

## Effects of Self-Focused Rumination on Negative Thinking and Interpersonal Problem Solving

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Hypotheses about the effects of self-focused rumination on interpretations of events and interpersonal problem solving were tested in 3 studies with dysphoric and nondysphoric participants. Study 1 supported the hypothesis that dysphoric participants induced to ruminatively self-focus on their feelings and personal characteristics would endorse more negative, biased interpretations of hypothetical situations than dysphoric participants induced to distract themselves from their mood, or nondysphoric participants. Study 2 showed that dysphoric participants who ruminated were more pessimistic about positive events in their future than the other 3 groups. Study 3 showed that dysphoric ruminating participants generated less effective solutions to interpersonal problems than the other 3 groups. In Studies 1 and 3, dysphoric ruminating participants also offered the most pessimistic explanations for interpersonal problems and hypothetical negative events. In all 3 studies, dysphoric participants who distracted were as optimistic and effective in solving problems as nondysphoric participants.

Several studies have shown that self-focused attention or rumination is associated with more severe and long-lasting periods of depressed mood (for reviews, see Carver & Scheier, 1990; Ingram, 1990; Nolen-Hoeksema, 1991; Pyszczynski & Greenberg, 1987). Self-focused attention and rumination have been conceptualized and operationalized in a variety of ways. In several laboratory studies, self-focused attention has been induced by placing participants in front of a mirror or having them write essays including the words *I*, *me*, *mirror*, and *alone* (e.g., Barden, Garber, Leiman, Ford, & Masters, 1985; Gibbons et al., 1985; Pyszczynski, Holt, & Greenberg, 1987). In other studies investigating the effects of a ruminative style of coping with depressed mood, rumination has been induced by having participants focus on their current physical and emotional feeling state, their personality, and their goals (e.g., Lyubomirsky & Nolen-Hoeksema, 1993; Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema & Morrow, 1993). These various studies have found that self-focused attention and rumination increase or maintain depressed mood in dysphoric or clinically depressed participants (Barden et al., 1985; Fennell & Teasdale, 1984; Gibbons et al., 1985; Lyubomirsky & Nolen-Hoeksema, 1993; Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema & Morrow, 1993). In nondysphoric par-

ticipants, however, self-focused attention or rumination does not induce depressed mood.

Some correlational studies have measured self-focused attention with the Private Self-Consciousness Scale (Fenigstein, Scheier, & Buss, 1975), which assesses the tendency to analyze one's personality and focus on one's internal states, regardless of one's current mood. People who score high on private self-consciousness also tend to score high on self-report measures of dysphoria (Ingram, Lumry, Cruet, & Sieber, 1987; Ingram & Smith, 1984; Larsen & Cowan, 1988; Smith & Greenberg, 1981; Smith, Ingram, & Roth, 1985). Other correlational studies have used the Response Styles Questionnaire (Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema, Morrow, & Fredrickson, 1993), a measure of people's tendency to cope with dysphoric mood by focusing on this mood and ruminating about its causes and consequences. People who evidence a ruminative style of coping tend to have longer periods of dysphoria, even when their initial levels of dysphoric mood are statistically taken into account (Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema et al., 1993; see also Wood, Saltzberg, Neale, Stone, & Rachmiel, 1990).

The tendency to engage in self-focused, ruminative responses to depressed mood appears to be a stable coping style. In a sample of 253 adults, scores on the ruminative coping scale of the Response Styles Questionnaire correlated .80 over a 5-month interval (Nolen-Hoeksema, Parker, & Larson, 1994). Nolen-Hoeksema (1991) argued that the ruminative coping style can lead the mild dysphoria that most people experience occasionally in response to stressful events to grow into more serious and prolonged depression. In support of this argument, Nolen-Hoeksema et al. (1994) found that recently bereaved adults who were only mildly dysphoric shortly after the death of their loved one became increasingly more depressed and had longer periods of depressed mood if they had a ruminative coping style. Similar results were found in studies of people's dysphoric reactions to an

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earthquake (Nolen-Hoeksema & Morrow, 1991) and to everyday stressful events (Nolen-Hoeksema et al., 1993).

### Self-Focused Rumination, Thinking, and Problem Solving

Theorists interested in self-focused attention and depression have argued that self-focusing or rumination can maintain or exacerbate dysphoria by enhancing the effects of depressed mood on thinking and by interfering with good problem solving (Carver & Scheier, 1990; Ingram & Smith, 1984; Lewinsohn, Hoberman, Teri, & Hautzinger, 1985; Musson & Alloy, 1988; Nolen-Hoeksema, 1991; Pyszczynski & Greenberg, 1987; Smith & Greenberg, 1981; Strack, Blaney, Ganellen, & Coyne, 1985; Teasdale, 1983). According to semantic network theory, a negative mood activates a network of negative memories, enhancing accessibility and probability of retrieval of these memories, as well as the retrieval of negative beliefs and schemas about the self and the world (Bower, 1981; Clark & Teasdale, 1982; Forgas & Bower, 1987; Teasdale & Fogarty, 1979). Self-focus or rumination should enhance the effects of dysphoria on negative thinking because the individual's attention is drawn to his or her negative mood and the activated negative thoughts. For example, when focusing on the causes of one's depressed mood, one may remember recent trivial arguments with one's spouse and conclude that one's marriage is in trouble, or one may blame oneself for marital problems, believing that the situation is hopeless and enduring. Similarly, when considering the possible consequences of one's dysphoria, one may selectively remember occasional situations in which the dysphoric mood had interfered with one's work or social life and conclude that "I am ruining my life." In other words, it is the depressed mood that activates negative thoughts, but self-focused rumination brings these thoughts to the attention of the person and allows these thoughts to affect the person's judgments and interpretations of his or her current situation. In turn, these negative judgments and interpretations exacerbate depressed mood, creating the vicious cycle between depressed mood and thinking described by Teasdale (1983) and impairing the individual's ability to come up with good solutions to his or her problems. Thus, even though people may engage in self-focused, ruminative coping as a way of trying to understand life's problems (Lyubomirsky & Nolen-Hoeksema, 1993), doing so in the context of a dysphoric mood can actually interfere with clear thinking and problem solving. In contrast, focusing on the self when one is not in a depressed mood should not lead to negative thinking because there is no dysphoria present to activate negative thoughts.

Existing studies have provided mixed support for the claim that self-focusing can enhance negative thinking in dysphoric participants (see reviews by Ingram, 1990, 1991). Two studies conducted by Pyszczynski, Greenberg, and colleagues have shown that self-focusing inductions lead dysphoric participants to have more pessimistic expectancies for future events (Pyszczynski et al., 1987) and to remember more negative events from their past (Pyszczynski, Hamilton, Herring, & Greenberg, 1989) than external focusing manipulations. In the self-focusing inductions in these studies, participants wrote stories using the words *I*, *my*, *mirror*, and *alone*. However, Gibbons

and his colleagues (1985) found no effects of another self-focusing induction, placing participants in front of a mirror, on the attributions or ratings of personal problems of psychiatric patients. In addition, Smith et al. (1985) found no relationship between private self-consciousness and participants' tendencies to make negative internal attributions.

Even fewer studies have examined whether self-focusing can impair the dysphoric person's ability to solve the type of problems that may have led to his or her dysphoria. Some studies have investigated the effects of self-focusing manipulations on dysphoric participants' ability to solve cognitive problems, such as anagrams (Brockner, 1979; Brockner & Hulton, 1978; Strack et al., 1985; see also Kuhl, 1981). These studies indicate that the performance of dysphoric participants on such tasks is worse when they are induced to self-focus than when they are encouraged to focus on the task at hand. Yet we question whether the ability to solve cognitive tasks such as anagrams is related to the ability to think of good solutions to the types of problems that are frequently associated with dysphoria, such as complex interpersonal problems.

Thus, there is substantial evidence that self-focused attention or rumination can enhance or maintain dysphoria. But claims that ruminative self-focus enhances negative thinking and leads to poor interpersonal problem solving have not been extensively studied.

