Kamphuis, & Telch, 2006) are linked to more depressive symptoms. Similarly, fewer effortful engagement responses (i.e., advice seeking, conflict resolution) to peer victimization are linked to more internalizing symptoms (Kochenderfer-Ladd, 2004). Thus, in the context of peer stress, adaptive responses include active attempts to engage peer stressors or associated emotions, whereas maladaptive responses include passive or avoidant responses that fail to resolve stressors.

Although these studies support a linkage between responses to stress and depression, they do not shed light on the direction of effect. Consistent with interpersonal models of depression (Cicchetti & Toth, 1998; Joiner et al., 1999; Rudolph, 2009), we proposed that there would be transactional associations between youths' responses to their social environment and their experience of depression. Specifically, we hypothesized that maladaptive responses to peer

stress (less effortful engagement; more disengagement and involuntary responses) would foster more depression whereas adaptive responses to peer stress (more effortful engagement; less disengagement and involuntary responses) would protect youth from depression. In turn, depression would undermine youths' ability to respond adaptively to peer stress. Although the present study did not explicitly examine the pathways that account for this process, it is important to consider how this process may unfold.

Responses to peer stress as an antecedent of youth depression—Maladaptive responses to peer stress may heighten depression through several paths. First, when youth respond with avoidance, inaction, or rumination rather than active efforts to resolve problems or manage emotions, they may experience unresolved problems or even generate more stress, which, in turn, promotes or sustains depression (Hammen, 2006). Second, an inability to effectively manage peer stress may compromise youths' ability to maintain healthy peer relationships that protect them from depression (Rose & Rudolph, 2006; Vernberg, 1990).Third, failing to resolve peer stress and associated emotions may lead youth to appraise themselves negatively, triggering low self-worth, hopelessness, and negative emotions that lead to depression (Garber, Weiss, & Shanley, 1993).

Although little prospective research has examined the association between maladaptive responses to peer stress and subsequent depression, a few longitudinal studies support the idea that maladaptive responses to stress serve as an antecedent of depression. For example, effortful engagement (problem solving, support seeking) predicts fewer depressive symptoms in preadolescents (Sandler, Tein, & West, 1994), whereas effortful disengagement (voluntary avoidance) predicts more depressive symptoms in young adults (Blalock & Joiner, 2000). Herman-Stahl et al. (1995) found that youth who shifted toward more effortful engagement (approach coping) and less effortful disengagement (avoidant coping) across one year experienced fewer depressive symptoms, whereas youth who shifted toward less effortful engagement and more effortful disengagement experienced more depressive symptoms.

Responses to peer stress as a consequence of youth depression—Depressive symptoms may, in turn, impair youths' responses to peer stress. Symptoms and associated competence deficits within the peer context, such as maladaptive problem solving (Quiggle, Garber, Panak, & Dodge, 1992; Rudolph, Hammen, & Burge, 1994), conflict negotiation and emotion regulation deficits (Rudolph et al., 1994; Silk, Steinberg, & Morris, 2003), and helpless behavior (Nolen-Hoeksema, Girgus, & Seligman, 1992), may foster fewer effortful, effective responses and more involuntary, maladaptive responses to peer stress. Social withdrawal (Bell-Dolan, Reaven, & Petersen, 1993) may further decrease depressed youths' active engagement with peers to resolve stress. Depressed youth also may have fewer opportunities to seek social support from friends (Klein, Lewinsohn, & Seeley, 1997). Finally, depressive symptoms are associated with more negative views of the self (as unworthy and incompetent; Garber & Martin, 2002; Rudolph & Clark, 2001), peers (as unresponsive and hostile; Rudolph & Clark, 2001; Rudolph, Hammen & Burge, 1997), and one's circumstances (as stressful and beyond one's control; Abramson, Seligman, & Teasdale, 1978; Krackow & Rudolph, 2008; Rudolph, Kurlakowsky, & Conley, 2001). Collectively, these negative beliefs may trigger more disengagement and involuntary responses and fewer engagement responses to peer stress.

Only limited prospective research has investigated the contribution of depression to subsequent responses to stress. In one study (Wadsworth & Berger, 2006), anxiety/ depressive symptoms predicted somewhat more effortful disengagement responses over time in adolescents. In another study, psychological distress (including depressive symptoms)

predicted less effortful engagement and more effortful disengagement responses to stress over time in adults (Terry & Hynes, 1998).

Prospective transactional linkages between responses to stress and depression—Few studies have examined the bi-directional linkages between responses to stress and depression. In one study of female adolescents, Nolen-Hoeksema and colleagues (2007) found that rumination (a form of involuntary engagement that involves an excessive focus on symptoms and their possible causes and consequences) predicted the onset of major depression, and depressive symptoms predicted subsequent increases in rumination. Excessive engagement with symptoms through rumination fosters disengagement from stressors over time (Hong, 2007), potentially due to a focus on symptoms rather than on actively resolving stressors. The present research built on the Nolen-Hoeksema et al. (2007) study by exploring the transactional associations between depression and responses to stress within the peer domain.

Sex Differences in Responses to Stress-Depression Linkages

This study also examined whether sex moderated the proposed reciprocal-influence model. We anticipated that responses that failed to successfully address peer stressors would more strongly predict depression in girls than in boys. Because girls value interpersonal connectedness more than boys (Rose & Rudolph, 2006), girls may be more susceptible to depression when they fail to effectively manage peer stress. Girls who respond to peer problems through avoidance or inaction rather than active problem solving may engage in negative self-evaluations, elicit peer disapproval, and perhaps generate even more stress (e.g., increases in conflict; declines in relationship quality) (Rose & Rudolph, 2006; Rudolph, 2009). Collectively, these negative self- and peer evaluations and heightened stress may contribute to subsequent depression (Garber & Martin, 2002). In contrast, because boys are less invested in interpersonal connectedness, failure to adaptively address peer stressors may have a less damaging effect on their self- and peer evaluations and their relationships, and thus may foster less subsequent depression.

Consistent with these ideas, a few studies reveal sex differences in the concurrent and prospective associations between stress responses and depression. In one study, girls who infrequently disclosed to others when upset (i.e., low emotional expression) experienced more concurrent depressive symptoms than did boys (Schraedley, Gotlib, & Hayward, 1999). In another study, effortful engagement (i.e., emotional expression) predicted fewer depressive symptoms for female but not male young adults (Stanton, Danoff-Burg, Cameron, & Ellis; 1994). Research also shows that rumination (Butler & Nolen-Hoeksema, 1994) and co-rumination (i.e., dwelling on negative emotions and excessively discussing stressors with a friend; Rose, Carlson, & Waller, 2007) predict more depressive symptoms in females but not males. Thus, whereas effortful engagement, including emotional expression, may protect girls against depression, excessive and perhaps uncontrolled focus on negative emotions and stressors (i.e., involuntary engagement) may contribute to girls' depression. In another study, the combination of high levels of stressful life events and frequent use of effortful disengagement (avoidance coping) predicted depressive symptoms in female but not male young adults (Blalock & Joiner, 2000). Thus, we expected that maladaptive responses to stress would more strongly predict depression over time in girls than in boys.

Reciprocally, depression may have a greater negative impact on girls' than boys' ability to respond effectively to peer stress. Girls' relationships involve more intimate self-disclosure and exchange of emotional provisions than those of boys (Rose & Rudolph, 2006); thus, emotional resources are more critical for the maintenance of girls' than boys' relationships.

Because depression drains emotional resources and leads to social withdrawal, girls experiencing depression may feel overwhelmed and thus avoid engaging with peers to successfully resolve stressors. Indeed, depressive symptoms predict declines in the number of friendships and poorer perceived friendship quality in girls but not boys (Rudolph, Ladd, & Dinella, 2007). Moreover, female adults engage in more ruminative responses when in a depressed mood than male adults (Butler & Nolen-Hoeksema, 1994). Because rumination predicts increases in disengagement (Hong, 2007), depression also may cause girls to disengage more than boys from stressors. Thus, we expected that depression would more strongly predict maladaptive responses to stress over time in girls than in boys.

