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### Journal

International Journal of Psychology, 54(3)

### ISSN

0020-7594

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### Publication Date

2019-06-01

### DOI

10.1002/ijop.12466

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## Sadness and ruminative thinking independently depress people's moods

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Depression and rumination often co-occur in clinical populations, but it is not clear which causes which, or if both are manifestations of an underlying pathology. Does rumination simply exacerbate whatever affect a person is experiencing, or is it a negative experience in and of itself? In two experiments we answer this question by independently manipulating emotion and rumination. Participants were allocated to sad or neutral (in Experiment 1), or sad, neutral or happy (Experiment 2) mood conditions, via a combination of emotionally evocative music and autobiographical recall. Afterwards, in both studies, participants either ruminated by thinking about self-relevant statements or, in a control group, thought about self-irrelevant statements. Taken together, our data show that, independent of participants' mood, ruminators reported more negative affect relative to controls. The findings are consistent with theories suggesting that self-focus is itself unpleasant, and illustrate that depressive rumination comprises both affective and ruminative components, which could be targeted independently in clinical samples.

**Keywords:** Rumination; Self-focus; Mood.

Rumination involves repeatedly thinking about the meaning, causes and consequences of negative personal concerns or moods (Nolen-Hoeksema, 1991). Although people report ruminating in order to alleviate their distress, that strategy often backfires. Rather than quelling negative thoughts and feelings, rumination prolongs and intensifies them (for review, see Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Indeed, self-reported rumination predicts the onset of depressive moods and is associated with longer depressive episodes (Just & Alloy, 1997; Kuehner & Weber, 1999; Nolen-Hoeksema, Morrow, & Fredrickson, 1993; Spasojević & Alloy, 2001). Rumination exacerbates other negative affective states, too, increasing feelings of grief, stress and anger, and making eating disorders worse (Davis, Nolen-Hoeksema, & Larson, 1998; Roger & Najarian, 1998; Rusting & Nolen-Hoeksema, 1998).

Although it is clear that rumination exacerbates negative feelings, less clear is the extent to which rumination causes these negative feelings on its own—that is, independent of the mood state that precedes it. Answering this question is the primary aim of the current studies. On the

one hand, because rumination involves focusing on feelings and their implications, it should make those feelings and implications more salient, regardless of their valence. According to this salience hypothesis, rumination makes depressed people feel worse because the thoughts they are ruminating about just so happen to be negative. It follows that if people were in a neutral mood, rumination would have little to no effect, and if people were in a positive mood, rumination would make positive thoughts more salient and *improve* mood.

On the other hand, rumination is by definition a form of self-focus, which should cause negative affect regardless of people's prior mood (Rude, Little Maestas, & Neff, 2007). Indeed, a number of theories suggest that self-focus causes discomfort by highlighting the discrepancies between people's current and desired states (for reviews see Carver & Scheier, 1990; Duval & Wicklund, 1972; Fejfar & Hoyle, 2000; Higgins, 1987; Mor & Winquist, 2002). In one study, people reported their mood before and after describing the type of person they wished to be. Focusing on these aspects of the self led people to feel more dejected if they also believed there

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The authors contributed equally to the writing of the manuscript. AJ and JH developed the concept and designed the study. AJ, BC, and JH conducted analyses.

was a large discrepancy between who they wished to be and who they actually were (Higgins, Bond, Klein, & Strauman, 1986). According to this self-focus hypothesis, then, rumination should draw attention to the self and lead people to realise they have failed to live up to their expectations—producing negative affect regardless of their prior mood.

The existing experimental work on how rumination affects mood does not clearly distinguish between the salience and self-focus accounts. In this work (e.g., Ciesla & Roberts, 2007; Wisco & Nolen-Hoeksema, 2009) people are typically grouped based on their prior level of depression or dysphoria, and then are led to ruminate by reading a series of statements focusing their attention on themselves and their current emotions and feelings (e.g., “Think about why you turned out this way,” and “Describe the possible consequences of your feelings”; Nolen-Hoeksema & Morrow, 1993). Rumination usually prolongs negative moods in depressed/dysphoric people, but has little to no effect on non-depressed/non-dysphoric people (for a review see Nolen-Hoeksema et al., 2008). Such a pattern implies that rumination exacerbates people’s negative moods by making negative thoughts more salient—otherwise, rumination should lead non-depressed/non-dysphoric people to feel more negative, too.

But there are problems with this interpretation. One is that in these studies mood is not manipulated experimentally, raising the possibility that other individual differences could explain the effects. For example, depressed people’s extreme negative self-views might make them, especially, prone to interpret self-relevant prompts through a negative lens, leading to an inflated estimate of the effects of rumination. Moreover, depression co-varies with ruminative tendencies, suggesting that depressed participants may already be ruminating when the experiment begins, or would be more easily led to do so (e.g., Thomsen, 2006). These and other differences between depressed and non-depressed groups will obscure the extent to which rumination causes negative affect independent of mood.

