



Clarifying co-rumination: Associations with internalizing symptoms and romantic involvement among adolescent girls

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Abstract

Co-rumination, or excessive discussion of problems within friendships, has been associated with internalizing symptoms and is especially prevalent among adolescent girls. Eighty-three early adolescent girls participated in a prospective study further examining this construct. Co-rumination was positively correlated with depressive symptoms and positive aspects of friendship, but did not predict longitudinal changes in depressive symptoms. Co-rumination was negatively related to social anxiety when controlling for depressive symptoms. Co-rumination correlated positively with romantic experiences, and the two interacted to predict longitudinal changes in depressive symptoms, implying that co-rumination may only be depressogenic under certain circumstances. Theoretical ramifications for the construct of co-rumination and interpersonal aspects of adolescent internalizing symptoms are discussed.

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Introduction

Co-rumination (Rose, 2002) is defined as excessive discussion of problems within friendships, including repeated conversations, conjecture about causes, and heightened focus on negative emotions. The construct emerged in response to the apparent contradiction that although high

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quality friendships protect against internalizing symptoms (La Greca & Harrison, 2005), and girls tend to have closer and more disclosing friendships than boys (Furman & Buhrmester, 1992; McNelles & Connolly, 1999), girls remain more vulnerable to internalizing symptoms than boys. Based on the association between rumination and depression (e.g., Nolen-Hoeksema, 1991; Nolen-Hoeksema, Parker, & Larson, 1994), Rose (2002) proposed that co-rumination plays a role in the development of depression and anxiety, and showed that co-rumination is positively correlated with internalizing symptoms in a sample of children and adolescents. Rose also showed that girls co-ruminate more than boys, and that this becomes more pronounced in adolescence, coinciding with the emergence of gender differences in depression (Nolen-Hoeksema & Girgus, 1994). Rose demonstrated that co-rumination is positively correlated with positive friendship quality and closeness, counterintuitively suggesting that certain aspects of closeness in peer relationships may leave youth at risk for internalizing symptoms. In a follow-up to Rose's initial study, Rose, Carlson, and Waller (2007) also showed that co-rumination prospectively predicted increases in depressive symptoms and anxiety.

Rose's (2002) findings may have implications for understanding interpersonal etiological and maintenance factors in adolescent psychopathology. Co-rumination may help explain why adolescent girls are more likely than boys to become depressed (Nolen-Hoeksema & Girgus, 1994), and could potentially underlie peer contagion effects in depression (Stevens & Prinstein, 2005). Further, if co-rumination contributes to the development of internalizing symptoms, it may be an important point of intervention.

In addition, the notion that aspects of peer support have maladaptive effects has important implications for research on adolescent peer relations. Research has clearly linked supportive friendship with lower depression and loneliness and higher self-esteem, but there is debate over why this is the case (Savin-Williams & Berndt, 1990). Sullivan (1953) suggested that self-disclosure within "chumships" in early adolescence plays an integral role in identity formation, serving as the basis for the development of future relationships. In contrast, Mechanic (1983) argued that negatively focused self-disclosure may have harmful consequences, and that friendships are beneficial when they promote exciting activities that distract youth from their negatively focused thoughts. Better understanding co-rumination may provide insight into circumstances under which the consequences of friendship are maladaptive rather than positive.

Despite the theoretical importance of co-rumination, with one recent exception (Rose et al., 2007) no additional published research has replicated or extended Rose's (2002) findings, or examined further correlates of co-rumination. This leaves several important questions unanswered. First, it remains unclear whether co-rumination is a cause, consequence, or correlate of depressive symptoms. Second, although Rose et al. (2007) showed that co-rumination positively correlated with certain aspects of anxiety, it is uncertain whether other types of anxiety, such as social anxiety, show the same relationship to co-rumination. Finally, co-rumination is not the only aspect of peer functioning that is related to depressive symptoms, but how co-rumination is related to other important predictors is unknown.

Temporal sequence of co-rumination and depressive symptoms

It is unclear whether co-rumination reliably predicts changes in depressive symptoms over time. A recent study (Rose et al., 2007) did find that co-rumination predicted increases in depressive

symptoms in a large sample over 6 months. However, although results were statistically significant, effect sizes were small ($\beta = .07$, $\Delta R^2 = .0046$), suggesting they may be spurious or clinically insignificant. Because this issue is so critical to our understanding of co-rumination and its effects on depression, these results strongly require replication. The current study used longitudinal data to attempt to do so.

There are three ways in which co-rumination could relate to depressive symptoms over time. First, co-rumination could predict the emergence or worsening of symptoms, functioning as an etiologic or maintenance factor (as found by Rose et al., 2007). Ruminative coping, theoretically analogous to co-rumination, predicts increases in depression (Nolen-Hoeksema et al., 1994). If co-rumination were a dyadic version of rumination, we would expect co-rumination to show a similar relationship to depressive symptoms over time. Conversely, co-rumination may predict decreases in depressive symptoms. Depressed adolescents who co-ruminate may benefit from the support provided by friends (Licitra-Kleckler & Waas, 1993). Also, discussing problems with friends may help adolescents generate solutions and feel less overwhelmed. Similarly, self-disclosing about negative feelings may help adolescents feel closer to friends (Altman & Taylor, 1973; Collins & Miller, 1994) which in turn may help reduce depressive symptoms (La Greca & Harrison, 2005; Nangle, Erdley, Newman, Mason, & Carpenter, 2003). If so, co-rumination may be better conceptualized as an adaptive coping mechanism rather than a problematic behavior. Lastly, co-rumination may simply be a correlate of depression with no relationship to changes in symptoms over time.