The Role of Stress Exposure

Finally, we examined the proposition that the proposed reciprocal-influence process would be stronger in the context of high than low levels of peer stress. Under high stress, responses that fail to successfully address or resolve stressors may lead youth to perceive themselves more negatively. In fact, youth with poor self-perceptions are more likely to develop depressive symptoms following high levels of negative life events (Hammen, 1998). Conversely, effortful engagement responses may protect against depression more strongly under high than low stress. For example, effective problem solving predicts fewer depressive symptoms in the context of high but not low stress (Nezu & Ronan, 1988). Reciprocally, depression may be more likely to tax youths' emotional resources and, consequently, lead to more maladaptive stress responses in the context of high than low stress. Indeed, greater regulatory control of emotions is correlated with adaptive coping in high but not low stress conditions (Fabes & Eisenberg, 1997).

Study Overview

Drawing from transactional interpersonal models of depression, this study used a prospective design to test the hypothesis that depression would predict maladaptive responses to peer stress over time, and maladaptive responses to peer stress would predict subsequent depression. This reciprocal-influence process was expected to be amplified in girls and in the context of high peer stress. The model was examined during late preadolescence and early adolescence. Considering that peer relationships assume great importance in youths' development (Rubin, Bukowski, & Parker, 1998) and sex differences in peer relationship processes tend to intensify (Rose & Rudolph, 2006) during this stage, responding effectively to peer stress may have especially critical implications for depression and its consequences. We also examined whether the proposed model was specific to depression relative to anxiety and externalizing psychopathology.

Method

Participants and Procedures

Participants were 167 youth (86 girls, 81 boys; M age = 12.41 years; SD = 1.19) and their female caregivers recruited from several Midwestern towns in the United States based on school-wide screenings with the Children's Depression Inventory (CDI; Kovacs, 1992). Families represented several ethnic groups (77.8% White, 12.6% African American, and 9.6% other) and were diverse in socioeconomic class (annual family income: 16.7% below $30,000, 48.7% $30,000-59,999, 21.6% $60,000-89,999, and 13.0% over $90,000). Youth who participated in the screenings represented 80% of participants initially targeted for screening. From the screening sample (n = 1985), we selected potential participants along the range of the CDI, over-sampling slightly for youth with scores above 18 (the recommended cutoff for severe depressive symptoms; Kovacs, 1992); whereas 15.8% of the screening sample had CDI scores above 18, 20.3% of the participants we targeted for recruitment fell into this category. Other than the oversampling, families were randomly

called until the targeted sample was recruited. Of the families who were called, those who did versus did not participate did not differ in sex, $\chi^2(1) = .39$, *ns*, ethnicity (white vs. minority), $\chi^2(1) = .02$, *ns*, or CDI screening scores, $t(280) = 1.11$, *ns*. Participants ($M = 12.41$) were slightly younger than nonparticipants ($M = 12.65$), $t(275) = 2.28$, $p < .05$. Reasons for nonparticipation included being busy or not interested ($n = 229$), having moved or being unreachable ($n = 40$), chronic rescheduling ($n = 5$), and failing to meet eligibility criteria (i.e., having an English speaking maternal caregiver in the home and proximity to the university; $n = 27$).

Depression scores based on clinical interview data were available for 167 participants (100%) at Wave 1 (W_1), 159 participants (95%) at Wave 2 (W_2), and 158 participants (95%) at Wave 3 (W_3). Responses to stress scores were available for 165 participants (99%) at W_1, 150 participants (90%) at W_2, and 140 participants (84%) at W_3. Youth with complete data ($n = 135$) did not significantly differ from those missing data (W_2 only: $n = 5$; W_3 only: $n = 14$; W_2 and W_3: $n = 13$) in age, $t(165) = .77$, *ns*, ethnicity, $\chi^2(1) = .82$, *ns*, W_1 depression, $t(165) = 1.41$, *ns*, W_1 effortful engagement, $t(163) = -1.79$, *ns*, W_1 effortful disengagement, $t(163) = .07$, *ns*, or W_1 involuntary engagement, $t(163) = 1.32$, *ns*. Participants missing data at W_2 and/or W_3 reported more involuntary disengagement at W_1 ($M = .17$, $SD = .03$) than participants with complete data ($M = .16$, $SD = .03$), $t(163) = 2.39$, $p < .05$, and were more likely to be boys, $\chi^2(N = 167, df = 1) = 8.66$, $p < .01$.

Families were recruited through phone calls to the primary female caregivers of children who had participated in the screening. Interested families completed a three- to four-hour assessment that involved completion of clinical diagnostic and life stress interviews and a series of questionnaires. After providing written informed consent/assent, caregivers and youth were interviewed separately. Two follow-up interviews occurred at one-year intervals. At each assessment, families were compensated with a monetary reimbursement ($25-70; amount increased at each follow-up), and youth received a gift certificate ($10).

Measures

Depression—Interviewers administered the Schedule for Affective Disorders and Schizophrenia for School-Age Children-Epidemiologic Version-5 (K-SADS-E; Orvaschel, 1995) individually to youth and caregivers to assess youth depression. Interviewers were a faculty member in clinical psychology, a post-doctoral student in clinical psychology, several psychology graduate students, and a post BA-level research assistant. Coding took place through consultation with a clinical psychology faculty member or post-doctoral student; consensual diagnoses were collectively assigned using a best-estimate approach (Klein, Ouimette, Kelly, Ferro, & Riso, 1994), which combines all available caregiver and youth data following specific guidelines for resolving discrepancies (e.g., weighting of caregiver or youth report depending on clinical judgments regarding validity).

Interviewers used the Diagnostic and Statistical Manual of Mental Disorders criteria (DSM-IVTR; American Psychiatric Association, 2000) to assign ratings of depressive symptoms on a 5-point scale: 0 = No symptoms, 1 = Mild symptoms, 2 = Moderate symptoms, 3 = Diagnosis with mild to moderate impairment, and 4 = Diagnosis with severe impairment. In line with DSM-IV criteria, these ratings considered the number, severity, frequency, duration, and resulting impairment of the reported symptoms to determine whether they met sufficient threshold for diagnosis. Subthreshold symptoms (i.e., mild or moderate) reflected the presence of symptoms that failed to meet one or more of the DSM criteria (e.g., the youth had fewer than the required number of symptoms or had the required number of symptoms for less than the required duration). Separate ratings were assigned for each type of depression based on both diagnosable and subthreshold symptoms during the past month. Diagnoses consisted of major depressive disorder and dysthymia (and one diagnosis of

recurrent brief depressive disorder). A few of the youth with subsyndromal depression ($n = 9$) experienced symptoms of adjustment disorder with depressed mood, depressive disorder NOS, and bereavement. Ratings were summed across the diagnostic categories for each individual to create continuous depression scores, such that higher ratings reflect more severe symptoms within a single diagnostic category and/or the presence of symptoms from multiple categories (for similar approaches, see Hammen, Shih, Altman, & Brennan, 2003).

Providing evidence for concurrent validity, these scores were significantly correlated with CDI (Kovacs, 1992) and Youth Depression Inventory (Rudolph, 2002) scores (rs = .46 - .57, ps < .01). Consistent with the use of this continuous index, contemporary conceptualizations of depression, derived in part from taxometric analyses, suggest that depression is best represented on a dimensional continuum rather than as a discrete category (Hankin, Fraley, Lahey, & Waldman, 2005). Post-doctoral and graduate students independently coded audiotapes of 25% of the interviews, yielding strong inter-rater reliability (one-way random-effects intraclass correlation coefficient [ICC] = .98).