### The Current Studies

In the studies reported here, we directly tested hypotheses from our own theory of rumination and depression (Nolen-Hoeksema, 1991) and from other self-focusing theories (e.g., Carver & Scheier, 1990; Pyszczynski & Greenberg, 1987) that dysphoric people who engage in self-focused rumination would show more negative thinking and poorer interpersonal problem solving than dysphoric people who distract themselves from their moods. In contrast, we predicted that nondysphoric participants would show no effects of rumination or distraction on their thinking and problem solving because rumination should be associated with pessimistic thinking and impaired problem solving only in the presence of a dysphoric mood.

We operationalized negative thinking in two ways. First, Beck (1967, 1987) argued that depressed people are more likely than nondepressed people to choose negative and distorted interpretations of events: They minimize their successes and maximize or overgeneralize from their failures, and they make arbitrary negative inferences and selectively abstract the negative aspects of events. In turn, these negative, distorted patterns of thinking enhance and maintain depression. Krantz and Hammen (1979) developed the Cognitive Biases Questionnaire (CBQ) to assess participants' tendencies to select the negative, distorted interpretations of hypothetical events described by Beck. Several studies using the CBQ have found that depressed people are more likely than nondepressed people to choose negative and distorted interpretations of events (Frost & MacInnis, 1983; Hammen & Krantz, 1976; Krantz & Hammen, 1979; Norman, Miller, & Klee, 1983). Moreover, Krantz and Hammen (1979) found that clinically depressed individuals who endorsed more depressed-distorted interpretations of events on the CBQ before an intervention were more likely to remain de-

pressed after treatment than those who had endorsed fewer distortions (see also Lewinsohn, Steinmetz, Larsen, & Franklin, 1981). In Study 1, we used the CBQ to assess the effects of self-focused rumination on dysphoric and nondysphoric participants' tendencies to select negative, distorted interpretations of events.

Second, the reformulated learned helplessness theory (Abramson, Metalsky, & Alloy, 1989; Abramson, Seligman, & Teasdale, 1978) argues that the tendency to attribute bad events to causes that are internal, stable, and global and to have pessimistic expectations for the future leads to dysphoric reactions to negative events. Several studies have found a relationship between high levels of dysphoria or depression and the tendency to make internal, stable, global attributions for negative events and the tendency to have pessimistic expectations for one's future (for reviews, see Peterson & Seligman, 1984; Sweeney, Anderson, & Bailey, 1986). In addition, some studies have found that participants with such pessimistic attributions and expectancies are more likely to become depressed or to remain depressed over time, even after their initial levels of depressed mood have been statistically controlled (Nolen-Hoeksema, Girgus, & Seligman, 1986, 1992). In Studies 1 and 3, we assessed the effects of self-focused rumination on the tendency of dysphoric and nondysphoric participants to make internal, stable, and global attributions for hypothetical negative events. In addition, in Study 2, we assessed the effects of self-focused rumination on the expectations of dysphoric and nondysphoric participants for positive and negative events in their futures.

In Study 3, we also assessed the effects of ruminative self-focus on the ability of dysphoric and nondysphoric participants to generate good solutions to common interpersonal problems. To measure participants' problem-solving abilities, we used an adaptation of the Means-Ends Problem-Solving Procedure (MEPS; Platt & Spivack, 1975), which was designed as a measure of interpersonal (or "social") problem solving. Participants were presented with hypothetical interpersonal problems (e.g., a good friend becomes angry with you) and were asked to generate solutions to these problems. Previous studies using this and similar measures have found that dysphoric participants generate fewer and poorer solutions to such problems than nondysphoric participants (Gotlib & Asarnow, 1979; Marx, Williams, & Claridge, 1992; Nezu, Nezu, & Perri, 1989; Nezu & Ronan, 1988; Zemore & Dell, 1983). These studies have not investigated the effects of self-focused attention or, more specifically, ruminative responses to dysphoria on dysphoric participants' attempts at solving interpersonal problems.

Our rumination induction was based on Nolen-Hoeksema's (1991) definition of ruminative responses to dysphoria. Participants were asked to spend 8 min focusing on their current physical and emotional state and their personal characteristics. We believe this induction has advantages over other self-focusing inductions. First, it parallels our theoretical definition of rumination. In contrast, the other common self-focus inductions, such as placing participants before a mirror or having them write an essay with the words *I, me, mirror, and alone*, do not parallel any of the other self-focusing theories, which describe self-focusing as focusing on discrepancies between one's goals and current state (Carver & Scheier, 1990; Pyszczynski & Greenberg, 1987), as focusing on one's failures (Pyszczynski & Greenberg, 1987), or as chronically

analyzing one's personality (Smith & Greenberg, 1981). Second, our rumination induction asks participants to focus on their personalities and current feeling states, but it does not require participants to focus specifically on negative aspects of themselves. As such, this manipulation is not a negative mood induction. Indeed, previous studies have already found that this rumination manipulation has no effect on the moods of nondysphoric participants (Lyubomirsky & Nolen-Hoeksema, 1993; Nolen-Hoeksema & Morrow, 1993). But the rumination induction reliably maintains or exacerbates the dysphoria of already-dysphoric participants, as we would predict.

## Study 1

### Overview

Dysphoric and nondysphoric participants engaged in either a ruminative or distracting task and then completed the forced-choice CBQ to assess their tendencies to choose negative, distorted interpretations of events. Subsequently, participants were allowed to describe their thoughts and feelings about the hypothetical events presented on the CBQ in an open-ended response task. Their responses were rated by judges unaware of dysphoria status and manipulation condition for the negativity and distortion in their interpretations of the events and for the internality, stability, and globality of the attributions offered for the events. We predicted that, relative to the dysphoric participants who distracted or either of the nondysphoric groups, the dysphoric participants who ruminated would choose more negative-distorted responses to the forced-choice CBQ and would give more negative-distorted responses and pessimistic attributions in their open-ended responses to the CBQ. In contrast, we predicted no differences among the dysphoric distractors, the nondysphoric ruminators, and the nondysphoric distractors. Rosenthal (Rosenthal & Rosnow, 1985; see also Rosnow & Rosenthal, 1989) has argued that the appropriate way to test such a priori predictions is by planned contrasts rather than by two-way analyses of variance (ANOVAs). Thus, analyses using planned contrasts comparing the dysphoric-ruminative group with the other three groups were performed on all of the dependent measures of interest. In addition, to support our claim that dysphoric participants made to distract would differ from dysphoric participants made to ruminate but that they would not differ from the two nondysphoric groups, we conducted planned pairwise comparisons between the dysphoric-distracting group and each of the other three groups.

### Method

#### Participants

Sixty-nine Stanford University introductory psychology students (35 women and 34 men) received course credit for their participation in this study. Potential participants completed the 13-item short form of the Beck Depression Inventory (BDI-SF; Beck & Beck, 1972) as part of a larger packet of unrelated questionnaires administered at the beginning of the quarter. On the basis of past recommendations (Beck & Beamesderfer, 1974), we recruited students with BDI-SF scores above 7 for the moderately dysphoric group and students with BDI-SF scores below 3 for the nondysphoric group. Because the BDI-SF has demonstrated high test-retest stability within 2 weeks among college undergraduates

(Pearson's  $r = .90$ ; Lightfoot & Oliver, 1985), 33 dysphoric (20 women and 13 men) and 36 nondysphoric (15 women and 21 men) students participated within 2 weeks after completing the BDI-SF. Mean BDI-SF scores were 9.87 ( $SD = 3.72$ ) for dysphoric students and 0.94 ( $SD = 0.94$ ) for nondysphoric students.

