CHEWING THE CUD, AND CHEWING IT DIFFERENTLY:
CONTEXTUAL AND INDIVIDUAL DIFFERENCES IN REACTIVE RUMINATION
AND NEGATIVE AFFECT

by

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Abstract

The present study explores the relationships between reactive ruminative style, daily reactive rumination, and daily negative affect, both within the same day, and across days. Further, the extent to which perceived social support moderates the effect of a reactive ruminative style on daily reactive rumination was explored. One hundred and seventy-six individuals were interviewed and completed a structured diary twice daily for one week. The results of hierarchical linear modeling suggested that reactive ruminative style and daily reactive rumination interacted to predict fluctuations of daily negative affect within the same day. Next day fluctuations in negative affect were predicted by a reactive ruminative style. Furthermore, results indicated that perceived social support interacted with a reactive ruminative style to predict both same day and next day daily reactive rumination. Relevance to both reactive rumination theory and the stress and coping literatures are discussed.
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Chewing the cud, and chewing it differently:

Contextual and individual differences in reactive rumination and negative affect

Reactive rumination, a person's tendency to cope with stressors, negative mood, and the self by perseverating on related content, has been found to be associated with various indices of psychological well-being (Nolen-Hoeksema, 2004; Spasojević, Alloy, Abramson, MacCoon, & Robinson, 2004; Trapnell & Campbell, 1999). The majority of studies has primarily considered rumination to be a consistent response style to stressors or dysphoric mood, and has thus focused on nomothetic, or between-person, differences. However, recent conceptualizations of the stress and coping process propose an integrative framework (Lazarus, 1993; Moos & Holahan, 2003), wherein the coping process is considered to encompass both stable personality factors and more transient situational factors. Daily process methodologies allow for the examination of these transient situational factors, by looking at within-person, idiographic processes across time and between-persons differences in the coping process (Tennen, Affleck, Armeli, & Carney, 2000).

The purpose of the present study is to examine the importance of both a reactive ruminative style and daily ruminative responses to stressors in predicting same and next day emotional functioning. Further, perceived social support has been suggested as a moderator of a ruminative style's impact on negative affect. We investigated whether perceived social support impacts the extent to which individuals ruminate within and across days. Employing a time-intensive design minimizes recall error and further allows a close examination of the temporal patterning of stress, coping, and support processes (DeLongis, Hemphill, & Lehman, 1992).
Rumination Defined

The concept of rumination extends out of the work on dysphoric rumination (Lyubomirsky & Tkach, 2004; Nolen-Hoeksema, 1991, 2004), reactive rumination (Spasojević & Alloy, 2003; Spasojević et al., 2004), private self-consciousness theory (Trapnell & Campbell, 1999), and self-focused attention theory (Carver, 1996; Carver & Scheier, 1990). Depending on the theoretical orientation of the researchers, rumination has been considered either an adaptive or a maladaptive style by which people generally respond to a negative mood or life stressor. In general, Carver (1996) describes rumination that leads to problem-focused coping as adaptive and rumination associated with emotion-focused coping as maladaptive (see also Carver & Scheier, 1990). In the same vain, Martin and Tesser (1996) lay out positive and negative modes of rumination in response to past, present and future goal discrepancies and attainments (see also Martin, Shrira, & Startup, 2004).

On the other hand, a number of theorists conceive of rumination as a completely maladaptive response. For example, Nolen-Hoeksema’s (1991, 2004) Ruminative Response Style theory views rumination in response to a dysphoric or depressive episode, which they label dysphoric rumination, as being a maladaptive style of coping that significantly increases the number, length and severity of such episodes. In Ruminative Response Style theory, rumination is defined as a form of coping that involves “repetitive and passive thinking about one’s symptoms of depression and the possible causes and consequences of these symptoms” (2004, p. 107; Nolen-Hoeksema, Parker, & Larson, 1994).
Recently, Spasojević and her colleagues (2004) defined a similar maladaptive process termed reactive rumination. Reactive rumination is conceived as a self-regulatory process by which a person perseverates on content that is not limited to depressive symptomatology (as in Nolen-Hoeksema’s theory) without satisfactory resolution. Finally, Trapnell and Campbell (1999) defined rumination as a self-attention process motivated by perceived threats, losses, or injustices to the self.

In the present study, we conceptualize rumination as a coping strategy. Ruminative coping involves perseverating on content that is not limited solely to depressive symptoms but extends into ruminating about present and past experiences, and about thoughts regarding the self. Further, we employ the term reactive rumination, since our conceptualization is most similar to Spasojević and colleagues (2004; see also Robinson & Alloy, 2003). Reactive rumination is a unique process different from dysphoric rumination, in that it includes ruminating about stressors and the self, not only about depressive symptomatology.