At W_1, 12.0% (11.1% of boys and 12.8% of girls) experienced diagnostic-level symptoms within the past month (a rating of 3 or 4); an additional 13.2% (13.6% of boys and 12.8% of girls) experienced mild or moderate symptoms (a rating of 1 or 2). At W_2, 9.4% (7.8% of boys and 11.0% of girls) experienced diagnostic-level symptoms within the past month; an additional 17.6% (18.2% of boys and 17.1% of girls) experienced mild or moderate symptoms. At W_3, 7.0% (7.9% of boys and 6.1% of girls) experienced diagnostic-level symptoms within the past month; an additional 16.5% (14.5% of boys and 18.3% of girls) experienced mild or moderate symptoms. Thus, a substantial minority of participants experienced depressive symptoms over the course of the study.

Responses to peer stress—Youths completed the peer stressor version of the Responses to Stress Questionnaire (RSQ; Connor-Smith et al., 2000), a 57-item measure assessing effortful coping and involuntary responses to stress. The RSQ includes four subscales: effortful engagement (such as problem solving and emotion regulation; e.g., "I do something to try to fix the problem or take action to change things"; αs = .86 - .90 across waves), effortful disengagement (such as denial and voluntary avoidance; e.g., "I **try** to stay away from people and things that make me feel upset or remind me of the problem"; αs = .78 - .82 across waves), involuntary engagement (such as rumination and physiological arousal; e.g., "I keep remembering what happened or can't stop thinking about what might happen"; αs = .90 - .93 across waves), and involuntary disengagement (such as inaction and escape/involuntary avoidance; e.g., "I just **have** to get away when I have problems with other kids, I can't stop myself"; αs = .87 - .89 across waves).

Youth were presented with a list of nine peer stressors (e.g., being teased or hassled by other kids, not having as many friends as you want) and checked which of these stressors they had experienced since the start of the school year. They were then instructed to rate the frequency with which they engaged in different responses to these stressors on a 4-point scale. Consistent with prior research (Connor-Smith et al., 2000; Flynn & Rudolph, 2007), to correct for base-rate differences, proportion scores were calculated as the total score for each of the four subscales divided by the total score on the RSQ. This scoring method provides an index of how much individuals engage in a particular type of response relative to other responses (Vitaliano, Maiuro, Russo, & Becker, 1987). Convergent validity and test-retest reliability have been established (Connor-Smith et al., 2000).

Peer stress—Interviewers administered the Youth Life Stress Interview (Rudolph & Flynn, 2007) to youth and caregivers to assess youths' exposure to peer stress during the preceding year. This semi-structured interview uses detailed probes to elicit objective

information from caregivers and youth about ongoing stress (e.g., teasing, social isolation, poor quality friendships) and specific events (e.g., a physical fight with a peer, a friend moving away) over the past year. Detailed follow-up questions were asked about the timing, duration, and context of stress. Interviewers presented narrative information to a team of trained coders who had no knowledge of the youth's diagnostic status or subjective response to the stress. Coders provided consensual ratings based on youth and caregiver reports using a best-estimate approach. Chronic stress was rated on a 5-point scale: 1=No stress, 2=Mild stress, 3=Isolated stress, 4=Serious stress, 5=Severe stress. For episodic stress, coders rated the stressfulness or negative impact of each event, from 1 (none) to 5 (severe), reflecting how stressful the event would be for a typical child in the described circumstances. If only the youth or the caregiver reported an event, that information was used for coding. Episodic peer stress scores were calculated as the total of the objective stress ratings for each peer event with a stress rating above 1.

To determine reliability, two independent teams coded 160 life events. One-way random-effects intra-class correlation coefficients revealed high reliability for chronic stress (ICC = .96) and episodic stress (ICC = .90). Cohen's kappa for agreement on whether an event was peer-related or not was 1.00. A composite peer stress score was created by standardizing and averaging chronic and episodic ratings separately within each wave, and then averaging across waves to provide an index of stress over the course of the study,

Results

Preliminary Analyses

Table 1 presents descriptive data. A repeated-measures multivariate analysis of variance was conducted with sex as a between-subjects factor and wave as a within-subjects factor. This analysis revealed a significant multivariate main effect of sex, $F(6, 127) = 2.28$, $p < .05$, and nonsignificant effects of wave, $F(12, 121) = 1.21$, ns, and the Sex x Wave interaction, $F(12, 121) = 1.40$, ns. Examination of the univariate effects revealed a significant main effect of sex for effortful engagement, $F(1,132) = 5.89$, $p < .05$, effortful disengagement, $F(1, 132) = 4.76$, $p < .05$, and involuntary disengagement, $F(1, 132) = 8.38$, $p < .01$. Girls ($M = .50$, $SD = .08$) reported more effortful engagement than did boys ($M = .47$, $SD = .07$). Boys ($M = .14$, $SD = .03$) reported more effortful disengagement than did girls ($M = .14$, $SD = .03$), and boys ($M = .16$, $SD = .03$) reported more involuntary disengagement than did girls ($M = .15$, $SD = .03$). No sex differences were found for involuntary engagement, $F(1, 132) = 1.45$, ns, depression, $F(1, 132) = .20$, ns, or peer stress, $F(1, 132) = .16$, ns. The sex differences in stress responses are consistent with prior research suggesting proportionately more effortful engagement in females and more involuntary disengagement in males (Connor-Smith et al., 2000). The absence of sex differences in depression and peer stress is likely due to the fact that these sex differences emerge during mid adolescence (about age 13; Rudolph & Hammen, 1999) and are associated with the onset of puberty (Ge, Conger, & Elder, 2001), and more than half of the present sample (64.7%) was younger than 13 years old. Table 2 presents cross-wave correlations between responses to stress and depression.

Tests of the Hypothesized Reciprocal-Influence Model

Path analyses were conducted with AMOS Version 7.0 (Arbuckle, 2006) to examine the transactional associations between responses to stress and depression. These analyses allow for multiple variables within a network to be simultaneously modeled and they provide an index of fit of the overall model and the relative fit of the model across groups using multi-group comparisons. AMOS uses the full information maximum likelihood (FIML) estimation method to handle missing data (Arbuckle, 2006). At each wave, depression was represented by a manifest variable reflecting the continuous scores derived from the K-

SADS. Responses to stress were represented by manifest variables reflecting the four subscales of the RSQ. Separate models were tested for each of the four types of responses to stress. As shown in Figure 1, the models included cross-lagged paths reflecting the hypothesized transactional associations between responses to stress and depression, and autoregressive paths reflecting the stability of the variables over time. The models also included the within-wave correlation between responses to stress and depression at W_1 to capture the initial shared variance between these variables. Finally, the error variances for the same measures at W_2 and W_3 were allowed to correlate to capture shared method variance.

Moderation by sex—To examine the moderating effect of sex, we conducted multi-group comparison analyses. Specifically, we compared a constrained model (one in which the paths of interest were set to be equal across sex) with an unconstrained model (one in which the paths of interest were allowed to vary across sex). To assess model fit, we examined the χ^2/df ratios, the Comparative Fit Index (CFI; Bentler, 1990), the Incremental Fit Index (IFI; Bollen, 1990), and the Root Mean Square Error of Approximation (RMSEA; Steiger, 1990). Good model fit is reflected in χ^2/df ratios of less than 2.5 or 3 (Kline, 1998), CFI and IFI values above .90 (Bentler, 1990; Bollen, 1990; Kline, 1998), and RMSEA values of .05 to .08 (Browne & Cudeck, 1993). We used χ^2 difference tests to compare the fit of the constrained versus unconstrained models.