Distinguishing types of internalizing symptoms

In her original study, Rose (2002) found a positive relation between co-rumination and internalizing distress, using items from children's depression and anxiety self-report scales. Rose justified grouping together depression and anxiety by noting that both showed similar correlations with gender and grade in school, and that the two constructs were highly correlated. Child and adolescent researchers commonly combine depression and anxiety into a single construct, as factor analyses have shown that the two tend to load on a single "internalizing" factor (Achenbach, 1978; Achenbach & Edelbrock, 1979). However, some evidence suggests that the factor structure of the symptoms of depression and anxiety shifts with age (Lahey et al., 2004). For example, Cole, Truglio, and Peeke (1997) found support for a one factor model in childhood, but showed that separate factors emerged by early adolescence, suggesting they are best examined separately.

In her recent follow-up study, Rose et al. (2007) conducted analyses looking separately at anxiety and depressive symptoms and showed that co-rumination predicts increases in each. Although this study took an important step towards understanding co-rumination's relation to anxiety, Rose et al.'s (2007) approach had limitations. First, the anxiety symptoms examined were limited in scope. Rose and colleagues (Rose, 2002; Rose et al., 2007) have exclusively relied on the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978) to assess anxiety. The RCMAS primarily assesses worry and physiological aspects of anxiety, which chiefly relate to generalized anxiety. However, anxiety takes many different forms, which are qualitatively distinct and thus may not show the same relationship to co-rumination as depression and generalized anxiety. Social anxiety seems particularly unlikely to be positively

related to co-rumination. Although social anxiety commonly co-occurs with depression (e.g., Brady & Kendall, 1992; Lewinsohn, Zinbarg, Seeley, Lewinsohn, & Sack, 1997), they show distinct interpersonal patterns (Alden, Bieling, Meleshko, Craig, & Dobson, 1995; Joiner & Metalsky, 1995; La Greca & Lopez, 1998; Starr & Davila, *in press*), and the same is likely to be true for co-rumination. Social anxiety is defined by social avoidance (American Psychiatric Association, 1994). Compared to their non-anxious peers, socially anxious adolescents have fewer friends and less intimacy and quality in their existing friendships (La Greca & Lopez, 1998; Vernberg, Abwender, Ewell, & Beery, 1992). Moreover, people with social anxiety are less likely to self-disclose (Alden & Bieling, 1998; Meleshko & Alden, 1993), a central component of co-rumination. Some evidence also suggests that socially anxious people tend to be dependent on the few relationships they manage to form (Darcy, Davila, & Beck, 2005), presumably in their attempt to maintain closeness with others. This dependency may lead to reluctance to discuss unpleasant matters for fear that friends might evaluate them negatively and reject them. Given these characteristics, it seems unlikely that symptoms of social anxiety would be positively correlated with co-rumination as depression is. Rose et al. (2007) also did not take into account the substantial comorbidity between anxiety and depression. Because depression and anxiety commonly co-occur, it may be important to control for depressive symptoms when examining social anxiety's independent relationship to co-rumination, as some evidence suggests that comorbid depression distorts the relationship between social anxiety and interpersonal variables (Starr & Davila, *in press*).

Relation to romantic experiences

Although there are a variety of peer factors that are related to depression (see La Greca, Davila, & Siegel, *in press*), one that may be particularly related to co-rumination is adolescent romantic experiences. Like co-rumination, romantic experiences are associated with adolescent depression (Davila, Steinberg, Kachadourian, Cobb, & Fincham, 2004; Joyner & Udry, 2000). Given the developmental salience of romantic experiences in early adolescence and the importance of peer influence on the formation of early romantic relationships (Brown, 1999; Connolly & Goldberg, 1999), it seems likely that co-ruminating teens would often discuss problems associated with romantic desires, experiences, and failures. Casually dating teens self-disclose to their friends more often than non-daters (Kuttler & La Greca, 2004), and adolescents may often turn first to their close friends for advice about romance and sexuality (Papini, Farmer, Clark, & Micka, 1990; Simon, Eder, & Evans, 1992). Thus, it seems reasonable that adolescents with more romantic experience would co-ruminate more. Furthermore, doing so might then lead to greater depressive symptoms. As such, co-rumination may serve as a mechanism in the association between romantic experiences and depressive symptoms. Dating may be stressful for many early adolescents, and responding to this stress with maladaptive support seeking behaviors may lead to or worsen depressive symptoms. Alternatively, co-rumination may act as a vulnerability factor that interacts with romantic experiences to predict depressive symptoms. That is, adolescent romantic experiences may be most depressogenic among girls who are prone to co-rumination. Similarly, co-rumination may predict more symptoms for romantically involved girls, as its negative focus and disruption of problem solving may especially impair those coping with romantic challenges.