Research supports the purported dispositional nature of rumination (Lyubomirsky & Nolen-Hoeksema, 1993; Pyszczynski & Greenberg, 1987; Just & Alloy, 1997). Nolen-Hoeksema, Morrow, and Frederickson (1993) measured the mood and responses to mood of a sample of college students for a 30-day period. Eighty-three percent of their sample consistently responded to their dysphoric moods, supporting the proposition that rumination is a characteristic tendency. Other studies have demonstrated that rumination is a stable response style at a 5-month interval (Nolen-Hoeksema et al, 1994 & Larson, 1994), and one-year interval (Just & Alloy, 1997; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Roberts, Gilboa and Gotlib (1998) demonstrated that a dysphoric
ruminative style persists beyond dysphoric episodes, demonstrating a trait-like tendency that exists beyond a depressive episode.

*Rumination, Depressive Symptomatology and Negative Affect*

In fact, many studies have proposed associations between depressive symptomatology and ruminative styles (Just & Alloy, 1997; Nolen-Hoeksema, McBride, & Larson, 1997; Spasojević & Alloy, 2001). A series of experimental and prospective studies have found that ruminating about depressive symptoms prolongs and intensifies a dysphoric episode in non-clinical samples (Just & Alloy, 1997; Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema, 1991), earthquake survivors (Nolen-Hoeksema & Morrow, 1991) and the bereaved (Bodnar & Kiecolt-Glaser, 1994; Nolen-Hoeksema & Davis, 1999; Nolen-Hoeksema et al., 1994). Importantly, Robinson and Alloy (2003) suggest that a tendency to ruminate in response to life stressors, Reactive Ruminative Style (RRS), and not specifically to depressive symptomatology, moderates onset, duration and number of major depressive episodes. They suggested that RRS, in combination with a depressogenic cognitive style, better and more consistently predicts depressive episodes, and their duration, than does having a dysphoric ruminative style.

Most evidence points to an association between chronic depressogenic self-focusing and different qualities of depressive symptomatology, such as vulnerability, maintenance and severity in nonclinical and clinical samples (Ingram, 1990; Ingram, Lumry, Cruet, & Sieber, 1987; Just & Alloy, 1997; Nolen-Hoeksema et al., 1993; Smith & Greenberg, 1981; Spasojević & Alloy, 2001). The tendency to ruminate has also been associated with other affective states, such as anger (Hogan & Linden, 2004; Linden et al., 2003; Rusting & Nolen-Hoeksema, 1998) and anxiety (Nezlek, 2002; Woody, 1996).
Taken together, these findings suggest that the tendency to ruminate leads to a heightening and maintenance of negative mood in general, as opposed to depressive mood in particular.

*Daily Negative Affect and Rumination*

Research has established that minor, everyday stressors impact well-being as well (Almeida, Wethington, & Kessler, 2002; Bolger, DeLongis, Kessler, & Schilling, 1989; DeLongis, Folkman, & Lazarus, 1988; Lavallee & Campbell, 1995; Marco, Neale, Schwartz, Shiffman & Stone, 1999). Negative affect and stressors have been found to covary on same-day recordings, whereas, stressors have not been found to be related to negative affect on subsequent days (DeLongis, Capreol, Holtzman, O’Brien, & Campbell, 2004; DeLongis, Folkman, & Lazarus, 1988); Stadler & Hokanson, 1998; Taylor, 1991).

A transactional stress model (Lazarus, 1993; Lazarus & DeLongis, 1983) suggests that coping processes mediate the impact of stressors on psychological well-being. Coping in response to stressors has been established as an important predictor of psychological well-being (Bolger & Zuckerman, 1995; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Folkman, Lazarus, Gruen, & DeLongis, 1986; Lazarus & Folkman, 1984). More importantly, the methods by which a person copes with stress have been found to be more strongly associated with well-being than is mere exposure to stressors (Bolger & Schilling, 1991; Bolger & Zuckerman, 1995). Few studies to date have evaluated coping via reactive rumination in response to daily stressors, which we term daily reactive rumination (DRR), and its association with negative mood in daily life (Lavallee & Campbell, 1995; Nolen-Hoeksema et al., 1993; Wood et al., 1990).
Wood and her colleagues (1990) designed an idiographic/nomothetic study looking at male participants’ day-to-day variations in negative affect (i.e. sad, clutched-up, angry, skeptical) and their relation to day-to-day changes in rumination in response to the most troublesome daily event. In their study, those who ruminated in response to a stressor over a 30 day period were also characteristically higher in negative affect. In addition, on a within-person level, rumination in response to a stressor was associated with more intense negative affect on the same day. Subsequent day associations between negative affect and previous day DRR were not studied.

Similar findings were demonstrated by Lavallee and Campbell (1995). Sixty-three men and women participated in a two-week, twice daily, prospective diary study. Results indicated that in response to goal-relevant negative events, greater negative affect and greater reactive rumination covaried at the individual level. They also demonstrated that, on average, those individuals who ruminated more during the study in response to stressors were also more likely to experience negative affect. However, neither Wood and her colleagues (1990) nor Trapnell and Campbell (1995) measured participants’ disposition to ruminate in response to a stressor prior to the daily recording of reactive rumination. Therefore, the relationship between a reactive ruminative style and daily reactive rumination remains unclear.