Consistent with expectations, χ^2 difference tests revealed that the unconstrained model fit significantly better than the constrained model for effortful engagement, $\Delta\chi^2(4) = 10.01$, $p < .05$, and involuntary disengagement, $\Delta\chi^2(4) = 15.08$, $p < .01$. There were no significant differences between the fit of the unconstrained and constrained models for effortful disengagement, $\Delta\chi^2(4) = 6.19$, ns, and involuntary engagement, $\Delta\chi^2(4) = 2.65$, ns; consequently, paths for these models were not interpreted. The fit of the unconstrained models was generally good (effortful engagement: $\chi^2(8) = 12.84$, ns, χ^2/df = 1.60, CFI = .99, IFI = .99, RMSEA = .06; effortful disengagement: $\chi^2(8) = 15.79$, $p < .05$, χ^2/df = 1.97, CFI = .98, IFI = .98, RMSEA = .08; involuntary engagement: $\chi^2(8) = 24.05$, $p < .00$, χ^2/df = 3.01, CFI = .96, IFI = .96, RMSEA = .11; involuntary disengagement: $\chi^2(8) = 12.26$, ns, χ^2/df = 1.53, CFI = .99, IFI = .99, RMSEA = .06).

Figure 1 displays the standardized path coefficients in girls and boys. In girls but not boys, W_1 effortful engagement predicted less W_2 depression, and W_2 effortful engagement predicted less W_3 depression. Also in girls but not boys, W_1 involuntary disengagement predicted more W_2 depression, and W_2 involuntary disengagement predicted more W_3 depression. In boys but not girls, W_1 depression predicted less W_2 effortful engagement and more W_2 involuntary disengagement.

Moderation by stress—To examine the moderating effect of peer stress, we created high and low peer stress groups using the median of the standardized peer stress composite. We then compared constrained and unconstrained models and used χ^2 difference tests to compare the fit across model. Consistent with expectations, χ^2 difference tests revealed that the unconstrained model fit significantly better than the constrained model for effortful engagement, $\Delta\chi^2(4) = 10.21$, $p < .05$, and involuntary disengagement, $\Delta\chi^2(4) = 19.41$, $p < .001$. There were no significant differences between the fit of the unconstrained and constrained models for effortful disengagement, $\Delta\chi^2(4) = 3.98$, ns, and involuntary engagement, $\Delta\chi^2(4) = 4.47$, ns; consequently, paths for these models were not interpreted. The fit of the unconstrained models was generally good (effortful engagement: $\chi^2(8) = 9.76$, ns, χ^2/df = 1.22, CFI = 1.00, IFI = 1.00, RMSEA = .04; effortful disengagement: $\chi^2(8) = 12.53$, ns, χ^2/df = 1.57, CFI = .98, IFI = .99, RMSEA = .06; involuntary engagement: $\chi^2(8) =$

13.48, $p < .10$, χ^2/df = 1.69, CFI = .98, IFI = .99, RMSEA = .07; involuntary disengagement: $\chi^2(8) = 9.44$, ns, χ^2/df = 1.18, CFI = 1.00, IFI = 1.00, RMSEA = .03).

Figure 2 displays the standardized path coefficients in high and low peer stress groups. In both the high and low stress groups, W_1 effortful engagement predicted less W_2 depression and W_1 involuntary disengagement predicted more W_2 depression, but the effects were larger in the high stress group. In the high but not low stress group, W_2 effortful engagement predicted less W_3 depression and W_2 involuntary disengagement predicted more W_3 depression.

Specificity analyses—To examine whether our results were specific to depressive symptoms or also may be associated with other forms of psychopathology, two parallel sets of analyses were conducted examining the association between stress responses and both anxiety and externalizing psychopathology (based on similar ratings as depression using the K-SADS interview). Of 16 multi-group comparisons (8 for anxiety, 8 for externalizing), only one (i.e., sex comparison for anxiety and involuntary engagement) yielded a significant difference; however, there were no significant paths for either girls or boys in the unconstrained model.

Discussion

This study yielded partial support for the hypothesis that maladaptive responses to peer stress predict depression, especially in girls and in the context of high peer stress. Support also was found for the hypothesis that depression predicts maladaptive responses to peer stress; however, this effect emerged only in boys and was less consistent. Notably, important differences emerged across types of responses, with the most consistent effects for effortful engagement and involuntary disengagement. Finally, specificity analyses revealed that significant associations did not emerge for anxiety and externalizing psychopathology.

Responses to Stress and Depression in Girls

In girls, adaptive responses (effortful engagement) predicted less depression at each wave, whereas maladaptive responses (involuntary disengagement) predicted more depression at each wave; thus, responses to peer stress may be more important for girls' than boys' emotional well-being. Given that girls are more likely than boys to seek emotional support in response to stress (Rose & Rudolph, 2006), they may rely on this support to weather interpersonal difficulties. Girls who respond to peer stress through involuntary avoidance show heightened depression, whereas girls who actively engage with stressors or seek support to resolve associated emotions are protected against depression.

Inconsistent with our hypotheses, depression did not undermine responses to peer stress in girls. However, several of the zero-order cross-wave correlations were significant in girls: W_1 depression predicted more W_2 involuntary disengagement, and W_2 depression predicted less W_3 effortful engagement and more W_3 involuntary engagement and disengagement. Thus, it is possible that stability in stress responses partially explains why depression did not predict maladaptive stress responses in girls after adjusting for earlier responses. Alternatively, girls' stress responses may be predicted by other factors, such as cognitive appraisals (Amirkhan, 1998; Shelton & Harold, 2008) or other stable personality characteristics (e.g., temperament; Compas, Connor-Smith, & Jaser, 2004) rather than by fluctuations in depression.

Responses to Stress and Depression in Boys

In boys, depression predicted less adaptive (effortful engagement) and more maladaptive (involuntary disengagement) responses but only from W_1 to W_2, suggesting that depression and associated deficits may hinder boys' ability to respond effectively to peer stress. In boys but not girls, depression is linked to deficits in the ability to identify nonverbal emotional cues in others (Nowicki & Carton, 1997), suggesting that depressed boys have emotion processing deficits that may impair their stress responses. Depressed males also show more anger, aggression, and hostility than do depressed females (Fava, Nolan, Kradin, & Rosenbaum, 1995; Renouf & Harter, 1990); in turn, anger and aggression may hinder the production of adaptive stress responses. In fact, aggressive children show fewer assertive, planful, and prosocial responses (e.g., less effortful engagement) to peer conflicts (Dodge, 1993). Thus, sex-specific, depression-linked emotion processing deficits and aggression may help to explain why depression predicted maladaptive stress responses in boys but not girls.

Moderation by Stress Exposure

Building on prior research that commonly examines responses to stress in the absence of knowledge about stress levels, this study also revealed that certain stress responses (effortful engagement and involuntary disengagement) more strongly predicted subsequent depression in the context of high than low peer stress. Not surprisingly, how youth respond to peer stress has a stronger impact on depression when they are faced with more severe challenges. It may be that youths' responses are merely more relevant when they encounter severe than minor stress, or that failure to effectively address severe stress has stronger implications for youths' self-evaluations or for how peers react to youth in ways that increase or decrease risk for depression. Stress level did not moderate the contribution of depression to subsequent stress responses, perhaps because this direction of effect was relevant only in boys or because stress responses are better predicted by factors other than fluctuations in depression.