## Materials

**Mood questionnaires.** Students completed two packets of mood questionnaires during the experiment. Each packet contained a questionnaire that asked students to rate their present state, including levels of sadness and depression, on 9-point Likert scales ranging from *not at all* (1) to *extremely* (9). Mood questionnaires were administered at the beginning of the experiment and immediately after the response task manipulation (i.e., induction of rumination or distraction). Ratings of sadness and depression were averaged to arrive at a single measure of depressed mood at each assessment. The mood questionnaires contained a number of filler scales (e.g., measuring levels of bashfulness, curiosity, creativity, and recklessness) to help disguise the study's focus on mood. Likert scales, instead of the BDI-SF, were used to assess mood during the experimental hour because we believed that the BDI-SF's obvious focus on depressive symptoms would be likely to reveal the study's hypotheses. A number of previous studies have used Likert scales as mood measures (e.g., Pittman et al., 1990; Wenzlaff, Wegner, & Klein, 1991). As evidence for their validity, in all three of the studies reported here, our Likert scale measures of mood at the beginning of the experimental hour were found to be highly correlated (Pearson's  $r$ s ranging from .72 to .88) with students' preexperimental BDI-SF scores. To further obscure the intent of the study, we included several filler tasks, such as pencil-and-paper inventories about imagining colors and recalling one's dreams, in the packets of mood scales.

**Response manipulation tasks.** The response manipulation tasks were designed to influence the content of students' thoughts by requiring them to focus their attention and "think about" a series of 45 items (adapted from Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema & Morrow, 1993). Following Nolen-Hoeksema's (1991) definition of ruminative responses, the rumination condition required students to focus their attention on thoughts that were emotion focused, symptom focused, and self-focused, although students were not told specifically to think about negative emotions or negative personal attributes. For example, they were asked to think about "your current level of energy," "the physical sensations in your body," "what your feelings might mean," "the kind of person you are," and "why you react the way you do." In contrast, students in the distraction condition focused their attention on thoughts that were focused externally and not related to symptoms, emotions, or the self. For example, they were asked to think about "a boat slowly crossing the Atlantic," "the expression on the face of the *Mona Lisa*," and "a double-decker bus driving down the street." The items in the rumination and distraction conditions were rated as equally neutral by nondysphoric judges. In each condition, students spent exactly 8 min focusing on the items.

**Cognitive Bias Questionnaire.** Depressed and biased interpretations of situations were measured by means of a slightly modified version of Krantz and Hammen's (1979) CBQ. Students were presented with six hypothetical problematic situations common to college students (order was counterbalanced across students) and were asked to imagine themselves experiencing these situations. Three of the stories had interpersonal themes and three had achievement themes. Following the description of each situation were four multiple-choice questions<sup>1</sup> about students' possible thoughts and feelings as they imagined themselves in the situation. Each question had four response options, constructed to capture two crossed dimensions: depressed versus nondepressed and distorted versus nondistorted. The depressed–nondepressed dimension denoted the presence or absence of dysphoric or sad

affect. The distorted–nondistorted dimension indicated the presence or absence of inferences or interpretations that were unwarranted in light of the available information. On the basis of feedback received from participants in pilot tests of the original CBQ, the wording of the stories, the questions, and the response options was slightly modified to reflect the language of today's college students. We also rewrote the descriptions of the situations using the second person pronoun instead of proper names.

For example, in one of the stories, participants were asked to imagine that they are encouraged by friends to run for the presidency of an organization, but they eventually lose the election. The first item and the four response options were as follows:

When you first hear you have lost, you immediately:

1. Feel bad and imagine I've lost by a landslide. (depressed–distorted)
2. Shrug it off as unimportant. (nondepressed–distorted)
3. Feel sad and wonder what the total counts were. (depressed–nondistorted)
4. Shrug it off, feeling I've tried as hard as I could. (nondepressed–nondistorted)

Two measures of depressed, biased interpretations of situations were used on recommendation of Hammen and Krantz (1976). A depressed–distorted score was computed by totaling the number of depressed–distorted responses (out of 23 possible response options) students selected; a nondepressed–nondistorted score was computed by totaling the number of nondepressed–nondistorted responses (again, out of 23 possible responses) students selected. Following previous research using the CBQ (e.g., Krantz & Hammen, 1979; Norman et al., 1983), we do not report depressed–nondistorted and nondepressed–distorted scores because of degrees of freedom and interpretability limitations.

The CBQ has demonstrated satisfactory internal consistency and test–retest reliability (Krantz & Hammen, 1979). As evidence for its validity, significant correlations have been reported between depressed–distorted scores and various measures of depression, such as the Beck Depression Inventory (Frost & MacInnis, 1983; Krantz & Hammen, 1979; Norman et al., 1983), intensity of depressive symptoms (Blaney, Behar, & Head, 1980), the depression scale of the Multiple Adjective Affect Checklist (Zuckerman & Lubin, 1965), and depressive speech tone (Frost & MacInnis, 1983). In a pilot study using our modified version of the CBQ (Lyubomirsky & Nolen-Hoeksema, 1992), the mean CBQ scores of dysphoric and nondysphoric participants were very similar to those of depressed and nondepressed college students in previous studies (e.g., Krantz & Hammen, 1979; Norman et al., 1983), and the differences between the dysphoric and nondysphoric participants' responses were statistically significant. Thus, the slight modifications we made to the CBQ did not substantially change participants' pattern of responses from that found with the original version of the questionnaire.

**Cognitive Bias Questionnaire: Open-ended version.** The forced-choice format of the CBQ had two limitations. First, it constrained participants' selection of possible responses to the situations presented. Second, because depressed–distorted responses are fairly extreme, previous studies have found that they are infrequently endorsed (typically fewer than 6 of 23 responses by depressed participants; see Hammen & Krantz, 1985). Thus, we were concerned that the forced-choice CBQ might not be sensitive enough to detect the differences between the groups that we hypothesized. We thus gave our students an opportunity to describe their thoughts and feelings in their own words. After they

<sup>1</sup> One story was followed by only three questions, as in the original CBQ.

had completed the CBQ (and a filler task), students were presented with the abridged versions of the same six situations and again asked to imagine themselves experiencing these situations. They were then instructed to "write down the first thought and/or feeling that comes to mind in reaction to the situation, regardless of whether it is similar to or different from the response you chose previously."

Two independent raters unaware of students' dysphoria status and manipulation condition scored each student's responses to the six situations. Each response was rated for dysphoric or sad tone on a 7-point Likert scale ranging from *happy* (1) to *sad* (7). Each response was also rated for amount of bias or distortion on a 7-point Likert scale ranging from *nondistorted* (1) to *distorted* (7). The raters were extensively trained in recognizing whether a given response was characterized by one or more of Beck's logical errors. They were instructed to rate responses as more distorted if they contained more than one inference or conclusion not warranted by the available information or if the interpretations reflected in the responses were especially strong or explicit. Agreement between the two raters was excellent on both of the just-mentioned measures. The intraclass correlation coefficients for the six situations ranged from .85 to .94 ( $M = .92$ ) for the dysphoria dimension and from .92 to .96 ( $M = .94$ ) for the distortion dimension.

Two of the six situations in the CBQ described clearly negative events or outcomes (i.e., you lose an election and a person you are attracted to snubs you at lunch). Students' responses to these situations invariably contained causal explanations for the negative events. These explanations were coded on 7-point Likert scales on the basis of three dimensions described by Abramson et al. (1978) in their reformulated theory of learned helplessness: (a) how stable the cause is across time (1 = *cause is transient*, 7 = *cause persists*), (b) how global the cause is across domains (1 = *cause is limited in its effects*, 7 = *cause affects many domains and outcomes*), and (c) how internal the cause is to the person (1 = *cause implicates something characteristic about the situation*, 7 = *cause implicates something characteristic about the person*). All responses to the two negative situations contained easily codable attributions. Raters did not code students' responses to the other four situations because these situations did not contain unambiguously negative events. Again, the agreement between the two raters was very good. The intraclass coefficients for the two situations that contained negative events were .84 and .88 for the stability ratings ( $M = .86$ ), .81 and .86 for the globality ratings ( $M = .83$ ), and .88 and .93 for the internality ratings ( $M = .87$ ).