Wood and her colleagues (1990) concluded that most individuals ruminate when they are distressed, but that some individuals are able to exit the repetitive thinking cycle while others cannot and, therefore, remain distressed. In an experimental study, those high in trait-rumination have been found to generate more reasons for a negative affect episode than those low in trait rumination. These results hold even when participants low
in trait rumination were instructed to produce as many reasons as possible for their affect (Watkins & Mason, 2002). It seems likely that since those higher in RRS remain in the cycle longer generating more reasons for their moods and stressors, that they would experience more severe fluctuations of negative affect on a daily basis as compared to those lower in RRS who also engage in DRR.

Perceived Social Support and Daily Reactive Rumination

RRS has been evidenced to impact not only psychological well-being, but additionally to predict social outcomes. These include interpersonal tension, decreases in social support and social isolation. Relations of RRS to social well-being hold even after controlling for number of past depressive episodes, initial depressive symptomatology and cognitive risk status (Bodnar & Kiecolt-Glaser, 1994; Spasojević & Alloy, 2003; Spasojević et al., 2004). The risk to high RRS individuals for negative social outcomes may possibly be attenuated for those with increases in perceived social support. Findings suggest that functional social resources, such as perceived social support (Cohen & Wills, 1985; Turner, 1983, 1999), are associated with adaptive, approach coping responses to stressors (Holahan and Moos, 1987; Holahan, Moos, Holahan, & Brennan, 1997). A lack of support has been associated with maladaptive coping strategies (Holahan & Moos, 1987, 1991; House, Umberson, & Landis, 1988; Manne & Zautra, 1989; Moos, Brennan, Fondacaro, & Moos, 1990; Thoits, 1995). Additionally, perceived social support from family and friends has been found to buffer the relationship between stressors and well-being on a daily basis (DeLongis et al., 1988).

To date, few studies have identified the relationship between perceived social support and rumination. Social support has been demonstrated to moderate the
relationship between bereavement and depressive symptomatology (Nolen-Hoeksema et al., 1994; Nolen-Hoeksema & Davis, 1999; Pennebaker & O’Heeron, 1984). Nolen-Hoeksema and Davis (1999) reported that individuals coping with loss who were socially isolated were more likely to report concurrently engaging in dysphoric rumination than people who felt socially connected. Further, those who reported feeling socially affirmed experienced less concurrent dysphoric rumination than less socially affirmed individuals. Importantly, individuals both high in trait-rumination and who received emotional support were less depressed up to 18 months following loss than were those high in trait-rumination but with low emotional support. For individuals low in trait-rumination, received emotional support had no significant effect on depressive symptomatology. In addition, social isolation had a weak negative impact on depressive symptomatology in individuals low in trait-rumination. Feeling socially connected and emotionally supported is thus postulated to help those high in trait-rumination to cope more actively and effectively (Nolen-Hoeksema & Davis, 1999). We expected then that perceived social support would buffer the effects of a reactive rumination style on daily negative affect by decreasing the extent individuals high in RRS engage in DRR in response to stressors. However, perceived social support was expected to have little moderating effect on DRR for low RRS individuals, as they were expected to engage less in DRR on a daily basis in theory (Nolen-Hoeksema, 2004; Robinson & Alloy, 2003).

**Current Study**

The primary aim of the current study was to investigate reactive ruminative style, daily reactive rumination in response to a stressor, and daily negative affect. Strong evidence supports the consistency of a reactive ruminative style (Just & Alloy, 1997;
Treynor et al., 2003), and has possibly contributed to the dearth of studies investigating intra-individual differences in reactive rumination and its association with negative affect.

The current study used multi-level modeling (Tennen et al., 2000), which allowed for the simultaneous examination of both between-person differences in RRS and within-person differences in DRR and negative affect. Moreover, the relationship between DRR and negative affect was investigated as it unfolded over time, allowing for the examination of both immediate and lagged effects on negative affect.

It was expected that, within the course of a day, DRR would be associated with greater daily fluctuations in negative affect. We further predicted individuals with a greater RRS to have more severe negative affect both within and across days. More importantly, we expected, based on previous research (Watkins & Mason, 2002; Wood et al., 1990) that, compared with participants lower in RRS, those higher in RRS who reported engaging in higher levels of DRR would experience greater increases in same day evening negative affect. We further expected that, based on previous research (DeLongis et al., 2004; Stadler & Hokanson, 1998; Taylor, 1991), every day is a new day, and thus previous day DRR would not predict next day negative affect.

In addition, we expected that, for those higher in RRS, perceived social support would moderate the extent to which DRR is reported in response to a stressor. Specifically, those higher in RRS who reported lower perceived social support were expected to report higher levels of DRR, as compared to those higher in RRS who reported higher perceived social support levels. As those lower in RRS were expected to report generally lower levels of DRR, we did not anticipate an effect of perceived social support on DRR among those lower in RRS.
Method

Data for the current study were drawn from information collected as part of a larger prospective study that investigated stress, coping, and support within couples living in stepfamilies. The design included two interviews conducted approximately two years apart. It also included a battery of questionnaires and structured daily diaries that were completed after the first interview. Only those procedures and measures that are pertinent to the present study will be discussed here.