The current study

In an attempt to replicate Rose and colleagues (Rose, 2002; Rose et al., 2007) findings, we: (1) examined co-rumination's cross-sectional association with depressive symptoms and positive friendship qualities, predicting that it would be positively correlated with both and (2) evaluated the longitudinal relationship between co-rumination and depressive symptoms. In an effort to extend knowledge of co-rumination in new directions, we explored several additional questions. First, we examined co-rumination's relation to social anxiety, expecting that when controlling for depressive symptoms, social anxiety symptoms would show the reverse relationship with co-rumination, so that higher anxiety is associated with lower co-rumination. In addition, we examined the relation between co-rumination and romantic experiences. We expected that more romantic experiences would be associated with greater co-rumination. We also examined whether co-rumination would mediate the association between romantic experiences and depressive symptoms, and whether co-rumination and romantic experiences interact to predict changes in depressive symptoms.

The study followed a sample of early adolescent girls over a one-year period. Compared to either boys or younger girls, adolescent girls are more vulnerable to depression (Kessler, Avenevoli, & Ries Merikangas, 2001; Lewinsohn, Hops, Roberts, & Seeley, 1993; Nolen-Hoeksema & Girgus, 1994; Twenge & Nolen-Hoeksema, 2002), are more likely to co-ruminate (Rose, 2002) and are more likely to develop depressive symptoms following co-rumination (Rose et al., 2007). Thus, co-rumination may be most salient and have the broadest implications for female adolescents.

Method

Participants

Eighty-three early adolescent girls participated with a parent as part of a larger study on adolescent relationships. Girls were recruited from a larger questionnaire study (female $n = 173$) of seventh and eighth graders in three school districts in Suffolk County, New York. We telephoned parents of all female questionnaire study participants to recruit for the current study, and of these, 80 were scheduled and 65 participated. To recruit additional participants, we obtained permission from one school district to include a recruitment flyer with the monthly newsletter. From this flyer, we recruited 18 additional families, for a total of 83.¹ Girls with severe learning disabilities impairing ability to comprehend questionnaires were excluded, although no girls met this criterion.

¹Because it was important that a sufficient number of girls with depressive symptoms would participate, we first contacted parents of girls with higher (22+) questionnaire study CES-D scores, although we eventually contacted all parents of female participants of the questionnaire study. Girls recruited from the questionnaire study did not differ from girls recruited from the flyer on co-rumination or socio-demographic variables. Girls recruited from the questionnaire study did show somewhat higher CES-D scores ($M = 14.08$, $SD = 12.48$) than girls recruited from flyers ($M = 8.11$, $SD = 6.80$), $t(51.91) = 2.67$, $p < .05$. This discrepancy is likely a result of our prioritization of recruitment of questionnaire study girls with higher CES-D scores.

At Time 1 (T1), participants had a mean age of 13.45 ($SD = .68$). The majority (89%) were Caucasian, and their ethnic backgrounds and household incomes were representative of their school districts. Families were contacted again one year after T1 for the second wave of data collection (T2). Eighty-eight percent participated at T2. Girls who did not participate at T2 did not differ from girls who did on co-rumination, social anxiety, or romantic experiences. However, girls who did not participate at T2 showed somewhat more depressive symptoms ($p < .05$), and thus longitudinal results may underestimate actual effects.²

Procedure

At T1, participants came to the laboratory with a parent for in-person data collection conducted over two 3 h sessions. During the first session, participants and parents provided assent/consent and participated in activities unrelated to the current study. During the second session, they completed questionnaires measuring co-rumination, depressive and anxiety symptoms, romantic experiences, and friendship quality variables. The girls and their parents were paid \$35 each for participation in the first session and \$40 each for the second session. At T2, participants used online surveys to complete, from home, a self-report depression measure plus questionnaires unrelated to the current study. The survey website was completely secure, and participants were given unique identification numbers over the phone to log on to the website. Participants and their parents were each paid \$75 for participation in T2.

Measures

Co-rumination

The Co-Rumination Questionnaire (Rose, 2002), a 27-item self-report inventory, measured the extent to which participants co-ruminated with friends. The measure covers nine content areas, with three items each: (1) frequency of problem discussion (“We spend most of our time together talking about problems that my friend or I have”), (2) tendency to talk about problems rather than doing other activities (“If one of us has a problem, we will talk about the problem rather than talking about something else or doing something else”), (3) how much the adolescent encourages her friends to discuss problems (“After my friend tells me about a problem, I always try to get my friend to talk more about it later”), (4) how much the adolescent’s friends encourage her to discuss problems (“When I have a problem, my friend always tries really hard to keep me talking about it”), (5) tendency to repeatedly revisit the same problems (“When we talk about a problem that one of us has, we will talk about every part of the problem over and over”), (6) debate about potential causes of problems (“We talk for a long time trying to figure out all the different reasons why the problem might have happened”), (7) estimating the consequences of problems (“We try to figure out every one of the bad things that might happen because of the problem”), (8) conjecture about aspects of the problem that are not understood (“We spend a lot of time trying to figure out parts of the problem that we cannot understand”), and (9) heightened focus on negative emotions (“We talk a lot about how bad the person with the problem feels”).

²Differential attrition was largely accounted for by two participants with high CES-D scores who were unable to be contacted at T2 because of extreme, adverse circumstances in their lives.

Each item was rated on a Likert-type scale, ranging from 1 (“not at all true”) to 5 (“really true”). Because all subscales were highly correlated, the mean score of all 27 items was taken to compute an overall co-rumination score (in line with the procedures of Rose, 2002). Cronbach’s alpha was .95.