### Procedure

All students participated individually. The experimenter was unaware of students' dysphoria status and manipulation condition. An elaborate cover story was used to minimize possible demand characteristics. At the beginning of the experiment, students were told that they would be participating in a series of short, independent studies investigating "processes of imagination, dreaming, levels of consciousness, and cognition in general." This cover story was bolstered by a number of neutral filler tasks embedded among the questionnaire packets that students completed throughout the experiment. Half of these filler tasks were distracting (e.g., mentally rotating abstract figures), and half involved self-analysis (e.g., reporting on one's self-insight). In addition, we used Likert scale measures of mood rather than the BDI-SF because these measures better fit our cover story and helped divert students' attention away from the study's actual focus on mood. Students' responses on a debriefing questionnaire and their comments during oral debriefing indicated that the cover story was successful. No student guessed the purpose of the study or the link between the response manipulations and the CBQ.

After describing the cover story, the experimenter gave students the first packet of questionnaires, which contained baseline measures of

depressed mood, and left the laboratory room. After students had completed the first packet, the experimenter reentered the laboratory room and introduced the response manipulation task. This task was described as an imagination task requiring students "to focus [their] mind on a series of ideas and thoughts" and to "use [their] ability to visualize and concentrate." Students were told to spend exactly 8 min on this task. As a manipulation check, students were asked, in a debriefing questionnaire administered at the end of the study, to recall the instructions for the task and to describe exactly what they did during the allotted 8 min. Students' responses indicated that they correctly understood the instructions and were able to focus on the items as requested (and to do so for the full 8 min). After the allotted time, the experimenter returned and asked students to complete the next packet of questionnaires, which contained the second set of mood measures as well as several filler tasks.

During the next phase, the experimenter administered the CBQ. Students were told that they would be presented with six scenarios, each describing a particular situation in which they might find themselves. They were then asked to imagine as vividly as they could what they would think and feel if they were experiencing the situation described and to respond to several multiple-choice questions about each situation. After they had answered all of the forced-choice questions on the CBQ, students were asked to do a filler task and then to respond to the open-ended version of the CBQ. The experimenter administered to students the abridged versions of the same six situations and provided the following explanation:

Previously, you read descriptions of six situations and responded to questions about the thoughts and feelings that you would have if you were experiencing those situations. However, you were forced to choose between four responses that may not have *exactly* matched what you were thinking and feeling. This time we would like to give you an opportunity to describe *in your own words* what your real thoughts and feelings would be if you were experiencing those situations.

After completing this task, students filled out a final packet of questionnaires that included several filler measures and a debriefing questionnaire. The experimenter then returned and thoroughly debriefed each student. The entire study lasted approximately 1 hr.

## Results

### Sex Differences

All analyses were initially performed with sex of student as a between-subjects variable. Only one significant main effect of sex was found. At the beginning of the experiment, women reported significantly greater dysphoria than men,  $t(64) = -2.37$ ,  $p < .03$ . Mean dysphoria ratings were 3.77 ( $SD = 2.20$ ) for women and 2.65 ( $SD = 1.72$ ) for men. To assess whether this sex difference affected the results of analyses comparing the four groups of interest, we initially performed analyses on all of the dependent variables with sex of student as a third variable. Because there were no interactions between sex and depression status or response manipulation condition, all analyses reported were conducted by collapsing across sex of student.

### Mood Manipulation Check

At the beginning of the study, students in the dysphoric group reported greater dysphoria than students in the nondysphoric group. Group differences in baseline mood were assessed in a 2 (depression status)  $\times$  2 (response manipulation) ANOVA with

baseline dysphoria, measured by Likert scale ratings, as the dependent variable. As predicted, a main effect for dysphoria status indicated that dysphoric students had higher levels of dysphoria at the outset of the experiment ( $M = 4.15$ ,  $SD = 0.32$ ) than nondysphoric students ( $M = 2.38$ ,  $SD = 0.31$ ),  $F(1, 65) = 15.65$ ,  $p < .0001$ . There were no differences in baseline dysphoria between ruminative and distracting conditions,  $F(1, 65) = 0.15$ , *ns*, and the interaction between dysphoria status and response condition was not significant,  $F(1, 65) = 0.66$ , *ns*.

Previous studies using a similar paradigm (Lyubomirsky & Nolen-Hoeksema, 1993; Nolen-Hoeksema & Morrow, 1993) found that, after the response task manipulation, dysphoric participants who had ruminated reported greater dysphoria than the other three groups, whereas dysphoric participants who had distracted reported a level of dysphoria that was similar to that of the two nondysphoric groups. The results of a planned contrast bolstered the prediction that the dysphoric-ruminative group showed significantly greater dysphoria than the other three groups in the study,  $F(1, 65) = 14.93$ ,  $p < .0003$ . According to the results of planned pairwise comparisons, the dysphoric-distracting group reported significantly lower dysphoria than the dysphoric-ruminative group,  $F(1, 65) = 8.09$ ,  $p < .006$ , yet the dysphoric-distracting group did not differ in dysphoria from the nondysphoric-ruminative group or the nondysphoric-distracting group (both  $F_s < 1$ ). [In all three of the studies reported here, a 2 (dysphoria status)  $\times$  2 (response manipulation) ANOVA (with postmanipulation dysphoria as the dependent variable), an analysis of covariance (with baseline mood as the covariate), a repeated measures ANOVA, and Student's *t* tests on response change scores were conducted to further assess the effects of the response manipulation tasks on postmanipulation dysphoria. All of these analyses yielded results that were very similar to those of the planned contrasts and pairwise comparisons reported.] Mean levels of dysphoria after the response task manipulation were as follows: dysphoric-ruminative group, 4.81 ( $SD = 0.41$ ); dysphoric-distracting group, 3.21 ( $SD = 0.39$ ); nondysphoric-ruminative group, 2.87 ( $SD = 0.37$ ); and nondysphoric-distracting group, 3.00 ( $SD = 0.39$ ).

### Responses to the Cognitive Bias Questionnaire

*Forced-choice responses.* As expected, the results of planned contrasts showed that, in response to the forced-choice version of the CBQ, students in the dysphoric-ruminative group selected significantly more depressed-distorted responses,  $F(1, 65) = 23.98$ ,  $p < .0001$ , and significantly fewer nondepressed-nondistorted responses,  $F(1, 65) = 14.78$ ,  $p < .0003$ , than the other three groups (see Table 1). Results of pairwise comparisons suggested that dysphoric ruminators endorsed significantly more depressed-distorted responses,  $F(1, 65) = 13.73$ ,  $p < .0004$ , and significantly fewer nondepressed-nondistorted responses,  $F(1, 65) = 5.30$ ,  $p < .03$ , than dysphoric distractors, and dysphoric distractors did not significantly differ in their responses from nondysphoric ruminators or from nondysphoric distractors (all  $F_s < 3$ ).

*Open-ended responses: Dysphoria and distortion.* The results of planned contrasts comparing the dysphoric-ruminative group with the other three groups supported our prediction that

the open-ended responses of the dysphoric-ruminative group to the CBQ would be characterized by significantly greater sad or dysphoric affect,  $F(1, 65) = 10.70$ ,  $p < .002$ , and a significantly greater amount of distortion,  $F(1, 65) = 15.32$ ,  $p < .0002$ , than those of the other three groups (see Table 1). According to the results of pairwise comparisons, the responses of the dysphoric-ruminative group were marginally significantly sadder than those of the dysphoric-distracting group,  $F(1, 65) = 3.34$ ,  $p < .07$ . As predicted, the responses of the dysphoric-distracting group did not significantly differ in sadness from those of the nondysphoric-ruminative group and the nondysphoric-distracting group (both  $F_s < 2$ ). Pairwise comparisons also showed that the dysphoric-ruminative group generated significantly more distorted responses than the dysphoric-distracting group,  $F(1, 65) = 4.91$ ,  $p < .03$ , and that the dysphoric-distracting group did not significantly differ from the nondysphoric-ruminative group and the nondysphoric-distracting group in the amount of distortion exhibited in its responses (both  $F_s < 3$ ).