The few studies that have taken an experimental approach have not provided clear support for either the salience or self-focus accounts. One study (Wisco & Nolen-Hoeksema, 2009), which experimentally manipulated mood in a non-depressed sample, found that ruminating made sad people happier and happy people sadder, supporting neither hypothesis (and, in any case, had no control group to which ruminators could be compared). Another (Gruber, Harvey, & Johnson, 2009) found that ruminating about a positive event indeed led people to experience more positive affect, but because people ruminated on the very event that elicited their positive mood (rather than ruminating while they happened to be in a positive mood), the interpretation of this effect is also unclear.

Distinguishing between the salience and self-focus accounts therefore requires an experiment in which both mood and rumination are manipulated independently. That was the aim of the experiments reported here. In Experiment 1 we led people to feel sad or neutral before they either ruminated or (in a control condition) were prevented from ruminating. We made different predictions regarding the effects of rumination in the sad versus the neutral mood conditions. In the sad condition, we predicted that rumination would cause more sadness relative to not ruminating, consistent with both the salience and self-focus accounts. In the neutral condition, however, we had competing predictions: If the salience account is correct, such that rumination makes the content of one’s thoughts more accessible, then ruminating in a neutral mood (i.e., with relatively few negative thoughts) should have little or no effect. If the self-focus account is correct, such that rumination itself produces negative affect, ruminating in a neutral mood should lower participants’ moods.

## EXPERIMENT 1

### Method

#### *Participants*

Based on the number of participants used in similar research (Ciesla & Roberts, 2007; Wisco & Nolen-Hoeksema, 2009) we aimed for 30 participants per between-subjects cell. We recruited a total of 134 psychology students (33 males) to participate in exchange for course credit.

#### *Design and procedure*

We used a 2 (Mood Condition: Sad, Neutral) × 2 (Rumination Condition: Rumination, Control) × 3 (Time of Mood Measurement: Pre-mood Manipulation, Post-mood Manipulation, Post-rumination Manipulation) mixed design with time of measurement as a within subject factor.

We seated participants at an iMac 21-inch computer workstation in light and sound attenuated experimental cubicles, where they completed a demographic form. To ensure the groups were comparable on other dimensions, we first asked participants to complete measures of depression (the Centre for Epidemiological Studies Depression [CES-D] scale; Radloff, 1977), anxiety and stress (the anxiety and stress subscales of the Depression Anxiety and Stress Scale; Lovibond & Lovibond, 1995), ruminative tendencies (the Response Styles Questionnaire; Treynor, Gonzalez, & Nolen-Hoeksema, 2003), and socially desirable responding (the 13-item Marlow-Crowne Social Desirability Scale; Reynolds,

1982). Then, to gather pre-mood manipulation ratings, we asked participants to rate their current mood on a scale from 1 (*Very Sad*) to 9 (*Very Happy*; similar single-item mood measures have been used in research on rumination, see Lyubomirsky et al., 1998).

Then the experiment proper began. To manipulate participants' mood, we asked them to recall and write about either a sad or neutral autobiographical event while listening to emotionally congruent music (a procedure adapted from Clark & Teasdale, 1985; for a similar procedure, see Halberstadt & Niedenthal, 1997). Specifically, participants in the sad condition saw the following instructions:

We are interested in the process by which people recall events, experiences, and feelings from their lives. During this task, try to recall one specific life event during which you have felt lonely, sad, rejected, or hurt, and write about it in as much as detail as you can. Concentrate on thoughts and feelings you had at that time and really try to re-experience the event. Music will play in the background, to help your concentration. You will have 8 minutes for this task. Try to write for the entire time.

The instructions were the same for participants in the neutral condition, except that the second sentence read "During this task, try to vividly think about making a trip to the grocery store and write down all the details of the store and specific acts involved in grocery shopping." Throughout the mood manipulation task, participants in the sad condition listened to the orchestral introduction to Prokofiev's (1934) "*Russia Under the Mongolian Yoke*" recorded at half speed, while participants in the neutral condition listened to Dvorak's (1893) "*The New World Symphony*" recorded at normal speed.

After 8 minutes, participants rated their current mood for the second time (the post-mood manipulation rating). Then we manipulated whether participants ruminated or did not ruminate using a modified version of Morrow and Nolen-Hoeksema's (1990) procedure. Participants in both the rumination and the control conditions saw the following instructions:

The next task is an imagination task. We would like you to focus your mind on a series of ideas and thoughts for the next 4 minutes. You will see a series of statements. Read each item slowly and silently to yourself, and use your imagination and concentration to focus your mind on each of the ideas. Spend a few moments visualizing and concentrating on each item as much as you can. You may be asked to recall and report your thoughts and describe what you did during the task at the end of the study. Music will play in the background to help your concentration.

Then the music from the mood manipulation resumed and each statement appeared one at a time on the computer screen. In Morrow and Nolen-Hoeksema's original procedure, participants in the rumination condition

saw a total of 40 emotion-focused, symptom-focused, and self-focused statements. But because many of those statements confound mood and rumination (e.g., "Think about how sad you feel"), we selected only the eight statements that did not explicitly contain mood concepts (e.g., "Think about how you feel about your friendships"). Participants in the control condition saw eight different statements that instead encouraged thoughts about external events that were unrelated to symptoms, emotions, or the self (e.g., "Think about the shape of a large black umbrella"). Each statement remained on the screen for 30 seconds, and advanced automatically such that the task lasted 4 minutes. Afterwards, participants rated their current mood a third time (the post-rumination mood rating).