Sample

Couples were recruited from the Lower Mainland of British Columbia via newspaper and radio advertisements, notices in school newsletters, posters on community bulletin boards, and solicitation at several local stepfamily groups. The participant pool was limited to those families having at least one child from a previous union (from either spouse) living in the home for more than three months of the year. Additionally, only participants who were married or living common-law were included in the prospective study (participants living common-law are henceforth referred to as married in the present investigation). Participants were further limited to those who were fluent in English. For the current study, only those couples for whom both the husband and wife completed the first and second interviews, self-report measures, and structured daily diaries were included in the analyses ($N = 176$). The only significant difference between couples who chose to complete the daily structured diaries and those who did not was the average age of the children.

The mean age of the sample was 40 years, ranging in age from 20 to 59 years. The majority of participants were Canadian-born (72%), with the remainder largely from
other English-speaking countries such as Great Britain and the United States. The mean level of education was 13 years, ranging from 5 to 17 years. Participants were predominantly middle to upper-middle class and the majority was employed (80%).

Couples had spent an average of 4.6 years living together in the current union, with a range from less than a year to 12 years. The majority of the husbands and wives in our sample had been married at least once previously. Eighty-eight percent of the sample had children from a previous union. The mean number of children in the stepfamily was 3.1, with a range from one to eight children.

Procedure

During the first phase of the study, telephone interviews were conducted by trained undergraduate research assistants. In-depth telephone interviews were scheduled separately with each spouse. Each spouse was assigned to a different female interviewer and each interviewer was blind to any information received from the other spouse. Open-ended questions included in the initial interview were tape-recorded with permission from the participant to allow for verbatim transcription. The tapes also provided assurance the interviewers were following standardized protocol.

Following the first interview, participants were mailed a packet of self-report measures and a set of structured diaries to be completed twice per day over a period of one week. For the present study, data from both daily sampling events were used. Participants were asked to complete the diary entries “around lunchtime or mid afternoon” and “just before going to sleep at night.” Participants recorded the time of each entry of their diary. Participants returned the diaries and self-report measures in stamped envelopes provided. In the instructions accompanying the self-report measures
and diaries, the importance for each spouse to independently complete the packets was emphasized. Each spouse was further instructed to seal each diary entry after completion with adhesive tabs provided. It was expected that these instructions would increase independent completion and confidentiality.

**Interview Measures**

Both the initial and follow-up interviews included a number of measures assessing the relationships within the individual's family, common difficulties arising within the stepfamilies, and demographics.

**Demographics.** Various participant and family demographics were assessed during the interview. Age, gender, and socio-economic status (SES) were assessed as necessary control variables for the study.

**Self-report Measures**

**Reactive ruminative style.** The Rumination-Reflection Questionnaire (RRQ; Trapnell & Campbell, 1999) was included in the take-home packet as a measure of participants' tendencies to direct attention toward one's feelings and thoughts. The rumination factor of the RRQ was developed to measure a person's tendency to attend to perceived threats, losses and injustices to the self (labeled neurotic self-consciousness). An initial version of the measure was completed by 129 participants and analyzed. In brief, three rumination items were dropped from the initial RRQ and two rumination items were reworded to create the final version of the RRQ (Trapnell & Campbell, 1999, study 3). The present study ran alongside the development of the RRQ and thus, the initial RRQ was employed in 27.3% of the cases in the present study. The majority of the
participants received the final version. There were no significant differences in the means of the rumination and reflection subscales for the two slightly different versions of the RRQ, $t(94) = .335, p > .50$ and $t(94) = -.02, p > .50$. Responses to each item are given on a 5-point Likert scale with the points strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5).

The rumination subscale of the RRQ is a 12 item scale. Items include, “often I’m playing back over in my mind how I acted in a past situation”, “long after an argument or disagreement is over with, my thoughts keep going back to what happened”, and “I tend to ruminate or dwell over things that happen to me for a really long time afterward.” Cronbach alpha for the subscale in our study showed high internal consistency ($\alpha = .93$), which is similar to previously reported cronbach alpha ($\alpha = .91$; Trapnell & Campbell, 1999, study 3). Higher scores on the rumination subscale reflect a stronger tendency to have RRS.

**Perceived social support.** The Provisions of Social Relations (PSR, Turner, Frankel, & Levin, 1983) was included in the take home packet to be completed individually by the participants. The PSR is a 15 item questionnaire developed to measure five components of perceived social support (attachment, social integration, reassurance of worth, reliable alliance, and guidance) in both community and clinical samples. There are two dimensions to the PSR: family and friend social support. The perceived family social support dimension consists of items such as, “people in my family have confidence in me”, “I know my family will always stand by me”, and “people in my family provide me with help finding solutions to my problems.” Items in the perceived family support dimension include “I have at least one friend I can tell
anything to”, “Even when I am with my friends I feel alone” (reverse coded), and “I share the same approach to life that many of my friends do”. Reported cronbach alphas demonstrate that the PSR has good internal consistency, (alphas range from .75 to .87). Higher scores represent greater perceived social support.

*Daily Record Measures*

The following measures were completed for 7 consecutive days.