Limitations

A few limitations of this study should be noted. First, although a substantial minority of the sample experienced depressive symptoms over the course of the study, the majority of participants were not severely depressed. Evidence for the dimensional nature of depressive symptoms (Hankin et al., 2005) would lead us to predict replication in youth with diagnostic-level depression, but future research needs to test this hypothesis. Second, youth experiencing depression also may provide less accurate reports on stress responses; specifically, mood-congruent memory (Murray, Whitehouse, & Alloy, 1999) may cause selective recall of maladaptive responses. Although our assessment of depression and exposure to peer stress integrated youth and caregiver reports, responses to peer stress were assessed through self-report; future research would benefit from a multi-informant, multi-method approach to assessing stress responses. Third, our sample size prevented us from simultaneously examining the role of sex and stress exposure as moderators; it will be interesting to examine whether the observed linkages are particularly salient in girls experiencing high levels of stress. Finally, although we focused on a developmental period during which the peer context is especially salient, many of the youth were at a stage during which girls' rates of depression just begin to rise; thus, future research is needed to determine whether responses to peer stress contribute to the growing sex difference in depression during mid- to late adolescence.

Implications for Theory, Research, and Practice

Consistent with interpersonal models of depression (Hammen, 2006; Joiner et al., 1999; Rudolph, 2009), our findings revealed bi-directional associations between youths' responses

to their social environment and depression, although the significant direction of effect varied across girls and boys. Engaging in fewer effortful, planful responses and more involuntary, dysregulated responses predicted more depression in girls but not boys, whereas depression predicted fewer effortful, planful responses and more involuntary, dysregulated responses in boys but not girls. These findings help clarify the direction of association between stress responses and depression, as well as how sex and stress exposure moderate these associations. Considering that most coping studies do not include measurement of actual stress exposure, we consider this to be a significant strength of the study.

Because our study focused on the peer context, it is not clear whether these findings would generalize to other types of stress. Compared to girls, boys generally experience more stress within noninterpersonal contexts (e.g., athletics) and less stress within interpersonal contexts (Rudolph & Hammen, 1999); it is possible, therefore, that noninterpersonal stressors are more salient in boys, and thus responses to these stressors are relevant to understanding boys' depression. Further research is needed to elucidate how sex moderates the association between depression and responses to stress within different life domains. On a related note, the adaptiveness of various responses to stress may depend on the type of stressor (Compas et al., 2001; Rudolph, Dennig, & Weisz, 1995). Because peer stressors are generally perceived as more controllable by youth than other interpersonal stressors (e.g., family stressors; Griffith, Dubow, & Ippolito, 2000), we expected that engagement responses would be more adaptive than disengagement responses. However, for uncontrollable stressors, disengagement responses such as avoidance or inaction actually may represent more adaptive strategies (Forsythe & Compas, 1987).

Research also needs to identify the processes through which stress responses contribute to depression, and depression contributes to stress responses, as well as sex differences in these processes. For example, girls who fail to effectively resolve peer stressors may evaluate themselves negatively or generate disapproval and additional stress in their relationships, thereby making them vulnerable to depression, whereas depressed boys may show more nonverbal processing deficits and aggression, thereby fostering maladaptive responses to stress. Studies that directly examine these or other plausible pathways would advance our understanding about how the interplay between maladaptive responses to stress and depression unfolds across development.

This research suggests that certain maladaptive stress responses make a greater contribution to girls' than boys' depression, whereas depression has a greater impact on boys' than girls' ability to produce adaptive stress responses. Thus, the type and point of interventions to address youth depression may need to differ by sex. Specifically, targeting maladaptive stress responses may be more effective in reducing girls' than boys' risk for depression, whereas targeting boys' depressive symptoms may help them to develop more adaptive stress responses, thereby supporting the establishment of healthy relationships that would be protective against depression.

References

Abramson LY, Seligman ME, Teasdale JD. Learned helplessness in humans: Critique and reformulation. Journal of Abnormal Psychology. 1978; 87:49–74. [PubMed: 649856]

American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th ed.. Author; Washington, DC: 2000. Text Revision

Amirkhan JH. Attributions as predictors of coping and distress. Personality and Social Psychology Bulletin. 1998; 24:1006–1018.

Arbuckle, JL. AMOS 7.0 [Computer Software]. Small Waters Corp.; Chicago: 2006.

Bell-Dolan DJ, Reaven NM, Petersen L. Depression and social functioning: A multidimensional study of the linkages. Journal of Clinical Child Psychology. 1993; 22:306–315.

Bentler PM. Comparative fit indexes in structural models. Psychological Bulletin. 1990; 107:238–246. [PubMed: 2320703]

Blalock JA, Joiner TE. Interaction of cognitive avoidance coping and stress in predicting depression/ anxiety. Cognitive Therapy and Research. 2000; 24:47–65.

Bollen KA. Overall fit in covariance structure models: Two types of sample size effects. Psychological Bulletin. 1990; 107:256–259.

Browne, MW.; Cudeck, R. Alternative ways of assessing model fit.. In: Bollen, KA.; Long, JS., editors. Testing structural equation models. Sage Publications; New York, NY: 1993.

Butler LD, Nolen-Hoeksema S. Gender differences in responses to depressed mood in a college sample. Sex Roles. 1994; 30:331–346.

Cicchetti D, Toth SL. The development of depression in children and adolescents. American Psychologist. 1998; 53:221–241. [PubMed: 9491749]

Compas BE, Connor-Smith J, Jaser SS. Temperament, stress reactivity, and coping: Implications for depression in childhood and adolescence. Journal of Clinical Child and Adolescent Psychology. 2004; 33:21–31. [PubMed: 15028538]

Compas BE, Connor-Smith JK, Saltzman H, Thomsen AH, Wadsworth ME. Coping with stress during childhood and adolescence: Progress, problems and potential in theory and research. Psychological Bulletin. 2001; 127:87–127. [PubMed: 11271757]

Connor-Smith JK, Compas BE, Wadsworth ME, Thomsen AH, Saltzman H. Responses to stress in adolescence: Measurement of coping and involuntary stress responses. Journal of Consulting and Clinical Psychology. 2000; 68:976–992. [PubMed: 11142550]

Dodge KA. Social-cognitive mechanisms in the development of conduct disorder and depression. Annual Review of Psychology. 1993; 44:559–584.

Fabes RA, Eisenberg N. Regulatory control and adults' stress-related responses to daily life events. Journal of Personality and Social Psychology. 1997; 73:1107–1117. [PubMed: 9364764]

Fava M, Nolan S, Kradin R, Rosenbaum JE. Gender differences in hostility among depressed and medical outpatients. Journal of Nervous and Mental Disease. 1995; 183:10–14. [PubMed: 7807063]

Flynn M, Rudolph KD. Perceptual asymmetry and youths' responses to stress: Understanding vulnerability to depression. Cognition & Emotion. 2007; 21:773–788.

Forsythe CJ, Compas BE. Interaction of cognitive appraisals of stressful events and coping: Testing the goodness of fit hypothesis. Cognitive Therapy and Research. 1987; 11:473–485.

Garber, J.; Martin, NC. Negative cognitions in offspring of depressed parents: Mechanisms of risk.. In: Goodman, SH.; Gotlib, IH., editors. Children of depressed parents: Mechanisms of risk and implications for treatment. American Psychological Association; Washington, D.C.: 2002. p. 121-154.

Garber J, Weiss B, Shanley N. Cognitions, depressive symptoms, and development in adolescents. Journal of Abnormal Psychology. 1993; 102:47–57. [PubMed: 8436699]

Ge X, Conger RD, Elder GH. Pubertal transition, stressful life events, and the emergence of gender differences in adolescent depressive symptoms. Developmental Psychology. 2001; 37:404–417. [PubMed: 11370915]

Griffith MA, Dubow EF, Ippolito MF. Developmental and cross-situational differences in adolescents' coping strategies. Journal of Youth and Adolescence. 2000; 29:183–204.