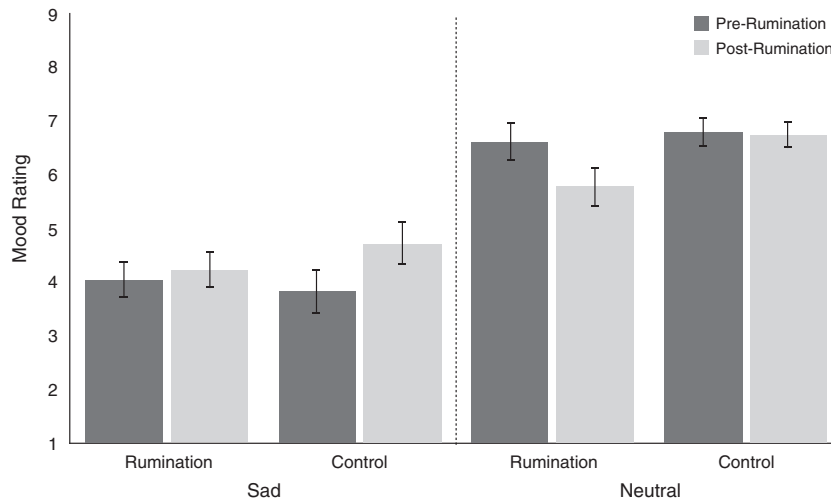
## Results and discussion

### Analysis strategy

We analysed the data in four stages, using a combination of within-subjects and between subjects analyses of variance (ANOVAs). First, we confirmed the success of random assignment in a series of 2 (Mood Condition)  $\times$  2 (Rumination Condition) ANOVAs on the individual differences measured in the study. Second, we confirmed the success of the mood manipulation using a 2 (Mood Condition)  $\times$  2 (Rumination Condition)  $\times$  2 (Time of Measurement: Pre-mood Manipulation vs. Post-mood Manipulation) mixed model ANOVA. Third, we examined the effects of rumination on mood by repeating the second analysis on pre-rumination versus post-rumination mood scores. Finally, we examined the effects of rumination on mood a second way, in a univariate 2 (Mood Condition)  $\times$  2 (Rumination Condition) between subjects ANOVA focussing only on participants' final reported mood.

### Randomisation check

We first examined whether randomisation was successful by conducting 2 (Mood Condition)  $\times$  2 (Rumination Condition) ANOVAs on age, participants' depression, rumination, anxiety, stress, social desirable responding scores and their pre-manipulation mood ratings. The four groups were similar on all measures, with two exceptions: (a) participants in the neutral mood condition (but not the sad condition) who were assigned to the rumination condition had lower trait rumination scores than participants assigned to the control condition,  $F(1, 130) = 4.67$ ,  $MSE = 363.94$ ,  $p = .03$ ,  $\eta_p^2 = .04$ ; (b) participants in the neutral condition also reported overall more stress than participants in the sad condition,  $F(1, 130) = 5.03$ ,  $MSE = 40.06$ ,  $p = .03$ ,  $\eta_p^2 = .04$ . But because these patterns failed to replicate in Experiment 2, we do not discuss them further. Including measures



**Figure 1.** Mean mood ratings before the rumination induction (“Pre-Rumination”), and after the rumination induction (“Post-Rumination”), grouped according to whether participants felt sad or neutral, and whether they had ruminated or were controls. Error bars represent 95% within subjects confidence intervals for the pre-rumination and post-rumination effects.

of depression, stress, anxiety, rumination and socially desirable responding as covariates also did not change the nature of the results in either experiment.

### Mood manipulation check

We then examined whether our mood manipulation was successful by conducting a 2 (Mood Condition)  $\times$  2 (Rumination Condition)  $\times$  2 (Time of Measurement) mixed model ANOVA, focusing on the pre-mood and post-mood manipulation ratings. There was an interaction between mood condition and time of measurement,  $F(1, 130) = 175.71$ ,  $MSE = 0.93$ ,  $p < .01$ ,  $\eta_p^2 = .58$ . Before the mood manipulation, participants assigned to the sad and neutral conditions reported similar moods. Indeed, subtracting the average mood rating of the sad condition from that of the neutral condition produced a raw effect of 0.38, 95% CI  $[-0.08, 0.83]$ ,  $t(132) = 1.64$ ,  $p = .10$ ,  $d = 0.28$ .<sup>1</sup> But after the mood manipulation, participants who thought about a sad event reported feeling sadder than participants who thought about a neutral event ( $-2.77$ , 95% CI  $[-3.26, -2.29]$ ,  $t(132) = -11.28$ ,  $p < .01$ ,  $d = -1.95$ ). There were no effects involving rumination condition, unsurprisingly given that the rumination condition had not yet been assigned.