Psychological symptoms

Depressive symptoms were assessed using the Center for Epidemiological Studies-Depression scale (CES-D; Radloff, 1977). The CES-D is a widely used, 20-item self-report inventory designed to assess depressive symptoms in community samples. Construct validity, internal reliability, and other psychometric strengths of the CES-D have been widely supported and replicated in adolescent samples (Radloff, 1977; Roberts, Andrews, Lewinsohn, & Hops, 1990). The mean of all 20 items was taken to compute a total score. Cronbach’s alpha was .77. Social anxiety was assessed using the Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1998). The SAS-A is an 18-item self-report questionnaire measuring the subjective experience of social anxiety, including fear of negative evaluation and social avoidance and distress when interacting with both strangers and familiar people. The mean of all 18 items was taken to compute a total score. The SAS-A has good reliability and construct validity (Inderbitzen-Nolan & Walters, 2000; La Greca & Lopez, 1998), and in the current study Cronbach’s alpha was .94.

Friendship related variables

To assess number of friends, we asked each participant to list all of her friends, and to indicate whether each person was male or female, in school with her, and whether she was close with each person. We then counted the number of friends listed in each category, yielding the numbers of male friends, female friends, close friends, friends in school, and the total number of friends. We also asked if the participant had a best friend.

Although we did not directly measure friendship quality, we assessed peer relational style, which has been strongly linked to friendship intimacy and quality (Weimer, Kerns, & Oldenburg, 2004; Zimmermann, 2004). The Behavioral Systems Questionnaire (BSQ; Furman & Wehner, 1999) is a self-report inventory measuring self-perceived relational styles in peer attachment, caregiving, and affiliation. In each domain, the BSQ assesses the level of secure, preoccupied, and dismissing styles. For each of these three relational styles, we averaged the attachment, caregiving, and affiliation scales, yielding scores representing the total degree to which participants endorsed using secure, preoccupied, and dismissing styles with friends. Cronbach’s alphas for the total scores were .83 for secure, .79 for dismissing, and .78 for preoccupied. Aspects of peer attachment were also assessed using the trust, communication, and alienation scales of the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987). Internal consistencies were .84 for trust, .84 for communication, and .69 for alienation.

We assessed self-perceived competence in peer relationships using two measures. The Interpersonal Competence Questionnaire (ICQ; Buhrmester, Furman, Wittenberg, & Reis, 1988) is a 40-item self-report inventory measuring perceptions of competence in five different areas: initiation of relationships, self-disclosure, assertion of self-interests, provision of emotional support, and ability to handle conflict. Each item is rated for both same sex friends and for either romantic partner or opposite sex friends. Total scores for both same and opposite sex were computed by averaging ratings for all items. The ICQ has shown strong validity and internal

consistency (Buhrmester et al., 1988), and has been validated using adolescent samples (Buhrmester, 1990). In our sample Cronbach's alphas were .90 and .93 for same sex and opposite sex, respectively. The Self-perception Profile for Adolescents (SPPA; Harter, 1988) measures self-perceived aptitude in several social domains. We used subscales assessing social competence. The SPPA has demonstrated good internal consistency as well as construct, convergent, divergent, and factorial validity in adolescent samples (Harter, 1988; Wichstrom, 1995). In our sample, Cronbach's alpha was .75.

Romantic experiences

We used a self-report measure to assess participants' level of romantic experience (Steinberg, Davila, & Fincham, 2006). Items described common romantic experiences that may be considered normative for early adolescents, such as having flirted with someone, having been asked on a date, and having been kissed. Each item was rated on a 4-point Likert-type scale, ranging from 1 ("never") to 4 ("many times"), and total scores were computed by taking the mean rating across all items. Internal reliability for this scale was .81.

Results

See Table 1 for descriptive statistics for depressive symptoms and social anxiety at Times 1 and 2. Mean CES-D and SAS-A scores were consistent with those found in other adolescent community samples (Inderbitzen-Nolan & Walters, 2000; Lewinsohn & Teri, 1982). Twenty-three of the 83 girls met or exceeded the commonly used cut-off score of 17 on the CES-D (Lewinsohn & Teri, 1982).

Cross-sectional associations between co-rumination and depressive symptoms

As shown in Table 2, replicating previous findings (Rose, 2002; Rose et al., 2007), greater co-rumination was significantly associated with higher CES-D symptoms.³

Associations between co-rumination and friendship-related variables

Again replicating previous findings (Rose, 2002; Rose et al., 2007), co-rumination was significantly positively associated with several variables related to friendship quality, as shown in Table 2. Participants endorsing a more secure relationship style with friends reported more co-rumination. In contrast, adolescents with dismissing friendship styles reported less co-rumination. Greater communication with friends also was associated with greater co-rumination.

Co-rumination also was associated with self-perceived competence in peer relationships, as the correlations with total same and opposite sex ICQ scores indicate. Because these

³It is possible that Co-Rumination Questionnaire items assessing focus on negative emotions tap aspects of depression. To ensure that these items did not account for the association between co-rumination and depressive symptoms, we removed these items and recomputed the correlation. The magnitude and significance remained unchanged.