Hammen C. Self-cognitions, stressful events, and the prediction of depression in children of depressed mothers. Journal of Abnormal Child Psychology. 1988; 16:347–360. [PubMed: 3403815]

Hammen C. Stress generation in depression: Reflections on origins, research, and future directions. Journal of Clinical Psychology. 2006; 62:1065–1082. [PubMed: 16810666]

Hammen C, Shih J, Altman T, Brennan PA. Interpersonal impairment and the prediction of depressive symptoms in adolescent children of depressed and nondepressed mothers. Journal of the American Academy of Child and Adolescent Psychiatry. 2003; 42:571–577. [PubMed: 12707561]

Hankin BL, Fraley RC, Lahey BB, Waldman ID. Is depression 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. 2005; 114:96–110. [PubMed: 15709816]

Herman-Stahl MA, Stemmler M, Petersen AC. Approach and avoidant coping: Implications for adolescent mental health. Journal of Youth and Adolescence. 1995; 24:649–665.

Hong RY. Worry and rumination: Differential associations with anxious and depressive symptoms and coping behavior. Behavioral Research and Therapy. 2007; 45:277–290.

Joiner, TE.; Coyne, JC.; Blalock, J. On the interpersonal nature of depression: Overview and synthesis.. In: Joiner, TE.; Coyne, JC., editors. The interactional nature of depression. American Psychological Association; Washington, DC: 1999.

Klein DL, Lewinsohn PM, Seeley JR. Psychosocial characteristics of adolescents with a past history of dysthymic disorder: Comparison with adolescents with past histories of major depressive and non-affective disorders, and never mentally ill controls. Journal of Affective Disorders. 1997; 42:127–135. [PubMed: 9105954]

Klein DN, Ouimette PC, Kelly HF, Ferro T, Riso LP. Test-retest reliability of team consensus best-estimate diagnoses of Axis I and II disorders in a family study. American Journal of Psychiatry. 1994; 151:1043–1047. [PubMed: 8010362]

Kline, RB. Principles and practice of structural equation modeling.. In: Kenny, DA., editor. Methodology in the social sciences. Series Ed.. Guilford; New York, NY: 1998.

Kochenderfer-Ladd B. Peer victimization: The role of emotions in adaptive and maladaptive coping. Social Development. 2004; 13:329–349.

Kovacs, M. Children's Depression Inventory Manual. Multi-Health Systems, Inc.; North Tonawanda, NY: 1992.

Krackow E, Rudolph KD. Life stress and the accuracy of cognitive appraisals in depressed youth. Journal of Clinical Child and Adolescent Psychology. 2008; 37:376–385. [PubMed: 18470774]

Murray LA, Whitehouse WG, Alloy LB. Mood congruence and depressive deficits in memory: A forced-recall analysis. Memory. 1999; 7:175–196. [PubMed: 10645378]

Nezu AM, Ronan GF. Social problem solving as a moderator of stress-related depressive symptoms: A prospective analysis. Journal of Counseling Psychology. 1988; 35:134–138.

Nolen-Hoeksema S, Girgus JS, Seligman ME. Predictors and consequences of childhood depressive symptoms: A 5-year longitudinal study. Journal of Abnormal Psychology. 1992; 101:405–422. [PubMed: 1500598]

Nolen-Hoeksema S, Stice E, Wade E, Bohon C. Reciprocal relations between rumination and bulimic, substance abuse, and depressive symptoms in adolescent females. Journal of Abnormal Psychology. 2007; 116:198–207. [PubMed: 17324030]

Nowicki S, Carton S. The relation of nonverbal processing ability of faces and voices and children's feelings of depression and competence. Journal of Genetic Psychology. 1997; 158:357–363. [PubMed: 9255962]

Orvaschel, H. Schedule for Affective Disorders and Schizophrenia for School-Age Children-Epidemiologic Version-5. Nova Southeastern University; 1995.

Quiggle NL, Garber J, Panak WF, Dodge KA. Social information processing in aggressive and depressed children. Child Development. 1992; 63:1305–1320. [PubMed: 1446554]

Reijntjes AH, Stegge H, Terwogt M. Children's coping with peer rejection: The role of depressive symptoms, social competence and gender. Infant and Child Development. 2006; 15:89–107.

Reijntjes AH, Stegge H, Terwogt M, Kamphuis JH, Telch MJ. Children's coping with in vivo peer rejection: An experimental investigation. Journal of Abnormal Child Psychology. 2006; 34:877–889. [PubMed: 17111114]

Renouf AG, Harter S. Low self-worth and anger as components of the depressive experience in young adolescents. Development and Psychopathology. 1990; 2:293–310.

Rose AJ, Carlson W, Waller EM. Prospective associations of co-rumination with friendship and emotional adjustment: Considering the socioemotional trade-offs of co-rumination. Developmental Psychology. 2007; 43:1019–1031. [PubMed: 17605532]

Rose A, Rudolph KD. A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. Psychological Bulletin. 2006; 132:98–131. [PubMed: 16435959]

Rubin, KH.; Bukowski, W.; Parker, JG. Peer interactions, relationships, and groups.. In: Eisenberg, N.; Damon, W., editors. Handbook of child psychology, 5th ed.: Vol. 3. Social, emotional, and personality development. John Wiley & Sons, Inc.; Hoboken: 1998. p. 619-700.

Rudolph KD. Gender differences in emotional responses to interpersonal stress during adolescence. Journal of Adolescent Health. 2002; 30:3–13. [PubMed: 11943569]

Rudolph, KD. The interpersonal context of adolescent depression.. In: Nolen-Hoeksema, S.; Hilt, LM., editors. Handbook of depression in adolescents. Routledge; New York: 2009. p. 377-418.

Rudolph KD, Clark AG. Conceptions of relationships in children with depressive and aggressive symptoms: Social-cognitive distortion or reality? Journal of Abnormal Child Psychology. 2001; 29:41–56. [PubMed: 11316334]

Rudolph KD, Dennig MD, Weisz JR. Determinants and consequences of children's coping in the medical setting: Conceptualization, review, and critique. Psychological Bulletin. 1995; 118:328–357. [PubMed: 7501740]

Rudolph KD, Flynn M. Childhood adversity and youth depression: Influence of gender and pubertal status. Development and Psychopathology. 2007; 19:497–521. [PubMed: 17459181]

Rudolph KD, Hammen C. Age and gender as determinants of stress exposure generation, and reactions in youngsters: A transactional perspective. Child Development. 1999; 70:660–677. [PubMed: 10368914]

Rudolph KD, Hammen C, Burge D. Interpersonal functioning and depressive symptoms in childhood: Addressing the issues of specificity and comorbidity. Journal of Abnormal Child Psychology. 1994; 22:355–371. [PubMed: 8064038]

Rudolph KD, Hammen C, Burge D. A cognitive-interpersonal approach to depressive symptoms in preadolescent children. Journal of Abnormal Child Psychology. 1997; 25:33–45. [PubMed: 9093898]

Rudolph, KD.; Hammen, C.; Daley, S. Adolescent mood disorders.. In: Wolfe, DA.; Mash, EJ., editors. Behavioral and Emotional Disorders in Adolescence: Nature, assessment, and treatment. Guilford; New York: 2006. p. 300-342.

Rudolph KD, Kurlakowsky KD, Conley CS. Developmental and social-contextual origins of depressive control-related beliefs and behavior. Cognitive Therapy and Research. 2001; 25:447–475.

Rudolph KD, Ladd G, Dinella L. Gender differences in the interpersonal consequences of early-onset depressive symptoms. Merrill-Palmer Quarterly. 2007; 53:461–488.

Sandler IN, Tein J, West SG. Coping, stress, and the psychological symptoms of children of divorce: A cross-sectional and longitudinal study. Child Development. 1994; 65:1744–1763. [PubMed: 7859552]

Schraedley PK, Gotlib IH, Hayward C. Gender differences in correlates of depressive symptoms in adolescents. Journal of Adolescent Heath. 1999; 25:98–108.