### Effects of rumination and prior mood

To answer our primary question—Does rumination intensify people’s pre-existing moods, or does it cause people to feel more negative regardless of their prior

mood state?—we first focused on how participants’ moods changed from before to after the rumination manipulation (a within subject comparison). Accordingly, we repeated the mixed model analysis of variance using just the pre-rumination and post-rumination mood ratings, which revealed an interaction between rumination condition and time of measurement,  $F(1, 130) = 10.31$ ,  $p < .01$ ,  $\eta_p^2 = .07$ : participants who ruminated reported feeling sadder (a raw effect of  $-0.32$ , 95% CI  $[-0.68, 0.05]$ ,  $t(65) = -1.73$ ,  $p = .09$ ,  $d = 0.16$ ), but control participants reported feeling happier (a raw effect of 0.38, 95% CI  $[0.05, 0.72]$ ,  $t(67) = 2.26$ ,  $p = .03$ ,  $d = 0.20$ ). There was no three-way interaction with mood,  $F(1, 130) = 0.02$ ,  $p = .89$ ,  $\eta_p^2 < .01$ ), though inspection of Figure 1 shows that the two-way interaction appears driven more strongly by the neutral condition—an unexpected result given that rumination typically exacerbates negative moods. Nevertheless, the results better support the self-focus than the salience account, because the salience account predicts negative effects only in the sad condition. Finally, there was an interaction between mood condition and time of measurement,  $F(1, 130) = 17.53$ ,  $MSE = 0.93$ ,  $p < .01$ ,  $\eta_p^2 = .12$ . Overall, participants in the sad condition reported better moods after the rumination/control manipulation compared to before (a raw effect of 0.52, 95% CI  $[0.15, 0.90]$ ,  $t(64) = 2.79$ ,  $p = .01$ ,  $d = 0.31$ ), but those in the neutral condition reported worse moods ( $-0.42$ , 95% CI  $[-0.73, -0.11]$ ,  $t(68) = -2.69$ ,  $p = .01$ ,  $d = -0.22$ ).

As a second way to examine our primary research question, we focused just on participants’ final mood reports (a between subjects comparison). As the grey bars

<sup>1</sup>We calculated Cohen’s  $d$  using the pooled variance of two independent groups as the standardiser for between subjects comparisons, and using the pooled variance of the two time points for within subject comparisons.



in Figure 1 show, participants who ruminated reported worse moods than participants who did not (a raw effect of  $-0.85$ , 95% CI  $[-1.50, -0.21]$ ,  $t(132) = -2.62$ ,  $p = .01$ ,  $d = -0.45$ ). A 2 (Mood Condition)  $\times$  2 (Rumination Condition) ANOVA on the post-rumination mood measure confirmed a main effect of rumination,  $F(1, 130) = 6.61$ ,  $p = .01$ ,  $\eta_p^2 = .05$ , and no interaction with mood,  $F(1, 130) = 0.66$ ,  $p = .42$ ,  $\eta_p^2 = .01$ , again consistent with the self-focus hypothesis. Of less importance was a main effect of mood. Participants in the sad condition reported more negative moods at the end of the study than participants in the neutral mood condition,  $F(1, 130) = 38.14$ ,  $MSE = 2.77$ ,  $p < .01$ ,  $\eta_p^2 = .23$ .

Together, these findings suggest that rumination can produce worse moods even when people feel relatively neutral—a conclusion at odds with the idea that rumination exacerbates negative moods only by making the negative content of one's thoughts more salient. The pattern better supports the idea that rumination, as a form of self-focus, is negative in and of itself (Carver & Scheier, 1990; Higgins, 1987).

Of course, a stronger test of that claim would be to examine how rumination affects people who are in a positive mood—when there is an opportunity for rumination to *increase*, perhaps through a salience mechanism, the intensity of people's existing mood. Therefore, in Experiment 2 we added a condition in which participants recalled a time they felt happy. If rumination works by increasing the salience of positive emotions and thoughts, it should make participants in the happy condition feel happier. But if rumination works by increasing self-focus and highlighting differences between people's ideal and actual selves, it should worsen participants' moods even in the happy condition.

## EXPERIMENT 2

### Method

#### Participants

Two hundred and twelve students (60 males) participated in the experiment. Of these participants, 131 were recruited via the Psychology Department's participant pool in exchange for course credit, and 81 were recruited through a student job agency and were paid NZ\$12 as reimbursement for travel expenses.

#### Design and procedure

The design and procedure were identical to that of Experiment 1, except that we added a happy mood condition, producing a 3 (Mood Condition: Sad, Neutral, Happy)  $\times$  2 (Rumination Condition: Rumination, Control)  $\times$  3 (Time of Mood Measurement: Pre-mood

Manipulation, Post-mood Manipulation, Post-rumination Manipulation) mixed design, with time of measurement as the within subject factor. During the mood manipulation, participants in the happy condition read instructions similar those of participants in the sad and neutral conditions, except for an instruction to "try to recall one specific life event during which you have felt elated, happy, energetic, or self-confident." Happy participants also listened to Delibes's (1870) ballet "*Coppelia*" recorded at normal speed.