*Mood.* Morning and evening negative affect was assessed with a short form of the negative affect subscale of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Participants were instructed at around lunch or mid afternoon to “circle the number that best describes how much you experienced the following emotions so far today” and at bed time to “circle the number that best describes how much you experienced the following emotions since your last diary entry.” The following adjectives were rated by the participants: guilty, nervous, irritable, sad, afraid, and upset. A 3 point Likert scale was used ranging from 1 (not at all) to 3 (a lot). Cronbach alpha for the short form of the scale showed adequate internal consistency (α = .73). The mean autocorrelations for negative affect was .37 for AM negative affect and .34 for PM negative affect for a one day lag.

*Daily reactive rumination.* Daily reactive rumination was recorded once a day in the evening before going to sleep. Participants described “the most bothersome event or problem you had with someone in your family today. It might have been something as minor as your child’s distress over something that happened at school or it might have been a major argument or disagreement.” Participants responded to three items that represented stress-reactive repetitive thinking: “Did you find it hard to stop thinking
about the problem afterward?”, “When thinking about the problem afterward, did your thoughts tend to dwell on negative aspects of it, or how badly you felt about it?”, and “Did thinking about the problem tend to make the problem seem worse or make you feel worse about it?”. Similar questions were employed by Trapnell and Campbell (1995) and Wood et al. (1990). A 4-point Likert scale was employed ranging from 1 (not at all) to 5 (a lot). Cronbach alpha for the three-item scale indicated high internal consistency (\( \alpha = .90 \)). Concern was raised about item overlap between the third item, “Did thinking about the problem make you feel worse about it?” and reported negative affect. The item was therefore dropped from further analyses. This is consistent with concerns in the literature related to item overlap between rumination scales and depressive symptomatology (Conway, Csank, Holm, & Blake, 2000; Cox, Enns, & Taylor, 2001; Robinson & Alloy, 2003; Segerstrom, Tsao, Alden and Craske, 2000; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Cronbach alpha for the two item scale indicated high internal consistency (\( \alpha = .89 \)). The correlation between the two-item and three-item scales was .98, suggesting that no significant information was lost by employing a more stringent two-item scale. The mean autocorrelation for DRR was .32 for a one day lag, \( p < .001 \).

Results

Univariate and Bivariate Analyses

First, the means and standard deviations were calculated for both the time variant and time invariant (level one and level two, respectively) study variables. Level one variables were aggregated for each participant over all time points. Table 1 reports the means and standard deviations for all study variables included in the present investigation.
Pearson product moment correlations between aggregated level 1 study variables indicated that evening negative affect was significantly related to morning negative affect, and DRR, $r(157) = .81$, $p < .001$, and $r(157) = .40$, $p < .001$, respectively. Further, DRR was significantly associated with morning negative affect, $r(157) = .17$, $p < .05$.

Next, correlations between the daily variables (aggregated for each individual across all time points), gender, RRS, and perceived social support were calculated. The analyses revealed that evening negative affect was significantly related to RRS, $r(156) = .28$, $p < .001$. DRR was significantly correlated with RRS and perceived social support, $r(174) = .43$, $p < .001$, and $r(174) = -.18$, $p < .025$, respectively. Gender was significantly related to morning and evening negative mood, $r(157) = .18$, $p < .50$, and $r(157) = .16$, $p < .05$, respectively. Gender and DRR were not significantly related, $r(175) = .14$, $p > .05$.

Correlations among level 2 variables revealed that RRS was significantly associated with gender and perceived social support, $r(175) = .21$, $p < .01$, and $r(175) = -.33$, $p < .001$, respectively.

Hierarchical Linear Modeling

Hierarchical linear modeling (HLM) was used to examine relations between negative affect, RRS, DRR and perceived social support. First, we examined within-person variation in negative affect as a function of within-person variation in daily reactive rumination and between-person variation in RRS. Repeated measures from the diary were nested within persons, which in turn were nested within couples. Secondly, we examined within-person variation in DRR as a function of both within-person and between-person variables. We used a random-intercept model in which the intercept is specified as random and the slopes are specified as fixed. In addition, each predictor
within-person variable was centered around the mean of each participant’s mean score during the study.

Prior to specifying models testing the research questions related to daily fluctuations in negative affect and DRR, demographic variables (gender, age, years of education and family income) were modeled individually onto the intercept of evening negative affect and DRR, (i.e. the null model, the model predicting evening negative affect with no explanatory variables, while controlling for morning negative affect and previous day’s DRR). Only gender was found to be significantly related to evening negative affect and DRR. This is consistent with the literature suggesting that women experience higher levels of psychological distress than men (Conger, Lorenz, Elder, Simons, & Ge, 1993; Wittchen, Essau, von Zerssen, Krieg, & Zaudig, 1992; for a review see Nolen-Hoeksema, 1987), and ruminate more (Nolen-Hoeksema, 1987, 1991). Consistent with recommended multilevel model specifications, we dropped the nonsignificant demographic predictors and retained only gender in subsequent analyses for evening negative affect (Bryk & Raudenbush, 1992; Snijders & Bosker, 1999; Kreft & DeLeeuw, 1998) and DRR.

Does a reactive ruminative style predict fluctuations in concurrent (same day) and lagged (next day) negative affect? Does DRR predict concurrent and lagged negative affect? Do RRS and DRR interact to predict concurrent and lagged negative affect?