Shelton KH, Harold GT. Pathways between interparental conflict and adolescent psychological adjustment: Bridging links through children's cognitive appraisals and coping strategies. The Journal of Early Adolescence. 2008; 28:555–582.

Silk JS, Steinberg L, Morris AS. Adolescents' emotion regulation in daily life: Links to depressive symptoms and problem behavior. Child Development. 2003; 74:1869–1880. [PubMed: 14669901]

Stanton AL, Danoff-Burg S, Cameron CL, Ellis AP. Coping through emotional approach: Problems of conceptualization and confounding. Journal of Personality and Social Psychology. 1994; 66:350–362. [PubMed: 8195990]

Steiger JH. Structural model evaluation and modification: An interval estimation approach. Multivariate Behavioral Research. 1990; 25:173–180.

Steinberg L, Morris AS. Adolescent development. Annual Review of Psychology. 2001; 52:83–110.

Terry DJ, Hynes GJ. Adjustment to a low-control situation: Reexamining the role of coping responses. Journal of Personality and Social Psychology. 1998; 74:1078–92.

Thomsen AH, Compas BE, Colletti RB, Stanger C, Boyer MC, Konik BS. Parent reports of coping and stress responses in children with recurrent abdominal pain. Journal of Pediatric Psychology. 2002; 27:215–226. [PubMed: 11909929]

Vernberg EM. Psychological adjustment and experiences with peers during early adolescence: Reciprocal, incidental, or unidirectional relationships? Journal of Abnormal Child Psychology. 1990; 18:187–198. [PubMed: 2348032]

Vitaliano PP, Maiuro RD, Russo J, Becker J. Raw versus relative scores in the assessment of coping strategies. Journal of Behavioral Medicine. 1987; 10:1–18. [PubMed: 3585998]

Wadsworth ME, Berger LE. Adolescents coping with poverty-related family stress: Prospective predictors of coping and psychological symptoms. Journal of Youth and Adolescence. 2006; 35:57–70.

Wenz-Gross M, Siperstein GN, Untch AS, Widaman KF. Stress, social support, and adjustment of adolescents in middle school. Journal of Early Adolescence. 1997; 17:129–151.

Figure 1.

Path models examining sex differences in reciprocal associations between responses to stress and depression for (a) effortful engagement, (b) effortful disengagement, (c) involuntary engagement, and (d) involuntary disengagement. Path coefficients without parentheses are for girls; path coefficients in parentheses are for boys. *$p < .05$. **$p < .01$. ***$p < .001$.