*Open-ended responses: Causal attributions.* Our prediction that dysphoric students made to ruminate would offer the most pessimistic attributions among the four groups was supported. The results of planned contrasts revealed that the causal explanations for negative events of the dysphoric-ruminative group were rated as significantly higher than the other three groups in stability,  $F(1, 65) = 8.93$ ,  $p < .004$ ; globality,  $F(1, 65) = 7.75$ ,  $p < .007$ ; and internality,  $F(1, 65) = 6.60$ ,  $p < .02$  (see Table 1). Pairwise comparisons further showed that the attributions of dysphoric students made to ruminate were rated as significantly more stable,  $F(1, 65) = 5.07$ ,  $p < .03$ ; more global,  $F(1, 65) = 6.73$ ,  $p < .01$ ; and more internal,  $F(1, 65) = 4.17$ ,  $p < .05$ , than those of dysphoric students made to distract. As predicted, the explanations for negative events offered by these dysphoric-distracting students did not significantly differ from those offered by nondysphoric-ruminating students or from those offered by nondysphoric-distracting students (all  $F_s < 1$ ).

### Discussion

As predicted, dysphoric students induced to ruminate subsequently endorsed more negative, biased interpretations of events on the forced-choice CBQ than dysphoric students who were first distracted from their mood or than either of the nondysphoric groups. When considering hypothetical events in a free-response format, dysphoric students who ruminated also interpreted the events in ways that were rated as more distorted and sad and offered attributions for the negative events that were rated as more pessimistic (more internal, stable, and global) than the attributions of the other students. In contrast, the dysphoric students who distracted were not significantly different from the nondysphoric groups in their endorsements of depressed-distorted interpretations of events or in the amount of pessimism exhibited in their explanations for negative events.

In Study 2, we further examined the effects of rumination and distraction on dysphoric and nondysphoric students' cognitions, this time focusing on students' expectations about their own futures. In a study investigating predictions of future events, Pyszczynski et al. (1987) found that dysphoric partici-

Table 1  
*Forced-Choice and Open-Ended Responses of the Four Groups to the Cognitive Biases Questionnaire: Study 1*

Response	Group			
	Dysphoric-ruminative ( <i>n</i> = 16)	Dysphoric-distracting ( <i>n</i> = 17)	Nondysphoric-ruminative ( <i>n</i> = 19)	Nondysphoric-distracting ( <i>n</i> = 17)
<b>Forced choice<sup>a</sup></b>				
Depressed-distorted				
<i>M</i>	5.06	2.18	1.58	2.06
<i>SD</i>	3.32	1.47	2.04	1.78
Nondepressed-nondistorted				
<i>M</i>	9.13	11.76	12.74	13.71
<i>SD</i>	3.70	2.97	3.21	3.27
<b>Dysphoria and distortion</b>				
Level of dysphoria				
<i>M</i>	4.79	4.42	4.18	4.13
<i>SD</i>	0.78	0.49	0.55	0.51
Amount of distortion				
<i>M</i>	3.24	2.51	2.04	1.99
<i>SD</i>	1.30	0.82	0.82	0.81
<b>Causal attributions<sup>b</sup></b>				
Stability				
<i>M</i>	3.69	2.68	2.75	2.34
<i>SD</i>	1.59	0.99	1.37	1.15
Globality				
<i>M</i>	3.42	2.32	2.49	2.56
<i>SD</i>	1.42	0.93	1.33	1.13
Internality				
<i>M</i>	4.58	3.44	3.38	3.40
<i>SD</i>	1.89	1.42	1.62	1.43

<sup>a</sup> Values indicate the number of responses (maximum = 23). <sup>b</sup> Higher scores indicate greater pessimism.

pants made to self-focus, in comparison with dysphoric participants made to focus their attention away from themselves, rated negative events as more likely to happen to themselves and positive events as more likely to happen to others. The events rated by participants in the Pyszczynski et al. study were hypothetical (e.g., having a mentally gifted child). In contrast, we chose to assess participants' predictions about the actual events and situations that they expected to experience in the future, which they were asked to generate themselves. According to the reformulated learned helplessness theory (Abramson et al., 1978), depressed people who have more pessimistic expectancies about their futures will experience helplessness and will be less able to recover from depression. We hypothesized that dysphoric students induced to ruminate would be more pessimistic about events happening to them in the future than dysphoric students who first distracted from their mood or nondysphoric students. Again, we also hypothesized that the dysphoric students who distracted and the two nondysphoric groups would be similarly optimistic about their futures.

## Study 2

### Method

#### Participants and Procedure

Seventy-three Stanford University introductory psychology students (41 women and 32 men) received course credit for their participation in this study. Potential participants completed the BDI-SF at the beginning of the quarter. On the basis of the classification procedure of the

previous study, 36 students (19 women and 17 men) were dysphoric ( $M = 9.69$ ,  $SD = 2.59$ ) and 37 students (19 women and 18 men) were nondysphoric ( $M = 0.91$ ,  $SD = 0.96$ ). Students participated within 2 weeks after filling out the BDI-SF. The procedure was identical to that used in Study 1, except that after the mood assessments and the response manipulation tasks, students completed a measure of expectancies for future events instead of completing the two versions of the CBQ.

#### Predictions About Future Events

Students were instructed to imagine that they have graduated from college and a year has passed since their graduation. They were then asked to write down what they thought would happen to them during this year. Their instructions were as follows:

What do you think will be the same and what do you think will be different about your life? Please be sure to include what will be going on with your career (e.g., work, school) and with your relationships (e.g., friends, boyfriends/girlfriends, family). In addition, please feel free to mention anything else that you think you will experience during this year, such as your health (physical or psychological), your leisure time (e.g., travel, sports), and your financial situation, as well as any problems that you think you will encounter.

After students had listed six such events or situations, they were asked to respond to two questions about each item on 7-point Likert scales: How likely do you think that this event or situation will really happen? (1 = *not at all likely*, 7 = *extremely likely*) and How happy would you be if this event or situation really happened? (1 = *not at all happy*, 7 = *extremely happy*).

## Results

Because there were no main effects or interactions with sex, all analyses were conducted by collapsing across sex of students. There were 18 students in the dysphoric-ruminative group, 18 in the dysphoric-distracting group, 18 in the nondysphoric-ruminative group, and 19 in the nondysphoric-distracting group.

### Mood Manipulation Check

As in Study 1, dysphoric students reported greater dysphoria at the outset of the experiment ( $M = 4.81$ ,  $SD = 1.66$ ) than nondysphoric students ( $M = 2.50$ ,  $SD = 1.11$ ),  $F(1, 69) = 48.94$ ,  $p < .0001$ . However, as expected, after the response task manipulation, dysphoric students instructed to ruminate reported significantly greater dysphoria than the other three groups in the study,  $F(1, 69) = 37.28$ ,  $p < .0001$ . The results of pairwise comparisons also showed that dysphoric students made to distract reported significantly less dysphoria than dysphoric students made to ruminate,  $F(1, 69) = 10.59$ ,  $p < .002$ . However, the dysphoric-distracting group showed significantly higher dysphoria than the nondysphoric-ruminative group,  $F(1, 69) = 8.36$ ,  $p < .006$ , and the nondysphoric-distracting group,  $F(1, 69) = 5.29$ ,  $p < .03$ . These results indicate that the levels of dysphoria reported by dysphoric students after distraction did not reach those of the nondysphoric students. Given that we predicted that the dysphoric-distracting group would be as nondysphoric and therefore as optimistic as the two nondysphoric groups, this finding could only weaken our results.