Initially, we specified a model predicting evening negative affect that included morning negative affect and gender. Morning NA and gender significantly predicted evening negative affect, $\beta = .21$, $t(544) = 2.66$, $p < .01$ and $\beta = .06$, $t(132) = 3.50$, $p < .01$, respectively. Next, we included RRS into level 2 of the model. Results indicated that
RRS significantly predicted evening negative affect, $\beta = .08, t(131) = 4.66, p < .001$. Both morning negative affect and gender remained significantly associated with evening negative affect. Following, DRR was included in the model. Daily rumination significantly predicted evening negative affect, $\beta = .15, t(542) = 7.15, p < .001$. Negative affect no longer significantly predicted evening affect, $\beta = .11, t(542) = 1.32, p > .10$.

Finally, we interacted RRS with DRR to predict evening negative affect. The interaction between RRS and DRR was marginally significant, $\beta = .04, p = .05$. Table 2 presents the final model, including the RRS-DRR interaction. Figure 1 illustrates the relationship between RRS and DRR on evening negative affect, controlling for morning negative affect and gender. As can be seen, for participants who were higher in RRS, increases in daily reactive rumination were associated with greater increases in negative affect than they were for those lower in RRS.

We then specified a similar model predicting next day evening negative affect that included previous day evening affect, previous day DRR, gender, RRS. The model was built up similarly to the model specified for same day fluctuations in negative mood. In the final model, only RRS significantly predicted next day evening negative affect, $\beta = -.06, t(131) = 3.00, p < .05$. Table 2 presents results for the entire model for next day negative affect.

_**Is DRR predicted primarily by RRS? Does perceived social support moderate the effects of RRS on DRR?**_ We specified a model predicting DRR that included evening negative affect, gender, RRS and perceived social support. Evening negative affect was included in the model since negative affect and rumination have been found to covary together in previous studies (Lavallee & Campbell, 1995; Wood et al., 1990). Initially,
gender and evening negative affect were included in the model. Results indicated that
gender and same day evening negative affect were significantly associated with DRR, \( \beta = .11, t(132) = 2.14, p < .05 \), and \( \beta = 1.06, t(544) = 7.96, p < .001 \). Next, RRS, perceived
social support and their interaction were added to the model. The interaction between
perceived social support and RRS was a significant predictor of DRR, \( \beta = -.13, t(129) = -
3.01, p < .01 \) (see Table 3 for the final model for Same Day Daily Reactive Rumination).
Figure 2 illustrates the relationship between perceived social support and RRS on DRR.
As can be seen in Figure 2, perceived social support attenuated the effect of RRS on DRR
for those reporting higher levels of RRS. Perceived social support did not attenuate the
relationship between RRS and DRR for those reporting lower levels of RRS.

Next, we specified a model predicting next day daily reactive rumination and
included previous day DRR, previous day evening negative affect, RRS, perceived social
support and their interaction. The interaction between perceived social support and RRS
and the independent effect of RRS were the only significant predictors of next day stress-
reactive rumination, \( \beta = -0.08, t(129) = -2.15, p < .05 \), and \( \beta = 0.30, t(129) = 5.18, p <
.001 \), respectively (see Table 3, Next Day Stress-Reactive Rumination). Figure 3
illustrates the relationship between perceived social support and RRS on DRR. Similar to
Figure 2, perceived social support moderated the relationship of RRS to next day DRR
for those higher in RRS such that the association between RRS to DRR was attenuated.

Discussion

Same day negative affect

As predicted, a reactive ruminative style and daily reactive rumination had
significant and independent associations with same day evening negative affect, after
controlling for morning negative affect. Of greater interest, our findings support Wood and her colleagues (1990) suggestion that some people are able to exit the cycle of rumination whereas others do not exit the cycle and remain distressed longer and more intensely. As compared to those low in ruminative style, when those with greater dispositions to perseverate reported engaging in higher levels of daily rumination they tended to report greater increases in daily negative affect. To our knowledge, our findings are the first to support the supposition that individuals lower in RRS do engage in DRR, but tend not to experience as severe an emotional reaction as do those with higher levels of RRS when engaging in DRR.

Experimental data suggest possible causes for the differences that may exist between those high and low in RRS who engage in DRR. First, RRS has been associated with focusing on the causes and meaning in response to intrusive thoughts, after controlling for depression, anxiety, and worry level (Nolen-Hoeksema & Morrow, 1991; Watkins, 2004). Individuals with a high dysphoric ruminative style have been demonstrated to provide more reasons to explain their depressive episodes than individuals with low dysphoric ruminative styles (Watkins & Mason, 2002). Extended focus on the causes and meaning of intrusive thoughts may result in prolonging the perseverating process in individuals with higher RRS. As a result, when engaging in DRR, higher RRS individuals may experience a more severe heightening of negative mood on a daily basis.