Table 1
Descriptive statistics for symptom measures

	Time 1		Time 2	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
CES-D	12.77	11.71	12.87	10.93
SAS-A	43.48	16.52	40.94	16.91

Note: *N* = 82 at Time 1 and 71 at Time 2. CES-D = Center for Epidemiological Studies-Depression scale (Radloff, 1977); SAS-A = Social Anxiety Scale for Adolescents (La Greca & Lopez, 1998).

Table 2
Bivariate correlations between co-rumination, depressive symptoms, and friendship variables

	1	2	3	4	5	6	7	8	9	10	11	12	<i>M</i>	<i>SD</i>
1. Co-Rumination	–												2.94	.74
2. T1 CES-D	.25*	–											12.77	11.71
3. ICQ-Same Sex	.42**	–.28*	–										3.78	.55
4. ICQ-Opposite Sex	.50**	–.12	.82**	–									3.48	.60
5. BSQ-F Secure	.40**	–.18	.52**	.44**	–								3.83	.47
6. BSQ-F Preoccupied	.08	.51**	–.47**	–.28*	–.26*	–							2.21	.50
7. BSQ-F Dismissing	–.21*	.18	–.60**	–.44**	–.55**	.39**	–						2.01	.46
8. IPPA-Communication	.38**	–.11	.41**	.37**	.77**	–.24*	–.41**	–					32.72	5.40
9. IPPA-Trust	.12	–.35**	.41**	.32**	.69**	–.43**	–.41**	.77**	–				41.49	5.53
10. IPPA-Alienation	.08	.53**	–.49**	–.24*	–.38**	.53**	.35**	–.38**	–.54**	–			13.76	4.59
11. SPPA-Social Competence	.22*	–.22	.44**	.31**	.36**	–.06	–.37**	.25*	.35**	–.34**	–		3.32	.62
12. T2 CES-D	.16	.36**	–.15	.09	–.18	.16	.09	–.02	–.13	.45**	–.06	–	12.87	10.93

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

Notes: *N* ranges from 76 to 83. Co-Rumination Questionnaire (Rose, 2002); CES-D = Center for Epidemiological Studies-Depression scale (Radloff, 1977); ICQ = Interpersonal Competence Questionnaire (Buhrmester, Furman, Wittenberg, & Reis, 1988); BSQ-F = Secure, Preoccupied, and Dismissing scales of Behavioral Systems Questionnaire-Friend (Furman & Wehner, 1999); IPPA = Inventory for Parent and Peer Attachment (Armsden & Greenberg, 1987); SPPA = Self-Perception Profile for Adolescents (Harter, 1988). Portions of these results are also presented elsewhere (Starr & Davila, in press).

scores included items from the self-disclosure scale, which has substantial conceptual overlap with co-rumination, we removed these items from the total scale scores and redid the analyses to ensure that the positive associations were not remnants of the shared features of the two measures. After removing the self-disclosure items, both same sex and opposite sex ICQ scores remained significant ($r_s = .38$ and $.47$ respectively; $p_s < .001$). The SPPA social competence subscale was also significantly positively correlated with co-rumination.

A higher number of male friends were related to greater co-rumination ($r = .34$, $p = .002$). Co-rumination was not related to number of close friends or number of female friends, although the relationship with having a best friend neared significance ($r = .22$, $p < .07$).

Association between co-rumination and social anxiety

The zero-order correlation between self-reported social anxiety and co-rumination was not significant ($r = .02$, ns). Because depressive symptoms were associated with co-rumination and because there was significant covariance between depressive symptoms and social anxiety ($r = .59$, $p < .001$), we computed the partial correlation between social anxiety and co-rumination, controlling for depressive symptoms. In this case, social anxiety was negatively related to co-rumination, so that girls with more social anxiety co-ruminated less ($pr = -.22$, $p < .05$). We also re-examined the relationship between depressive symptoms and co-rumination, controlling for social anxiety, and found that the magnitude increased ($pr = .33$, $p = .003$).

Longitudinal association between co-rumination and depressive symptoms

To examine whether co-rumination predicted changes in depressive symptoms, we computed partial correlations between T1 co-rumination and T2 depressive symptoms, controlling for T1 depressive symptoms. Co-rumination was not associated with changes in CES-D symptoms, $pr = .08$, ns.

Association between romantic experiences, co-rumination, and depressive symptoms

More romantic experience was associated with higher levels of co-rumination ($r = .34$, $p = .002$). As reported elsewhere using data from this sample (Steinberg & Davila, *in press*), girls with more romantic experiences also reported more depressive symptoms ($r = .33$, $p = .003$).

Mediation and moderation analyses

We intended to test whether co-rumination mediated the association between romantic experiences and increases in depressive symptoms over time by following steps suggested by Baron and Kenny (1986). However, because co-rumination did not predict T2 symptoms, failing to meet one of Baron and Kenny's conditions, we did not conduct these analyses.