## Results and discussion

### Analysis strategy

The analytical approach in Study 2 was identical to that of Study 1, with the exception that analyses involving mood condition had three levels to accommodate the addition of a happy mood group.

### Randomisation check

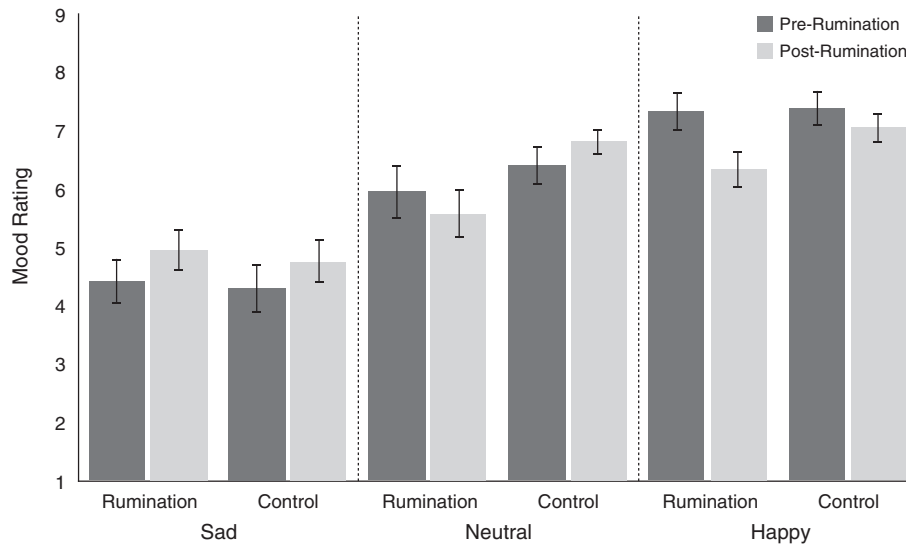
We again examined whether randomisation was successful by conducting 2 (Mood Condition)  $\times$  2 (Rumination Condition) ANOVAs on participants' age, depression, rumination, anxiety, stress, social desirable responding scores and pre-manipulation mood ratings. There were no significant main effects or interactions, suggesting the groups were comparable across these measures.

### Mood manipulation check

To determine whether our mood manipulation was successful, we again conducted a 3 (Mood Condition)  $\times$  2 (Rumination Condition)  $\times$  2 (Time of Measurement) mixed model analysis of variance and focused on the pre-mood and post-mood manipulation ratings. There was an interaction between mood condition and time of measurement,  $F(2, 206) = 56.23$ ,  $MSE = 1.22$ ,  $p < .01$ ,  $\eta_p^2 = .35$ . Before the mood manipulation, participants assigned to the sad, neutral and happy conditions reported similar moods,  $F(2, 209) = 1.51$ ,  $p = .22$ ,  $\eta_p^2 = .01$ . But after the mood manipulation, participants in the sad condition became sadder (a raw effect of  $-1.62$ , 95% CI  $[-2.06, -1.18]$ ,  $t(64) = -7.34$ ,  $p < .01$ ,  $d = -0.97$ ), participants in the happy condition became happier (1.04, 95% CI  $[0.74, 1.35]$ ,  $t(88) = 6.75$ ,  $p < .01$ ,  $d = 0.72$ ), while participants' moods in the neutral condition changed only trivially (0.28, 95% CI  $[-0.11, 0.66]$ ,  $t(57) = 1.45$ ,  $p = .15$ ,  $d = 0.20$ ). There were no effects associated with the rumination manipulation.

### Effects of rumination and prior mood

As in Experiment 1, we examined the primary experimental question in two different ways. First,



**Figure 2.** Mean mood ratings before the rumination induction (“Pre-Rumination”), and after the rumination induction (“Post-Rumination”), grouped according to whether participants felt sad, neutral or happy, and whether they had ruminated or were controls. Error bars represent 95% within subjects confidence intervals for the pre-rumination and post-rumination effects.

we conducted a repeated measures analysis of variance using just the pre-rumination and post-rumination mood ratings, which again revealed an interaction between rumination condition and time of measurement,  $F(1, 206) = 5.99, p = .02, \eta_p^2 = .03$ : participants who ruminated reported feeling sadder (a raw effect of  $-0.37, 95\% \text{ CI } [-0.68, 0.06], t(101) = -2.38, p = .02$ ), but control participants did not (a raw effect of  $0.12, 95\% \text{ CI } [-0.13, 0.36], t(109) = 0.96, p = .34$ ). There was again no three-way interaction with mood but, as in Experiment 1, the effects appear to be driven by the non-sad conditions: as Figure 2 shows, it was the neutral and happy participants who showed the decrease—providing better support for the self-focus than the salience hypothesis. The analysis also revealed an interaction between mood condition and time of measurement,  $F(2, 206) = 14.10, \text{MSE} = 0.92, p < .01, \eta_p^2 = .12$ , such that participants in the sad condition were happier at the end of the study than prior to the rumination/control manipulation (a raw effect of  $0.49, 95\% \text{ CI } [0.13, 0.85], t(64) = 2.74, p = .01$ ), participants in the happy condition were sadder ( $-0.65, 95\% \text{ CI } [-0.94, -0.36], t(88) = -4.47, p < .01$ ), and participants’ moods in the neutral condition did not change ( $0.02, 95\% \text{ CI } [-0.33, 0.36], t(57) = 0.10, p = .92$ ).