Next day negative affect

Consistent with previous research (Nolen-Hoeksema et al., 1993; Wood et al., 1990), RRS variability predicted fluctuations in negative affect across days. This result
supports the extensive literature suggesting that RRS is a vulnerability factor for negative affect (Spasojević and Alloy, 2003; Trapnell and Campbell, 1999; Treynor et al., 2003; Wood et al., 1990). In other words, participants who initially reported a greater tendency to perseverate were at greater risk for experiencing more daily negative affect.

Furthermore, we found support for our prediction that every day is a new day, in terms of the effects of daily reactive ruminating on negative affect. In other words, previous day reactive rumination did not predict next day evening negative affect, after controlling for previous evening negative affect. Previous research suggests that negative events are more salient within a shorter time frame (Stadler & Hokanson, 1998; DeLongis et al., 2004), but may have limited impact over time (Taylor, 1991). How an individual copes with the negative event may therefore impact immediate mood, but does not appear to impact subsequent moods.

The results of the present study support an integrative coping perspective (Lazarus, 1993; Moos & Holahan, 2003). Such a model of coping attends to the increasingly accepted belief (David & Suls, 1999; DeLongis & Holtzman, in press) that person and situation interact to determine coping responses to specific stressors. First, as dispositional models would suggest, an individual higher in RRS does tend to respond more frequently to stressors with greater rumination. Second, and more importantly in our opinion, the amount of rumination in response to stressors varies within individuals, suggesting that person-context interactions exist that may explain variation in daily reactive rumination. This is consistent with findings from the larger coping literature of person-context interactions in coping strategies (Lazarus & Folkman, 1984; Maybery, 2003; Park et al, 2004a; Park et al., 2004b).
Social Support and Rumination

In the present study, we expected that perceived social support would moderate the association between a reactive ruminative style and daily reactive rumination. Our results support our predictions, even when controlling for both concurrent negative affect (within day analyses) and previous day reactive rumination (across days analyses). Specifically, perceived social support appears to attenuate the relationship of RRS to both same day and next day DDR for those higher in RRS. In other words, feeling connected to a social network wherein individuals have friends and family members who respect them, care for them and to whom they can turn seems to protect individuals higher in RRS from engaging in DRR.

Our results provide strong support for previous findings concerning the buffering potential of feeling socially connected among vulnerable individuals (DeLongis et al., 2004; Manne et al., 2003; Nolen-Hoeksema & Davis, 1999). Individuals with a greater tendency to ruminate suffer from weaker networks, lower problem-solving ability, and more interpersonal strain (Lyubomirsky & Nolen-Hoeksema, 1995; Spasojevic et al., 2004). Individuals with a greater disposition to ruminate may benefit from sensing that they have people to turn to when in need and people who respect them and their opinions. Previous research has concluded that being able to talk about one’s feelings and thoughts with others, especially when there is a tendency to remain stuck in a perseverating and negative-mood-enhancing cycle, is beneficial (Nolen-Hoeksema & Davis, 1999; Rimé, 1995). The benefit may follow from being able to receive both informational and emotional support and a ‘push’ towards active problem solving.
Alternatively, findings also suggest that ruminating is linked to negative thinking and poorer interpersonal problem solving. It has been proposed that rumination enhances the appraisal of problems as threats and enhances self-doubt in the ruminator’s ability to solve problems (Lyubomirsky & Nolen-Hoeksema, 1995). Yet, social resources have been found to bolster approach and decrease avoidance coping strategies (Holohan & Moos, 1987, 1991; Holohan et al., 1997). It is possible that both perceiving support and being cared for increase self-esteem and self-confidence and pull for fewer threat appraisals. As a result of feeling less overwhelmed when experiencing a stressor, individuals with a tendency to cope via reactive rumination may default less often to their typical, detrimental coping in response to a stressor.

Limitations and Future Directions

The present study was designed to examine the relations of reactive ruminative style and daily reactive rumination with negative affect. We further sought to examine the moderating role of perceived social support on daily reactive rumination. In the present investigation, we extend reactive ruminative style theory to include everyday stressors and thoughts about the self, not limiting ruminative thoughts to major life stressors and mood. However, a number of limitations exist in the present study.

First, the present study measured DRR in response to the most bothersome family-related event of the day. Other daily events have been associated with negative affect and the coping process (Almeida et al., 2002; Bolger, et al., 1989). Further, Stone (1987) suggested that the content of the stressor affects its impact on symptoms. The generalizability of our results to all stressors may therefore be premature. Future research should attempt to both extend these results to other contexts (i.e. types of stressors -
work, financial, interpersonal), and to delineate the types of family-related stressors (i.e. marital, child/stepchild, previous spouse, household work) that are associated with increases in DRR and negative affect.

Second, recent concerns have been raised about the validity and reliability of paper diary methods (Broderick, Schwartz, Shiffman, Hufford, Stone, 2003). However, a number of steps were taken in the present study to increase compliance. First, diary entries were yoked with lunchtime and bedtime, which increases compliance and adherence (Dunbar-Jacob & Schlenk, 2001). Second, our methods included one-on-one interviews to acquaint the participants with the methodology, and to make the initial meeting pleasant, a factor demonstrated to enhance cooperation (Twitchell, Hertzog, Klein, & Schuckit, 1992). Finally, daily reactive rumination was measured in response to an open-ended question, and such questions are not well suited to data collection via palm pilots (Coyne, et al., manuscript in preparation). Given the emerging debate in the literature concerning paper diary methodology, future research should attempt to replicate the present findings with the use of electronic data recorders, such as palm pilots or personal computers. Personal computers may be better suited for the types of questions posed in the present study since it requires answers to open-ended questions.