### Predictions About Future Events

We expected the predictions of dysphoric students made to ruminate to be more pessimistic than those of dysphoric students made to distract or those of nondysphoric students. All students listed six events or situations that they expected to experience in the future and rated each on a 7-point Likert scale on how likely it is that it would happen to them and on how happy it would make them. Events rated above the midpoint of the scale on predicted happiness were classified as happy (positive), and events rated at or below the midpoint were classified as unhappy (negative). (The midpoint of the scale was included in the classification of unhappy events because the distribution of ratings of predicted happiness was slightly skewed to the left.) Overall, students listed about twice as many happy events ( $M = 4.25$ ,  $SD = 1.26$ ) as unhappy events ( $M = 1.74$ ,  $SD = 1.32$ ), and there were no significant differences in the number of happy or unhappy events listed among the four groups. However, according to the results of a planned contrast, dysphoric ruminators offered significantly lower probabilities overall for the six events that they listed than the other three groups,  $F(1, 69) = 9.78$ ,  $p < .003$  (see Table 2). Results of pairwise comparisons revealed that dysphoric ruminators provided significantly lower probabilities than dysphoric distractors,  $F(1, 69) = 10.08$ ,  $p < .002$ , and that dysphoric distractors did not offer overall probabilities for events that were significantly different from those offered by nondysphoric ruminators or nondysphoric distractors (both  $F$ s  $< 2$ ). Because roughly four of the six events were positive ones for most students, these

lowered likelihood ratings given by the dysphoric ruminating students suggested that these students were more pessimistic about whether they would experience happy events or situations in their future. Indeed, results of a planned contrast suggested that the dysphoric-ruminative group rated happy events as significantly less likely to happen to them than the other three groups did,  $F(1, 69) = 7.20$ ,  $p < .01$  (see Table 2). Furthermore, pairwise comparisons showed that dysphoric ruminators rated happy events as significantly less probable than dysphoric distractors did,  $F(1, 69) = 7.01$ ,  $p < .01$ , and that the likelihood ratings for happy events provided by dysphoric distractors did not significantly differ from those provided by nondysphoric ruminators or nondysphoric distractors (both  $F$ s  $< 1$ ). Students who were induced to ruminate did not significantly differ from students in the other three groups in their probability estimates for unhappy events,  $F(1, 69) = 1.14$ , *ns*. The results of a one-way ANOVA also showed that the mean likelihood ratings for unhappy events did not significantly differ among the four groups,  $F(3, 57) = 1.15$ , *ns*. As noted, however, most students listed only one or two unhappy events, probably because the task pulled for events students hoped would happen in the future.

## Discussion

When asked to list events that might happen to them in the future, dysphoric students who ruminated named the same number of happy events as dysphoric students who distracted or the nondysphoric students. But the dysphoric students who ruminated rated the likelihood of happy events in their future as significantly lower than did the other three groups. This may suggest that dysphoric participants who ruminate have the same hopes or goals, in terms of happy events or situations, as dysphoric participants who distract or nondysphoric participants; however, they have lower expectations for meeting those goals. Cognitive theories of depression (Abramson et al., 1989; Bandura, 1986; Beck, 1967, 1987) suggest that the lower expectations of dysphoric ruminators would lead them to fail to enact the control they do have over their futures, increasing the probability that they truly will not attain their goals. In contrast, dysphoric students who distracted were no different in their expectancies for future positive events than the nondysphoric students. Thus, distraction may lead dysphoric individuals to feel more optimistic and self-efficacious, increasing the probability that they will attain their goals.

There were no differences among dysphoric ruminators, dysphoric distractors, and the nondysphoric ruminators and distractors in their ratings of the probability of future negative events. The fact that a mean of fewer than two negative events was generated by each student may have made it more difficult to obtain significant differences among groups. Also, Lewinsohn and his colleagues (1981) found significant differences between depressed people who improved and depressed people who did not improve in their expectations about positive outcomes but not in their expectations about negative outcomes.

In Study 3, we investigated the effects of rumination and distraction on dysphoric and nondysphoric students' ability to generate good solutions to common interpersonal problems. We predicted that dysphoric students made to ruminate would gen-



Table 2  
*Likelihood Ratings for Future Events (Study 2) and Problem-Solving Effectiveness (Study 3) of the Four Groups*

Rating	Group			
	Dysphoric-ruminative	Dysphoric-distracting	Nondysphoric-ruminative	Nondysphoric-distracting
Likelihood				
All events				
<i>M</i>	4.83	5.47	5.63	5.32
<i>SD</i>	0.92	0.62	0.73	0.72
Happy events				
<i>M</i>	4.76	5.25	5.53	5.40
<i>SD</i>	1.08	0.60	0.94	0.76
Problem solving				
Effectiveness				
<i>M</i>	2.97	3.97	4.03	3.94
<i>SD</i>	1.45	1.57	1.14	1.73
Percentage of model solutions				
<i>M</i>	48.2	59.4	77.3	64.4
<i>SD</i>	32.2	35.0	19.0	30.5

erate significantly poorer solutions to problems than the other three groups. This study also allowed us to test the hypothesis that the poorer problem solving expected in the dysphoric students who ruminated would be linked to more pessimistic thinking about these problems (i.e., more pessimistic attributions for the causes of the problems).

### Study 3

#### Method

#### Participants and Procedure

Sixty-nine Stanford University introductory psychology students (36 women and 33 men) received course credit for their participation in this study. Potential participants completed the BDI-SF at the beginning of the quarter. On the basis of the classification procedure used in the previous two studies, 36 students (19 women and 17 men) were dysphoric ( $M = 10.81$ ,  $SD = 3.89$ ) and 33 students (17 women and 16 men) were nondysphoric ( $M = 1.45$ ,  $SD = 1.18$ ). Students participated within 2 weeks after completing the BDI-SF. The procedure was identical to that used in Studies 1 and 2, except that after the two sets of mood questionnaires and the response manipulation tasks, students completed an interpersonal problem-solving task.

#### Problem-Solving Task

The measure of interpersonal problem solving was adapted from Platt and Spivack's (1975) MEPS. Students were presented with the beginnings and endings of four interpersonal problem situations (order was counterbalanced across students) and were asked to imagine themselves experiencing these situations (or stories). Instructions were as follows:

For each story, you will be given the beginning of the story and how the story ends. Your task is to make up a story that connects the beginning that is given to you with the ending that is given to you. In other words, you are to provide a middle for each story.

In other words, the students' task was to describe in writing what they would do to bring about the specified ending. They were reminded that their goal was not to be creative but to try to imagine themselves expe-

riencing the particular situation and to describe in writing what they would do in that situation.

The original MEPS was designed for use with a clinical sample and included problem situations bearing little relevance to the lives of undergraduates (e.g., "gaining revenge on an SS trooper" and "not getting along with the foreman"). Thus, we modified three of the situations used by Platt and Spivack (1975) for use with a nonclinical undergraduate population and added a fourth situation describing one of the most common problems undergraduates face: an achievement problem with an interpersonal element. Thus, the situations described four problems: (a) you realize that a friend is avoiding you, (b) your boyfriend/girlfriend tells you that he or she is very angry with you, (c) your professor writes to you that you may fail a class, and (d) you realize that a committee's suggestions will not work. The following is an example of one of the problem situations:

You notice that one of your friends seems to be avoiding you. You really like and enjoy spending time with this person, and want him or her to like you. The situation ends when he or she likes you again. Begin the story when you notice your friend avoiding you.

Two raters unaware of students' dysphoria status and manipulation condition scored each student's responses to the four situations. Two types of dependent measures were used in the assessment: measures of problem-solving effectiveness and measures of causal explanations.<sup>2</sup>

<sup>2</sup> We did not use the coding scheme devised by Platt and Spivack (1975), which involves counting the number of "relevant" solutions participants name, because that scheme was developed specifically for use with a clinical sample (so that any relevant, but not necessarily very effective, solution was considered good problem solving). In addition, the previous coding scheme was designed for use with the original situations on the MEPS, and we modified those situations. Our measure of the number of "model" solutions students generated in response to the modified situations was very similar in purpose to Platt and Spivack's measure of relevant solutions, however. As a result of criticisms of the MEPS scoring procedure (Butler & Meichenbaum, 1981; Nezu et al., 1989) suggesting that a qualitative assessment might better capture differences between good and poor problem solvers, we also developed a global measure of problem-solving effectiveness to assess more fully the quality of students' solutions to the situations.