In the second analysis, we focused on how participants’ moods compared the third time they made their ratings. A 3 (Mood Condition)  $\times$  2 (Rumination Condition) between subjects ANOVA revealed an interaction,  $F(2, 206) = 3.07, \text{MSE} = 2.68, p = .05, \eta_p^2 = .03$ . As the grey bars in Figure 2 show, rumination decreased the moods of participants in the neutral ( $-1.24, 95\% \text{ CI } [-2.08, -0.41], t(56) = -2.98, p < .01, d = -0.78$ ) and happy conditions ( $-0.72, 95\% \text{ CI } [-1.42, -0.01], t(87) = -2.02,$

$p = .05, d = -0.43$ ), but not in the sad condition (a raw effect of  $0.20, 95\% \text{ CI } [-0.62, 1.01], t(63) = 0.48, p = .63, d = 0.12$ ).

As a whole, these findings closely replicate and extend those of Experiment 1. Rumination again decreased participants’ moods when they felt neutral, and even did so when people felt happy—a finding that is particularly striking given that positive moods provide the opportunity for rumination to make positive emotions and thoughts more salient. The fact that the opposite pattern emerged supports the hypothesis that the self-focus involved in rumination is negative in and of itself (Carver & Scheier, 1990; Duval & Wicklund, 1972; Higgins, 1987).

## GENERAL DISCUSSION

Both negative mood and ruminative thinking are unfortunate features of depression, but because they are naturally—and often methodologically—confounded, it is not clear whether rumination per se contributes to negative mood, or whether it merely exacerbates a depressed person’s mood (which happens to be negative). The current study tested these two possible mechanisms—the self-focus and salience accounts, respectively—by manipulating mood and rumination independently. Our results support the self-focus account; we found that when people felt neutral or happy, they experienced more negative moods following rumination.

Aside from its theoretical implications, the finding that rumination can negatively influence the mood of non-depressed, and even relatively happy individuals, suggests some important practical implications, with hints of future clinical applications. Most obviously,



the findings clarify that “depressive rumination” is potentially dissociable into affective and ruminative components, each of which might require independent clinical intervention. Indeed, the fact that rumination, even in a neutral emotional context, can impair mood, suggests that it may not only accompany depression but also help produce it, particularly for those with vulnerable self concepts (e.g., whose actual and ideal selves are misaligned). In turn, one practical implication of our findings is that treatments that target the ruminative component of depressive episodes, such as mindfulness (see Baer, 2003 for review) and rumination-focussed cognitive behavioural therapy (e.g., Watkins, 2009; Watkins et al., 2007), may also be profitably used in vulnerable populations long before they exhibit any depressive symptoms. Even distraction, operationalised in our control condition and a treatment for depressive rumination in its own right (e.g., Huffziger & Kuehner, 2009), may have a role to play with people particularly prone to self-reflection, but not (yet) suffering any ill-effects of it.

These speculations notwithstanding, we urge caution when extrapolating the current results beyond the laboratory, and in particular to people suffering from clinical depression. It may be the case, for example, that in that population the emotional and cognitive components of depression (i.e., sadness and rumination) are more (or less) strongly interdependent. If so, interventions that target one component independent of the other may be ineffective (or more effective). It is also worth noting that participants in the current studies initially completed questionnaires about their mood and well being, which themselves could have made salient discrepancies or negative material that interacted with rumination later in the study. Although such a process would be consistent with our interpretation of the data, the pretest measures create the potential for overestimating the effects of rumination in nonclinical samples; future studies should consider the role of priming in rumination effects, both as an experimental artefact and as a moderating variable.

Somewhat ironically, given the phenomenon of “depressive rumination” that motivates much of the work in this area, the effects of rumination in the sad mood conditions were less consistent than those in the critical non-negative conditions. In Experiment 1, rumination did produce lower moods relative to the control group, but not relative to participants’ own pre-rumination moods, and neither effect held in Experiment 2. One explanation may be that, unlike many previous studies in the area (Ciesla & Roberts, 2007; Lyubomirsky et al., 1998; Wisco & Nolen-Hoeksema, 2009), the majority of our sample were non-depressed/non-dysphoric individuals, who are relatively skilled at mood repair (Joorman & Siemer, 2004). Indeed, we found evidence consistent with this account by re-analysing our data based on participants’ CES-D scores. Across both studies, rumination

decreased moods in every mood condition for dysphorics, but decreased moods only in the neutral and positive conditions for non-dysphorics. Again, the current studies were neither designed nor powered to formally test the moderating role of sub-clinical depression, and so replication with a clinical sample would be an obvious next step in this research programme. Our goal in this paper is merely to provide basic research on the structure of normal cognitive–emotional interactions, with the hope that our findings will inform the judgments of professional clinicians in the field.