We ran moderator analyses to examine whether romantic experiences interacted with co-rumination to predict changes in depressive symptoms. We conducted a hierarchical regression analysis predicting T2 depressive symptoms. As predictors, we first entered T1 CES-D, next entered co-rumination and romantic experiences (both centered), and last entered the product of centered co-rumination and romantic experiences. The interaction was significant ($B = .15$, $Beta = .23$, $t(70) = 2.03$, $p < .05$). We conducted simple slope tests to decompose the interaction (Aiken & West, 1991). For girls high on romantic experiences (defined as one standard deviation above the mean), co-rumination was associated with increases in depressive symptoms ($B = .14$, $Beta = .25$, $t(70) = 1.48$, $p = .14$). However, for girls low on romantic experiences (one SD below the mean), co-rumination was associated with *decreases* in depressive symptoms ($B = -.09$, $Beta = -.17$, $t(70) = -1.22$, $p = .23$). Although these betas are weak and non-significant, the significance of the interaction shows that the relationship between co-rumination and changes in depressive symptoms varies depending on the level of romantic experiences. See Fig. 1 for an illustration of this interaction. Because it is also conceptually interesting to interpret this

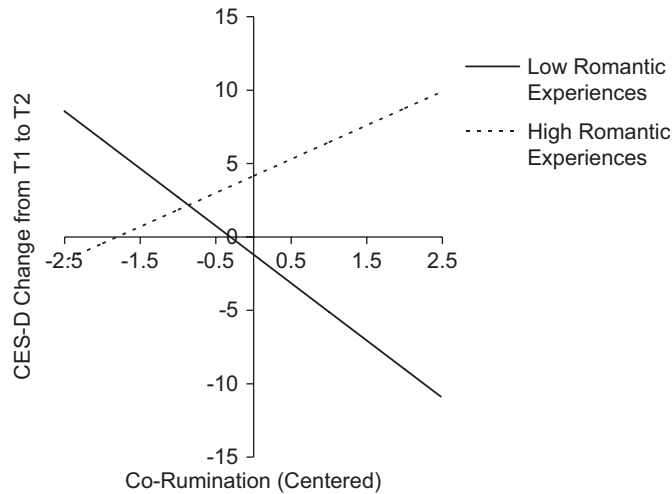


Fig. 1. Interaction between romantic experiences and co-rumination in predicting depression. *Notes:* Lines represent regression equations. High romantic experiences = one SD above the mean; low romantic experiences = one SD below the mean. Co-rumination scores are centered (mean = 0). CES-D change scores were computed by subtracting T1 CES-D scores from T2 CES-D scores.

interaction in terms of how co-rumination affects the relation between romantic experiences and changes in depressive symptoms, we conducted a set of supplementary simple slope tests. For girls high on co-rumination (one SD above the mean), romantic experiences predicted increases in depressive symptoms ($Beta = .57$, $t(70) = 3.38$, $p = .001$). In contrast, for girls low on co-rumination (one SD below the mean), romantic experiences did not predict changes in depressive symptoms ($Beta = .15$, $t(70) = 1.03$, $p = .31$).

Supplemental analyses

To add convergent evidence to co-rumination's link to romantic involvement, we examined whether co-rumination was associated with perceptions of having learned about romantic relationships from friends rather than parents. Adolescents who learn about romantic relationships from their friends rather than their parents are at heightened risk for early sexual activity and other risky activities (Steinberg, Davila, & Fincham, 2005). Participants were asked how much they think they have learned about romantic relationships from various sources including friends (two items: "Watching how your friends behave with romantic partners," and "Talking to your friends about romantic relations"), and parents (two items, worded similarly to friend items; see Steinberg et al., 2005, for more scale information). Item scores were summed to produce composite friend ($\alpha = .77$) and parent ($\alpha = .65$) scores. As predicted, co-rumination was significantly related to reports of learning about relationships from friends ($r = .39$, $p < .001$), but was not associated with learning about relationships from parents ($r = -.01$, ns).

As an additional supplemental analysis, we attempted to replicate Rose et al.'s (2007) finding that co-rumination significantly predicts changes in friendship-related variables. Although not a primary focus of this paper, the idea that co-rumination has a positive impact on friendship is an

important component of Rose's (2002) theory. In addition, as self-disclosure has been shown to be an important mechanism of relationship development and identity formation (Altman & Taylor, 1973; Sullivan, 1953), it is important to determine whether co-rumination has the same social consequences. We tested all friendship-related variables for which data were collected (i.e., same and opposite sex ICQ, BSQ-friend secure, preoccupied, and dismissing scales, IPPA communication, trust, alienation, SPPA social competence, and number of close, female, and male friends, and having a best friend). Of these, T1 co-rumination significantly predicted changes in two. First, T1 co-rumination predicted decreases in opposite sex ICQ at T2 (controlling for T1 opposite sex ICQ; $pr = -.33$, $p < .01$). Second, T1 co-rumination predicted lower number of female friends at T2 (controlling for T1 number of female friends, $pr = -.26$, $p < .05$). T1 co-rumination did not predict changes in any other friendship-related variables.

Discussion

This study replicated previous findings on co-rumination and extended earlier work by examining further correlates and longitudinal patterns. Replicating previous findings (Rose, 2002; Rose et al., 2007), we found that co-rumination is cross-sectionally positively related to: (1) depressive symptoms and (2) positive aspects of friendship, including friendship security and communication. We further showed that girls who co-ruminate more see themselves as more interpersonally competent, in both same and opposite sex relationships. The replication of Rose's results is important, especially as the implication that some aspects of close friendship may be maladaptive in adolescence is somewhat counterintuitive.