Additionally, at the idiographic level, the use of a variety of forms of coping have been found to be associated with perceptions of stressor controllability (Lazarus & Folkman, 1984; Park, Armeli, & Tennen, 2004a), perceptions of stressor severity (David & Suls, 1999), type of stressor (Almeida et al., 2002; Bolger et al., 1989; Maybery, 2003) and the accumulation of negative events (Lepore & Evans, 1996; Park, Armeli, & Tennen, 2004b; Tennen, Affleck, & Armeli, 2003). We have provided evidence that
supports that reactive rumination varies on a daily basis within individuals. It may, thus, be useful for future studies to investigate these stressor qualities in terms of their ability to explain fluctuations in coping via daily reactive rumination.
References


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Table 1

*Means and Standard Deviations for level 1 and level 2 study variables*

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>Std. dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1 (time variant)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily reactive rumination</td>
<td>175</td>
<td>1.92</td>
<td>0.66</td>
</tr>
<tr>
<td>Morning negative affect</td>
<td>157</td>
<td>1.25</td>
<td>0.24</td>
</tr>
<tr>
<td>Evening negative affect</td>
<td>157</td>
<td>1.29</td>
<td>0.26</td>
</tr>
<tr>
<td><strong>Level 2 (time invariant)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reactive ruminative style</td>
<td>176</td>
<td>2.99</td>
<td>0.75</td>
</tr>
<tr>
<td>Perceived social support</td>
<td>176</td>
<td>4.06</td>
<td>0.62</td>
</tr>
</tbody>
</table>
Table 2

Hierarchical Linear Model (HLM): Relations of Gender, Morning Negative Affect, Reactive Ruminative Style (RRS), Daily Reactive Rumination (DRR), and the Interaction between RRS and DRR to Same day and Next Day Evening Negative Affect.

<table>
<thead>
<tr>
<th>Effecta</th>
<th>Same Day Evening Negative Affect</th>
<th>Next Day Evening Negative Affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morning negative affect</td>
<td>0.11 0.08</td>
<td>_ _</td>
</tr>
<tr>
<td>Previous day evening negative affect</td>
<td>_ _</td>
<td>-0.11†† 0.06</td>
</tr>
<tr>
<td>Daily reactive rumination</td>
<td>0.14*** 0.02</td>
<td>0.02 0.03</td>
</tr>
<tr>
<td>Level 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.04 0.01</td>
<td>0.02 0.02</td>
</tr>
<tr>
<td>Reactive ruminative style</td>
<td>0.08*** 0.02</td>
<td>0.06** 0.02</td>
</tr>
<tr>
<td>Reactive ruminative style x daily reactive rumination</td>
<td>0.04† 0.02</td>
<td>-0.02 0.02</td>
</tr>
</tbody>
</table>

a All variables, except gender, have been standardized.

Note. *p < .05, **p < .01, ***p < .001.
†p = .05
‡‡p < .10
Table 3

*Hierarchical Linear Model (HLM): Relations of Gender, Morning Negative Affect, Ruminative Personality Style, and Perceived Social Support to Same day and Next Day Daily Reactive Rumination.*

<table>
<thead>
<tr>
<th>Effect</th>
<th>Same Day Daily Reactive Rumination</th>
<th>Next Day Daily Reactive Rumination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \beta )</td>
<td>SE</td>
</tr>
<tr>
<td>Level 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evening negative affect</td>
<td>1.06***</td>
<td>0.13</td>
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<tr>
<td>Previous day daily reactive rumination</td>
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<td></td>
</tr>
<tr>
<td>Level 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.04</td>
<td>0.05</td>
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<tr>
<td>Reactive ruminative style</td>
<td>0.27***</td>
<td>0.06</td>
</tr>
<tr>
<td>Perceived social support</td>
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<td>0.05</td>
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<tr>
<td>Reactive ruminative style x perceived social support</td>
<td>-0.13**</td>
<td>0.04</td>
</tr>
</tbody>
</table>

*All variables, except gender, have been standardized.*

Note. *p < .05, **p < .01, ***p < .001.*
Figure Caption

*Figure 1.* Same day evening negative affect as a function of reactive ruminative style and daily reactive rumination.

*Figure 2.* Same day daily reactive rumination as a function of perceived social support and ruminative personality style.

*Figure 3.* Next day daily reactive rumination as a function of perceived social support and ruminative personality style.
Figure 1

- High Daily Reactive Rumination
- Low Daily Reactive Rumination

Same Day Evening Negative Affect

Reactive Ruminative Style
Figure 2

- High Reactive Ruminative Style
- Low Reactive Ruminative Style

Same Day Daily Reactive Rumination

Perceived Social Support
Figure 3

- High Reactive Ruminative Style
- Low Reactive Ruminative Style

Next Day Daily Reactive Rumination

Perceived Social Support