Lack of support for the salience hypothesis might seem counterintuitive in the context of our mood manipulation. That hypothesis is based on the assumption that rumination should exacerbate people’s moods by increasing the availability of those emotions and congruent thoughts. Our mood manipulation relies on precisely this principle, encouraging participants to make salient prior events and feelings in order to influence their current emotional state. Why did an initial focus on valenced thoughts (during the mood manipulation) have a strong impact on mood, while a continued focus on those thoughts (during the rumination manipulation) failed to make an additional impact?

The difference, we believe, illustrates the affective risk involved when the focus of attention is on the self. Many theories of the self highlight the potential discomfort associated with self-awareness and introspection (for review see Carver & Scheier, 1990; Duval & Wicklund, 1972; Fejfar & Hoyle, 2000; Higgins, 1987; Mor & Winquist, 2002). Although these theories differ in their assumptions and focus, a common theme is that self-awareness, whether intentional or unconscious (e.g., being in the presence of a mirror), highlights discrepancies between current and desired states and goals. Higgins’ (1987) self-discrepancy theory, for example, explicitly relates these discrepancies to particular types of negative emotions, with failures to meet one’s perceived responsibilities, and failures to fulfil one’s personal aspirations, associated with high- and low-arousal negative affect, respectively. Even though in some theories self-awareness has the potential to be positive (Carver & Scheier, 1990), it is clear that focusing on the self is an emotionally risky endeavour at the best of times.

These two mechanisms—salience and self-focus—are of course not mutually exclusive, and indeed co-vary in practice. As noted, rumination is a common feature of clinical (and probably sub-clinical) depression (Thomsen, 2006), such that chronically sad individuals may be more likely to ruminate (Kuehner & Weber, 1999). Unfortunately, these individuals may also be more likely to have chronic discrepancies in their self-concepts (Roelofs et al., 2007)—more areas in which they are not living up to their ideals and responsibilities—and therefore to suffer the effects of self-awareness more acutely. Indeed, in the follow-up analysis cited above, we found that rumination had a bigger negative effect on dysphoric

people than on non-dysphoric people. That finding is consistent with the claim that dysphorics experience a greater discrepancy between their ideal and actual selves, and fits with the self-focus account of rumination's effects. Thus, a combination of negative thoughts, and the tendency to self-analyse that may co-occur with them, may make one uniquely vulnerable to depression. However, our data suggest that, at least at sub-clinical levels in the laboratory, the two exert independent effects, and in theory could be the target of independent interventions.