In addition, we attempted to replicate Rose et al.'s (2007) findings by examining co-rumination's longitudinal associations with depressive symptoms. Importantly, co-rumination, on average, did not predict increases (or decreases) in depressive symptoms. This fails to support the notion that co-rumination, on its own, is a maladaptive, depressogenic coping mechanism, as well as the idea that co-rumination is an adaptive form of support seeking. Our results seemingly contradict those of Rose et al. (2007), who found that co-rumination predicted increases in depressive symptoms. Note, however, that our effect sizes, though non-significant, were nearly identical to those of Rose et al. Thus, co-rumination may predict small changes in depressive symptoms that emerge as significant in large samples, yet it is not clear whether these changes will translate into clinically significant change. Although little research has been conducted on co-rumination, several researchers have speculated that it may account for negative outcomes, such as peer contagion of depressive symptoms (Stevens & Prinstein, 2005). However, it remains to be seen whether this is the case, particularly for minor symptom increases. As this study is only the second to prospectively examine co-rumination, far more research is needed before any conclusions are drawn about the depressogenic nature of co-rumination.

We also examined several previously unaddressed questions, with findings extending prior research in important new directions. First, although Rose assessed broadly defined anxiety, we showed that one type of anxiety—social anxiety—correlated negatively with co-rumination (when controlling for depressive symptoms), displaying the opposite pattern as depression. This finding is not surprising, as people with social anxiety are less likely to self-disclose (Alden &

Taylor, 2004) and generally have fewer close friends and thus fewer opportunities to co-ruminate (La Greca & Lopez, 1998). The differential relationship of social anxiety and depressive symptoms with co-rumination underscores the importance of separately examining interpersonal components of different types of internalizing symptoms. Whereas including anxiety and depression together in one internalizing category may be appropriate for younger children, these results add to growing evidence that by adolescence depression and social anxiety are differentiated enough to evidence distinct interpersonal patterns (Starr & Davila, *in press*). Further, these findings demonstrate the importance of controlling for comorbid symptoms when examining interpersonal correlates of depression and anxiety.

Second, we extended previous research by focusing on an additional, important aspect of peer functioning, demonstrating that co-rumination was associated with higher levels of romantic experiences. Early adolescent girls with more romantic involvement may have more problems to co-ruminate about compared to girls with minimal romantic experiences. While we know nothing about the types of problems that co-ruminating girls tend to discuss, these results may imply that co-rumination often centers around romantic difficulties or desires, fitting with research showing that peers play an important role in early romantic processes (Brown, 1999; Connolly & Goldberg, 1999). This idea draws further support from our finding that co-rumination is linked to a greater tendency to turn to friends to learn about romantic relationships. Interestingly, co-rumination was also associated with reporting a higher number of male friends, implying that heterosocial involvement of any kind, not just romantic, may lead to co-rumination. Alternatively, there may be individual characteristics associated with co-rumination (e.g., sociability) that are also associated with a tendency to seek out romantic relationships.

In addition to correlating with co-rumination, romantic involvement moderated co-rumination's impact on depressive symptoms. Co-rumination predicted *increases* in depressive symptoms for girls with greater romantic experiences and *decreases* for girls with fewer (although these effects were relatively small). This demonstrates that although co-rumination may not be deleterious for all girls, it may have negative effects for those engaging in romantic activities. The association between romantic experiences and depression in early adolescence (Davila et al., 2004; Joyner & Udry, 2000) may imply that girls at this age are not always equipped to manage the challenges of romantic involvement, and that attempting to do so can be stressful. Perhaps co-rumination is only depressogenic if it coincides with a stressful experience. Rumination predicts the onset of depression following a naturalistic stressor (e.g., earthquake, loss of spouse, etc.; Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema et al., 1994). Similarly, as implied above, if the problems adolescents discuss are stressful, perseverating on them through co-rumination may be especially upsetting, and failing to engage in active problem solving may allow problems to escalate and become more stressful, potentially leading to depressive symptoms. In contrast, co-ruminating about problems with low levels of associated stress or little potential for negative consequences may be less likely to result in dysphoria. Future research should clarify whether stressors in other domains (e.g., family, school) also moderate the relation between co-rumination and depressive symptoms. This would clarify whether there is something specific about romantic experiences, or if intense emotional experiences in general (i.e., in any domain) account for this effect. Further research should examine whether the type of emotions experienced in adolescent romance affects the relation between co-rumination and depressive symptoms.

Another way to consider this interaction is that romantic experiences only predicted increases in depressive symptoms for high co-ruminators. Co-rumination may constitute an important piece to the puzzle of why early romantic experiences are linked to depression. Romantic experiences may be most depressogenic when girls talk about them with friends in a ruminative manner. In addition, [Steinberg and Davila \(in press\)](#) showed that maternal emotional availability moderated the role between romantic involvement and depressive symptoms in early adolescents. Perhaps girls whose mothers are unable to offer emotional support and guidance for their romantic difficulties instead turn to their friends, whose advice may not be as informed or helpful. In any case, these findings underscore the importance of considering peer processes when researching the depression–romantic experiences link. Interestingly, this study's findings support [Sullivan's \(1953\)](#) prediction that youth with more supportive and self-disclosing friendships are more likely to be romantically involved, while countering Sullivan's assumption that support (at least in the form of co-rumination) is necessarily adaptive.