(a) Effortful Engagement

(b) Effortful Disengagement

(c) Involuntary Engagement

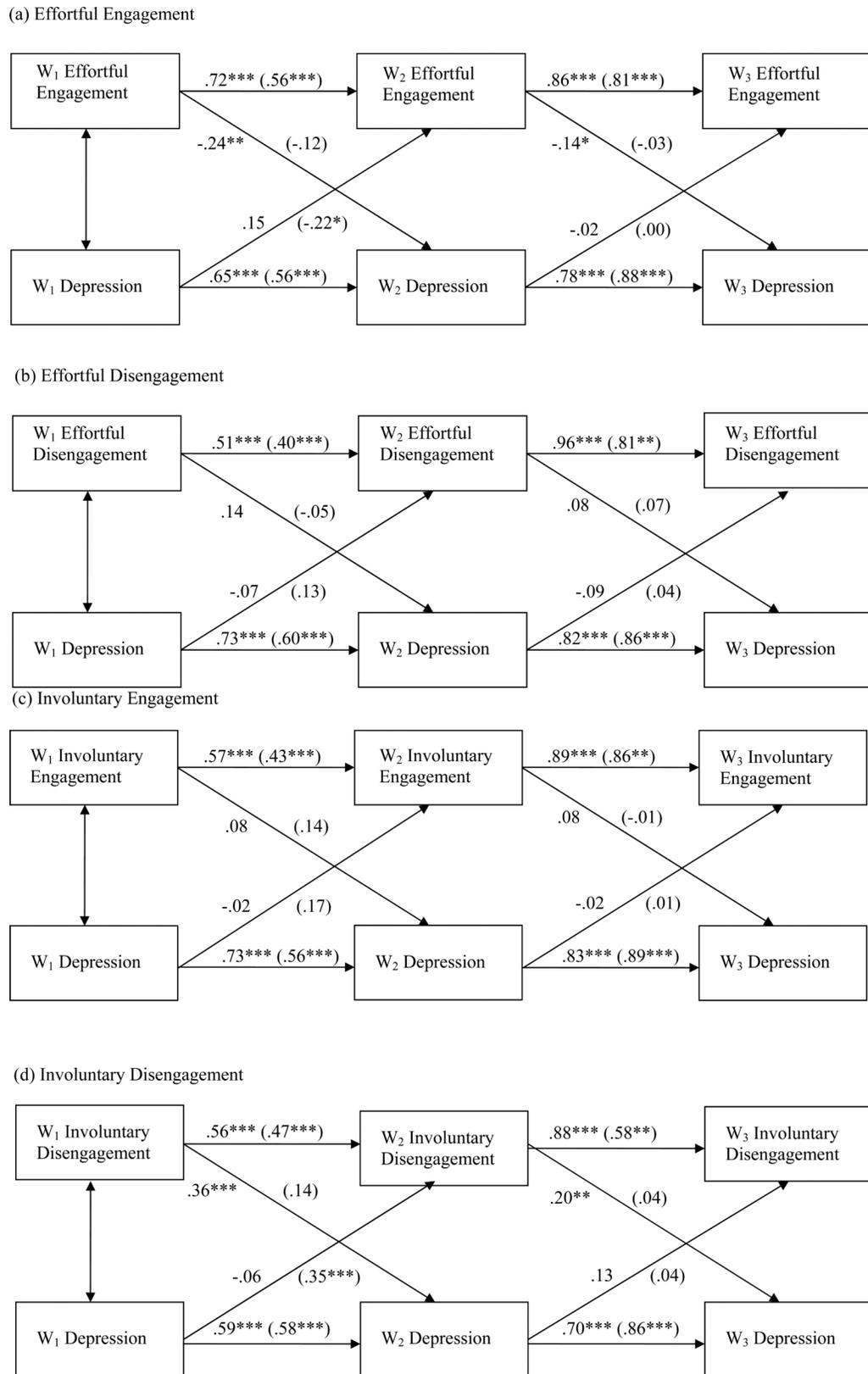(d) Involuntary Disengagement

Figure 2.
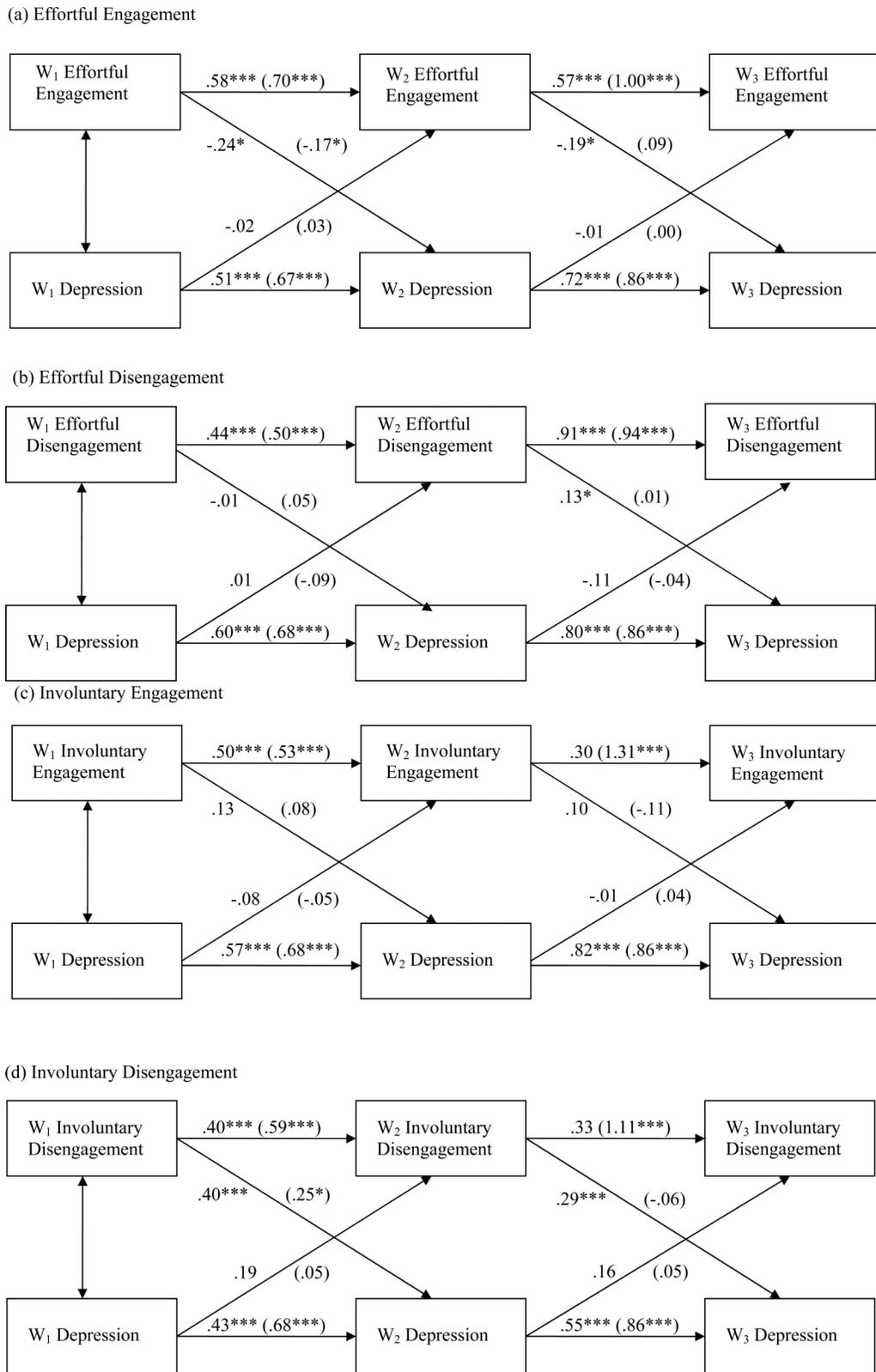
Path models examining stress level differences in reciprocal associations between responses to stress and depression for (a) effortful engagement, (b) effortful disengagement, (c) involuntary engagement, and (d) involuntary disengagement. Path coefficients without parentheses are for high peer stress; path coefficients in parentheses are for low peer stress. *p < .05. **p < .01. ***p < .001.

Table 1

Descriptive Statistics

Variable	Wave 1				Wave 2				Wave 3			
	Girls		Boys		Girls		Boys		Girls		Boys	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Depression	.67	1.41	.65	1.32	.70	1.39	.51	.98	.52	1.16	.49	1.05
Effortful Engagement	.48	.08	.46	.07	.50	.08	.47	.08	.51	.07	.47	.07
Effortful Disengagement	.14	.03	.15	.03	.13	.03	.14	.02	.14	.03	.14	.03
Involuntary Engagement	.23	.05	.23	.04	.21	.05	.22	.04	.21	.04	.23	.04
Involuntary Disengagement	.16	.04	.17	.03	.15	.03	.16	.03	.15	.03	.17	.03
Peer Stress	-.01	.92	.01	.83	-.05	.84	.04	.89	.01	.78	-.01	.94

Table 2

Intercorrelations Among the Variables

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. W$_1$ Depression	--	-.41**	.17	.31**	.41**	.62**	.74**	-.16	-.04	.17	.23*	.40**	.61**	-.11	-.03	.09	.18	.25*
2. W$_1$ Effortful Engagement	-.23*	--	-.62**	-.79**	-.84**	-.49**	-.52**	.67**	-.42**	-.60**	-.55**	-.37**	-.45**	.58**	-.32**	-.43**	-.55**	-.30**
3. W$_1$ Effortful Disengagement	.16	-.44**	--	.13	.57**	.16	.25	-.44**	.50**	.25*	.37**	.18	.21	-.35**	.47**	.09	.33**	.12
4. W$_1$ Involuntary Engagement	.23*	-.83**	.02	--	.42**	.46**	.31**	-.52**	.23*	.57**	.37**	.28*	.33**	-.48**	.11	.50**	.39**	.23*
5. W$_1$ Involuntary Disengagement	.08	-.78**	.07	.54**	--	.42**	.61**	-.55**	.32**	.46**	.53**	.36**	.45**	-.46**	.28*	.27*	.54**	.33**
6. W$_1$ Peer Stress	.44**	-.38**	.17	.41**	.14	--	.55**	-.32**	-.00	.43**	.23	.60**	.45**	-.38**	.09	.42**	.28*	.46**
7. W$_2$ Depression	.60**	-.26*	.04	.28*	.20	.35**	--	-.32**	.03	.35**	.33**	.52**	.82**	-.29**	-.03	.25*	.41**	.40**
8. W$_2$ Effortful Engagement	-.28*	.59**	-.31*	-.52**	-.40**	-.44**	-.16	--	-.63**	-.86**	-.87**	-.30**	-.39**	.73**	-.45**	-.62**	-.53**	-.17
9. W$_2$ Effortful Disengagement	.25*	-.24	.42**	.09	.04	.15	-.05	-.44**	--	.23*	.45**	.03	.10	-.45**	.56**	.21	.28*	.01
10. W$_2$ Involuntary Engagement	.10	-.47**	.12	.48**	.34**	.36**	.16	-.88**	.06	--	.63**	.36**	.36**	-.67**	.24*	.72**	.42**	.21
11. W$_2$ Involuntary Disengagement	.36**	-.62**	.27*	.54**	.46**	.44**	.21	-.87**	.23	.69**	--	.25*	.43**	-.59**	.35**	.40**	.57**	.15
12. W$_2$ Peer Stress	.49**	-.32**	.23*	.31**	.13	.57**	.59**	-.36**	.11	.34**	.32**	--	.53**	-.33**	.17	.33**	.20	.44**
13. W$_3$ Depression	.54**	-.23*	.14	.20	.15	.24*	.81**	-.17	.03	.11	.24*	.42**	--	-.33**	.09	.26*	.40**	.37**
14. W$_3$ Effortful Engagement	-.30*	.49**	-.44**	-.32*	-.29*	-.42**	-.20	.59**	-.32*	-.48**	-.53**	-.37**	-.35**	--	-.62**	-.81**	-.77**	-.22
15. W$_3$ Effortful Disengagement	.12	-.25*	.41**	.08	.11	.03	.06	-.34**	.47**	.18	.26	.06	.28*	-.62**	--	.17	.38**	.17
16. W$_3$ Involuntary Engagement	.38**	-.40**	.31*	.32*	.20	.45**	.18	-.53**	.18	.47**	.51**	.45**	.28*	-.84**	.24	--	.54**	.12
17. W$_3$ Involuntary Disengagement	.17	-.47**	.33**	.31*	.35**	.42**	.20	-.45**	.14	.40**	.42**	.28*	.23	-.82**	.34**	.54**	--	.24*
18. W$_3$ Peer Stress	.46**	-.24*	-.03	.35**	.12	.62**	.55**	-.30*	-.10	.33**	.34**	.54**	.48**	-.25*	.01	.31*	.19	--

Note. Correlations above the diagonal are for girls; correlations below the diagonal are for boys.

*
$p < .05.$

**
$p < .01.$