To increase the objectiveness of the ratings of problem-solving effectiveness, we initially presented each of the four situations to eight independent judges and instructed them to list the steps or solutions involved in what they believed to be a "model" response to each situation. Because there was a high degree of consensus among judges, we compiled their responses. Thus, for each situation, there was a set of model solutions. For example, the model solutions (or steps) for the situation involving a friend's avoiding included (a) going to see the friend in person, (b) approaching the issue in a tactful way, and (c) saying something to reaffirm the friendship. Examples of solutions that were not model solutions were (a) avoiding the friend, (b) acting mean or insensitive toward the friend, and (c) blaming or criticizing the friend when discussing the issue.

Two measures of problem-solving effectiveness (or competence) were scored for each situation. First, each student's responses to the four situations were given global ratings of problem-solving effectiveness on 7-point Likert scales ranging from *not at all effective* (1) to *extremely effective* (7). When making this rating, raters were instructed to consider the entire set of solutions or strategies offered by students in each particular response. Second, we calculated the percentage of all solutions offered by students that were model solutions. The students' average over the four problem situations for these two measures of problem-solving effectiveness was also determined. Agreement between the two raters was good to excellent on both of the problem-solving measures. The intraclass correlation coefficients for the four situations ranged from .82 to .92 ( $M = .87$ ) for the percentage of model solutions and from .85 to .98 ( $M = .93$ ) for the global effectiveness rating.

Three of the four situations contained a clearly negative event: a friend avoiding you, a girlfriend/boyfriend being angry with you, and a professor telling you that you are failing a class. Students' responses to these three situations unfailingly included causal explanations for the negative events. As in Study 1, these explanations were coded for the three dimensions described by Abramson et al. (1978): stability, globality, and internality. All responses to the three negative situations contained easily codable attributions. Raters did not code students' responses to the fourth scenario, which involved making suggestions during a committee meeting, because this scenario did not contain an unambiguously negative event. The average of the three ratings of students' explanations over the three negative situations was also computed. Again, agreement between the two raters was very good. The intraclass correlation coefficients for the three situations that contained negative events ranged from .73 to .92 ( $M = .85$ ) for the stability ratings, from .79 to .92 ( $M = .83$ ) for the globality ratings, and from .78 to .85 ( $M = .82$ ) for the internality ratings.

### Results and Discussion

Eighteen students participated in the dysphoric-ruminative group, 18 in the dysphoric-distracting group, 16 in the nondysphoric-ruminative group, and 17 in the nondysphoric-distracting group.

#### Sex Differences

All analyses were initially performed with sex of students as a between-subjects variable. Only one significant main effect of sex was found. Women were more likely than men to give global explanations for negative events,  $t(65) = 2.06, p < .05$ . Mean ratings of globality were 3.12 ( $SD = 1.07$ ) for women and 2.63 ( $SD = 0.89$ ) for men. To assess whether these sex differences affected the results of analyses comparing the four groups of interest, we initially performed all analyses with sex of student as a third variable. Because there were no interactions between

sex and dysphoria status or response manipulation condition, all analyses reported were conducted by collapsing across sex of student.

#### Mood Manipulation Check

At the outset of the study, students in the dysphoric group had higher levels of dysphoria ( $M = 3.92, SD = 1.95$ ) than students in the nondysphoric group ( $M = 2.64, SD = 1.75$ ),  $F(1, 65) = 7.99, p < .006$ . As found in the previous two studies, the dysphoric-ruminative group showed significantly greater dysphoria after the response task manipulation than the other three groups in the study,  $F(1, 65) = 49.92, p < .0001$ . According to the results of planned pairwise comparisons, the dysphoric-distracting group reported significantly lower dysphoria than the dysphoric-ruminative group,  $F(1, 65) = 29.65, p < .0001$ , but did not differ in dysphoria from the nondysphoric-ruminative group or the nondysphoric-distracting group (both  $F_s < 1$ ).

#### Responses to the Problem-Solving Task

Previous studies have found that the effects of mood manipulations typically become attenuated during the course of a study (e.g., Needles & Abramson, 1992; Parrott & Sabini, 1990). This was not a concern in Studies 1 and 2 because students completed the dependent measures in these studies in approximately 5 min or less after the response task induction (i.e., rumination or distraction). However, in Study 3, because students' written responses to the four situations took an average of 30 to 40 min to complete, we expected the effects of the response task manipulation to be attenuated over the course of the problem-solving procedure. Analyses of students' responses to the first situation and their responses to the fourth and last situation supported this prediction; differences in the dependent measures of interest attributable to the rumination-distracting manipulation were greatest in students' responses to the first situation and had almost disappeared by the time students responded to the last situation. For the sake of simplicity, we present results of analyses using students' responses to the first situation. Note, however, that analyses using the average of students' responses to all four situations as the dependent variable yielded similar results (as described in the sections to follow).

*Problem-solving effectiveness.* The pattern of the mean ratings of the two measures of interpersonal problem-solving effectiveness supported our prediction that dysphoric students who ruminated would show poorer problem solving than the other three groups. As expected, the results of a planned contrast showed that the responses of dysphoric ruminators to the first situation were rated as significantly lower in global problem-solving effectiveness than those of the remaining three groups,  $F(1, 62) = 5.97, p < .02$  (see Table 2). [A planned contrast analysis using the mean effectiveness ratings of students across all four situations as the dependent variable yielded similar results,  $F(1, 58) = 3.86, p = .06$ .] According to the results of pairwise comparisons, the responses of the dysphoric ruminators to the first situation were rated as marginally significantly less effective than those of the dysphoric distractors,  $F(1, 62) =$

3.91,  $p < .06$ , and the dysphoric distractors did not significantly differ in the effectiveness of their responses from the nondysphoric ruminators or from the nondysphoric distractors (both  $F_s < 1$ ).

The results of a planned contrast suggested that students in the dysphoric-ruminative group offered a significantly lower percentage of solutions that were model solutions in response to the first situation than did the other three groups,  $F(1, 62) = 5.07$ ,  $p < .03$  (see Table 2). [A planned contrast analysis using the mean percentage of model solutions offered by students in response to all four situations as the dependent variable yielded similar results,  $F(1, 58) = 4.87$ ,  $p < .04$ .] Although the dysphoric-distracting group offered a mean of more than 10% model solutions than did the dysphoric-ruminative group, the results of a pairwise comparison between these two groups did not reach statistical significance,  $F(1, 62) = 1.19$ ,  $ns$ ; however, as predicted, the dysphoric-distracting group did not significantly differ from the nondysphoric-distracting group,  $F(1, 62) = 0.23$ ,  $ns$ , or from the nondysphoric-ruminative group,  $F(1, 62) = 2.82$ ,  $ns$ , in the mean percentage of model solutions offered.

*Causal attributions.* Ratings of the stability, globality, and internality of causal attributions were assessed by means of students' responses to the first of the three situations describing a negative event. As found in Study 1, the causal explanations for negative events generated by the dysphoric ruminators in response to the first situation were rated as significantly more stable,  $F(1, 64) = 8.30$ ,  $p < .006$ , and more global,  $F(1, 64) = 5.83$ ,  $p < .02$ , than those of the other three groups. Results of pairwise comparisons further supported these findings.