Future research should continue to examine conditions under which co-rumination increases risk for depression. For example, the degree to which co-rumination represents a maladaptive coping mechanism may depend on skills of the individuals (and their friends). Co-rumination may lead to depressive symptoms if it interferes with effective problem solving (as with rumination; [Lyubomirsky & Nolen-Hoeksema, 1995](#); [Lyubomirsky, Tucker, Caldwell, & Berg, 1999](#)). In contrast, if adolescents and their friends have strong problem-solving skills, repetitive focus on problems may allow them to generate solutions. Further research should examine whether co-rumination is more adaptive for dyads with better collective problem-solving skills.

Second, co-rumination may be more depressogenic among adolescents with higher levels of pre-existing depressive symptoms. [Nolen-Hoeksema \(1991\)](#) conceptualizes rumination (considered to be analogous to co-rumination) as a style of responding to existing depressive symptoms. Experimental evidence shows while rumination boosts depressive symptoms in dysphoric individuals, it produces no change in mood among non-dysphoric participants ([Nolen-Hoeksema, 1991](#)). Co-rumination may operate in a similar manner, aggravating depressive symptoms in dysphoric adolescents but not predisposing non-dysphoric youth to the development of symptoms. In this community sample, the majority of participants were not significantly depressed, perhaps explaining why co-rumination did not, on average, predict increases in depressive symptoms at T2. Future research should examine whether co-rumination is more depressogenic in clinical samples.

Although co-rumination is theoretically analogous to rumination, it is also important to recognize how these constructs differ. First, whereas rumination focuses on one's own negative affect ([Nolen-Hoeksema et al., 1994](#)), co-rumination, as defined by [Rose \(2002\)](#), focuses on problems. This discrepancy in definition may help explain why according to our results co-rumination, unlike rumination, does not on average predict increases in depressive symptoms, as rumination's explicit tie to depressive symptoms may be a key component of its depressogenic nature. Further, rumination is a private experience, whereas co-rumination is a public form of self-disclosure. As self-disclosure benefits mental health ([Pennebaker, 1997](#)), co-rumination may have protective components that counteract its potentially depressogenic aspects.

This study failed to replicate [Rose et al.'s \(2007\)](#) finding that co-rumination predicted increases in positive aspects of peer relations. In fact for two variables—opposite sex interpersonal competence and number of female friends—co-rumination predicted prospective *decreases*,

suggesting that co-rumination may deteriorate certain aspects of peer functioning. As our follow-up period was longer than that of Rose et al.'s (2007), it may be that these effects take a longer time to emerge. Co-rumination may have short-term benefits for friendship, but may put strain on friendship networks over time, causing same-sex friendships to be dissolved. This suggests that, although self-disclosure is largely viewed as beneficial to the development of intimacy and friendship (McNelles & Connolly, 1999), certain types of self-disclosure may be deleterious. In addition, co-rumination about heterosocial relationships may artificially inflate self-perceived competence, which may then deflate following negative experiences over time. This explanation is purely speculative, and should be examined empirically.

A few limitations to this study merit note. First, our sample was recruited from the community and accordingly most participants were not clinically depressed. As previously discussed, an important next step is to examine co-rumination in clinical samples. Second, our sample was all female. On the one hand, this may be a strength, because girls are more likely to both co-ruminate and become depressed. However, it also precludes examination of gender differences. Girls' higher tendency to co-ruminate may help explain their greater vulnerability to depressive symptoms. Rose (2002) found that controlling for co-rumination fully eliminated gender differences in depression, although it is important to replicate these results using an older sample, as Rose's sample included preadolescents, younger than the age when gender differences emerge (Hankin & Abramson, 2001). Finally, we relied on individual self-reports of co-rumination, which may or may not reflect actual behavior. As co-rumination is fundamentally a dyadic process, it may be important to also collect data from friends, especially as friend characteristics may influence the impact of co-rumination on depressive symptoms.

Despite these limitations, this study broadens our understanding of co-rumination, although more research is needed. Experimental research, in which co-rumination is induced in the laboratory, would help reveal whether co-rumination is truly depressogenic (and under what circumstances). A number of studies have induced rumination in the laboratory, usually by instructing participants to concentrate on emotion-focused, self-focused, and symptom-focused cognitions (e.g., Lyubomirsky & Nolen-Hoeksema, 1993). A similar procedure might be applied to co-rumination, by instructing dyads to converse with a repetitive focus on negative aspects of problems. Alternatively, researchers could enlist confederates to co-ruminate with participants. Research should also clarify the extent to which co-rumination is actually analogous to cognitive rumination by exploring whether co-rumination follows similar patterns and mechanisms as those identified in the literature on rumination. For example, research should explore whether co-rumination, like rumination, negatively affects problem-solving and autobiographical memory retrieval (Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998; Lyubomirsky et al., 1999). It may also be useful to develop observational coding systems to assess co-rumination in dyads. This may both provide convergent validity to Rose's (2002) co-rumination measure and allow for examination of the content and form of co-rumination in naturalistic settings. Future investigators should also further examine how co-rumination impacts friendship networks to determine whether it may strain or strengthen relationships and the conditions under which it may do so. Finally, research should determine whether co-rumination occurs across different age groups and relationship types (e.g., married couples), or if it is uniquely associated with child and adolescent friendships. There are many more interesting avenues for future research, and we hope that more investigators will embark on studying this exciting but neglected construct.

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