Manuscript received January 2017

Revised manuscript accepted September 2017

First published online November 2017

## REFERENCES

- Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice*, 10(2), 125–143.
- Carver, C. S., & Scheier, M. F. (1990). Origins and functions of positive and negative affect: A control-process view. *Psychological Review*, 97, 19–35. <https://doi.org/10.1037/0033-295X.97.1.19>
- Ciesla, J. A., & Roberts, J. E. (2007). Rumination, negative cognition, and their interactive effects on depressed mood. *Emotion*, 7, 555–565. <https://doi.org/10.1037/1528-3542.7.3.555>
- Clark, D. M., & Teasdale, J. D. (1985). Constraints on the effects of mood on memory. *Journal of Personality and Social Psychology*, 48, 1595–1608. <https://doi.org/10.1037/0022-3514.48.6.1595>
- Davis, C. G., Nolen-Hoeksema, S., & Larson, J. (1998). Making sense of loss and benefiting from the experience: Two construals of meaning. *Journal of Personality and Social Psychology*, 75, 561–574. <https://doi.org/10.1037/0022-3514.75.2.561>
- Duval, S., & Wicklund, R. A. (1972). *A theory of objective self awareness*. New York: Academic Press.
- Fejfar, M. C., & Hoyle, R. H. (2000). Effect of private self-awareness on negative affect and self-referent attribution: A quantitative review. *Personality and Social Psychology Review*, 4, 132–142. [https://doi.org/10.1207/S15327957PSPR0402\\_02](https://doi.org/10.1207/S15327957PSPR0402_02)
- Gruber, J., Harvey, A. G., & Johnson, S. (2009). Reflective and ruminative processing of positive emotional memories in bipolar disorder and healthy controls. *Behaviour Research and Therapy*, 47, 697–704. <https://doi.org/10.1016/j.brat.2009.05.005>
- Halberstadt, J. B., & Niedenthal, P. M. (1997). Emotional state and the use of stimulus dimensions in judgment. *Journal of Personality and Social Psychology*, 72, 1017–1033. <https://doi.org/10.1037/0022-3514.72.5.1017>
- Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, 94, 319–340. <https://doi.org/10.1037/0033-295X.94.3.319>
- Higgins, E. T., Bond, R. N., Klein, R., & Strauman, T. (1986). Self-discrepancies and emotional vulnerability: How magnitude, accessibility, and type of discrepancy influence affect. *Journal of Personality and Social Psychology*, 51, 5–15. <https://doi.org/10.1037/0022-3514.51.1.5>
- Huffziger, S., & Kuehner, C. (2009). Rumination, distraction, and mindful self-focus in depressed patients. *Behaviour Research and Therapy*, 47(3), 224–230.
- Joorman, J., & Siemer, M. (2004). Memory accessibility, mood regulation, and dysphoria: Difficulties in repairing sad mood with happy memories? *Journal of Abnormal Psychology*, 113, 179–188. <https://doi.org/10.1037/0021-843X.113.2.179>
- Just, N., & Alloy, L. B. (1997). The response styles theory of depression: Tests and an extension of the theory. *Journal of Abnormal Psychology*, 106, 221–229. <https://doi.org/10.1037/0021-843X.106.2.221>
- Kuehner, C., & Weber, I. (1999). Responses to depression in unipolar depressed patients: An investigation of Nolen-Hoeksema's response styles theory. *Psychological Medicine*, 29, 1323–1333. <https://doi.org/10.1017/S0033291799001282>
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the depression anxiety stress scales (DASS) with the Beck depression and anxiety inventories. *Behaviour Research and Therapy*, 33, 335–343. [https://doi.org/10.1016/0005-7967\(94\)00075-U](https://doi.org/10.1016/0005-7967(94)00075-U)
- Mor, N., & Winquist, J. (2002). Self-focused attention and negative affect: A meta-analysis. *Psychological Bulletin*, 128, 638–662. <https://doi.org/10.1037/0033-2909.128.4.638>
- Morrow, J., & Nolen-Hoeksema, S. (1990). Effects of responses to depression on the remediation of depressive affect. *Journal of Personality and Social Psychology*, 58, 519–527. <https://doi.org/10.1037/0022-3514.58.3.519>
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*, 100, 569–582. <https://doi.org/10.1037/0021-843X.100.4.569>
- Nolen-Hoeksema, S., & Morrow, J. (1993). Effects of rumination and distraction on naturally occurring depressed mood. *Cognition & Emotion*, 7, 561–570. <https://doi.org/10.1080/02699939308409206>
- Nolen-Hoeksema, S., Morrow, J., & Fredrickson, B. L. (1993). Response styles and the duration of episodes of depressed mood. *Journal of Abnormal Psychology*, 102, 20–28. <https://doi.org/10.1037/0021-843X.102.1.20>
- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science*, 3, 400–424. <https://doi.org/10.1111/j.1745-6924.2008.00088.x>
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401. <https://doi.org/10.1177/014662167700100306>
- Reynolds, W. M. (1982). Development of reliable and valid short forms of the Marlowe-Crowne social desirability scale. *Journal of Clinical Psychology*, 38, 119–125. [https://doi.org/10.1002/1097-4679\(198201\)38:1<119::AID-JCLP2270380118>3.0.CO;2-I](https://doi.org/10.1002/1097-4679(198201)38:1<119::AID-JCLP2270380118>3.0.CO;2-I)
- Roelofs, J., Papageorgiou, C., Gerber, R. D., Huibers, M., Peeters, F., & Arntz, A. (2007). On the links between self-discrepancies, rumination, metacognitions, and symptoms of depression in undergraduates. *Behaviour Research*

- and Therapy*, 45, 1295–1305. <https://doi.org/10.1016/j.brat.2006.10.005>
- Roger, D., & Najarian, B. (1998). The relationship between emotional rumination and cortisol secretion under stress. *Personality and Individual Differences*, 24, 531–538. [https://doi.org/10.1016/S0191-8869\(97\)00204-3](https://doi.org/10.1016/S0191-8869(97)00204-3)
- Rude, S. S., Little Maestas, K., & Neff, K. (2007). Paying attention to distress: What's wrong with rumination? *Cognition and Emotion*, 21, 843–864. <https://doi.org/10.1080/02699930601056732>
- Rusting, C. L., & Nolen-Hoeksema, S. (1998). Regulating responses to anger: Effects of rumination and distraction on angry mood. *Journal of Personality and Social Psychology*, 74, 790–803. <https://doi.org/10.1037/0022-3514.74.3.790>
- Spasojević, J., & Alloy, L. B. (2001). Rumination as a common mechanism relating depressive risk factors to depression. *Emotion*, 1, 25–37. <https://doi.org/10.1037/1528-3542.1.1.25>
- Thomsen, D. (2006). The association between rumination and negative affect: A review. *Cognition and Emotion*, 20, 1216–1235. <https://doi.org/10.1080/02699930500473533>
- Treynor, W., Gonzalez, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research*, 27, 247–259. <https://doi.org/10.1023/A:1023910315561>
- Watkins, E., Scott, J., Wingrove, J., Rimes, K., Bathurst, N., Steiner, H., ... Malliaris, Y. (2007). Rumination-focused cognitive behaviour therapy for residual depression: A case series. *Behaviour Research and Therapy*, 45(9), 2144–2154.
- Watkins, E. R. (2009). Depressive rumination: Investigating mechanisms to improve cognitive behavioural treatments. *Cognitive Behaviour Therapy*, 38(S1), 8–14.
- Wisco, B. E., & Nolen-Hoeksema, S. (2009). The interaction of mood and rumination in depression: Effects on mood maintenance and mood-congruent autobiographical memory. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 27, 144–159. <https://doi.org/10.1007/s10942-009-0096-y>