Analyses comparing the explanations offered by the dysphoric-ruminative group with those of the remaining three groups on ratings of internality yielded nonsignificant results,  $F(1, 64) = 0.23$ ,  $ns$ . Results of pairwise comparisons were also not significant. Thus, although the causal explanations for negative events of dysphoric ruminating students were more stable and more global than those of the other three groups, their explanations were not significantly more internal, failing to replicate Study 1's findings. Similarly, Gibbons et al. (1985) found that forcing psychiatric patients to self-focus did not lead them to accept more responsibility or blame for their illness, and Smith et al. (1985) found no relationship between private self-consciousness and the tendency for participants to make internal attributions for negative events. The results of this study, in conjunction with the results from other studies, suggest that perhaps rumination (or, more generally, self-focus) can lead to greater pessimism, but it does not necessarily lead depressed people to blame themselves for negative events. Yet, recent reformulations of the learned helplessness theory have emphasized that pessimistic attributions, even in the absence of self-blame, can exacerbate depression by making people feel that negative events are not controllable or preventable (e.g., Abramson et al., 1989; Peterson & Seligman, 1984; Sweeney et al., 1986). Recent tests of the hopelessness theory of depression (Abramson et al., 1989) by Metalsky and colleagues (Metalsky & Joiner, 1992; Metalsky, Joiner, Hardin, & Abramson, 1993) have also deemphasized the role of the internality dimension in predicting depressive symptoms.

In summary, the findings of this study generally supported

our predictions. Dysphoric students who ruminated generated poorer solutions to hypothetical problems than the other three groups. Interestingly, dysphoric students who ruminated also gave more pessimistic attributions than the other three groups for the causes of the problems that they were attempting to solve.

## General Discussion

The results presented here support the claim of several self-focusing and rumination theories (Carver & Scheier, 1990; Ingram, 1990; Lewinsohn et al., 1985; Nolen-Hoeksema, 1991; Pyszczynski & Greenberg, 1987; Smith & Greenberg, 1981) that self-focused rumination is associated with more negative thinking among dysphoric people than externally focused distraction. Dysphoric students induced to ruminate about their current feelings and personal characteristics subsequently gave more dysphoric, biased interpretations of events and offered more pessimistic attributions for events than dysphoric students induced to distract themselves from their moods for a short while. In contrast, dysphoric students induced to distract were no more negative, biased, or pessimistic in their thinking than nondysphoric students.

Previous studies have found that negatively distorted thinking, pessimistic expectations, and self-defeating attributions can maintain and exacerbate dysphoria (Abramson et al., 1989; Haaga, Dyck, & Ernst, 1991; Krantz & Hammen, 1979; Peterson & Seligman, 1984; Sweeney et al., 1986). Our studies, together with these previous investigations, suggest that one reason people who engage in self-focused rumination when dysphoric tend to remain dysphoric longer than those who do not is that they are more likely to be engaging in negative, depressogenic thinking than people who avoid ruminating when in a dysphoric mood.

As noted, the self-focusing theories argue that ruminative responses can potentiate negative thinking by augmenting the effects of negative mood on memory and information processing (Ingram & Smith, 1984; Lewinsohn et al., 1985; Nolen-Hoeksema, 1991; Pyszczynski & Greenberg, 1987; Smith & Greenberg, 1981). By drawing one's attention to dysphoria and depressive symptoms, ruminative responses increase the probability that the network of negatively biased thoughts, memories, and schemas will be activated. In support of this assertion, a recent study found that, relative to dysphorics induced to distract and nondysphorics, dysphoric individuals induced to ruminate spontaneously came up with more negative memories in a free-recall task and remembered negative events as having occurred more frequently in their lives (Lyubomirsky & Nolen-Hoeksema, 1994). In addition, a study using a self-focusing induction found that dysphoric participants who focused on themselves retrieved more negative events from their past than participants who focused externally (Pyszczynski et al., 1989). Thus, one way that ruminative responses may contribute to pessimistic thinking about the future is by enhancing dysphoric people's memories of negative events in the past. Similarly, by activating the network of negative memories, ruminative responses may lead to negatively biased interpretations and pessimistic causal explanations for events in one's life.

Although people may often engage in self-focusing and rumi-

native coping to try to understand and solve their problems, self-focused rumination also appears to interfere with good problem solving. In Study 3, we found that dysphoric students who ruminated generated the least globally effective solutions and the lowest percentage of model solutions to common interpersonal problems of any of the four groups. In contrast, dysphoric students who spent a few minutes lifting their mood through distraction before problem solving generated solutions that were rated as effective as those generated by the nondysphoric students. These results strongly suggest that it is important to teach people who tend to become dysphoric in response to problematic situations to use adaptive mood management techniques to lift their moods before they attempt to address their problems. They may also need to use mood management techniques periodically while they are attempting to solve their problems because the act of facing their problems may reinstate their dysphoric mood. That is, they may need to "take a break" occasionally from dealing with their problems to lift their moods through pleasant activities; then they can return to problem solving without the maladaptive effects of the mood on their thinking.

Rumination may impair problem solving among dysphoric people through its negative effects on thinking. Thus, dysphoric individuals who ruminate, in comparison with dysphoric individuals who avoid rumination, may be more likely to appraise their problems as significant threats to well-being, to believe that there are few solutions, to have self-doubts about their ability to solve them, or to give up hope on them completely. Rumination in combination with dysphoria may also lead people to believe that their problems are less controllable than they really are and, thus, to set emotion-focused (e.g., managing one's emotional reactions) rather than problem-focused (e.g., engaging in productive behaviors) goals (Carver, Scheier, & Weintraub, 1989; Mandler & Sarason, 1952).

Depressed mood plus rumination may also affect people's actual implementation of a problem solution by preventing them from effectively carrying out a solution (even if it is a good one) as a result of lack of energy or motivation, impaired concentration, and so forth (Lyubomirsky & Nolen-Hoeksema, 1993). And, finally, it is important to note that ineffective problem solving itself may actually lead an individual to experience more stress, more negative life events, and more problem situations, thus maintaining a vicious cycle between dysphoria and failure to solve problems (Billings & Moos, 1981).

Rumination in the absence of dysphoria was not associated with negatively biased thinking or poor problem solving, supporting the claim that rumination exacerbates depressogenic thinking and interferes with problem solving by enhancing the effects of dysphoria on cognition and information processing (cf. Bower, 1981). Clearly, people may have more motivation to self-evaluate when they are sad so as to understand and respond to the problems that may have led to their sadness (Carver & Scheier, 1990; Nolen-Hoeksema, 1991; Pyszczynski & Greenberg, 1987). But our results suggest that teaching dysphoric people to use pleasant or benign distractions to lift their mood before thinking about their problems could lead them to make fewer biased interpretations of those problems, to be more effective in overcoming their problems, and to be less pessimistic about their future. Although addressing distressing problems after successful distraction may

bring on some dysphoria once again, dysphoric people can be taught to alternate between thinking about how to solve their problems and using mood management techniques such as distraction, so that their dysphoria does not interfere with their problem solving.

### *Limitations*

Because the students in these studies were probably only mildly to moderately dysphoric, we do not know whether our results generalize to a clinically depressed population. Other studies suggest that, among clinically depressed patients, self-focusing tasks maintain depressed mood, and externally focusing tasks decrease depressed mood (Fennell & Teasdale, 1984; Gibbons et al., 1985); however, the effects of focusing manipulations on the thinking and problem-solving skills of clinically depressed patients are largely unknown. This is an important area for future research.

In addition, the Beck Depression Inventory, which we used to identify our two groups of students, has been criticized as a measure of nonspecific negative affect rather than depression per se (Kendall, Hollon, Beck, Hammen, & Ingram, 1987). More to the point, depressed mood tends to co-occur with other negative moods, such as anxiety and hostility (Kendall et al., 1987). Our rumination and distraction manipulations may have affected levels of these other moods, as well as levels of depression, in our dysphoric students. Scheier and Carver (1977) showed that a simple self-focusing manipulation (putting participants in a room with a mirror) elevated whatever negative affect participants were experiencing at the time. Although the response styles theory focuses on ruminative and distracting responses to depressed mood, we suspect that rumination, defined as focusing on one's current feeling state and its implications, can maintain or enhance negative moods other than depression (and distraction can relieve other negative moods) by enhancing the effects of a negative mood on the network of thoughts and memories associated with that mood. For example, rumination about one's feelings of anger may heighten that anger by enhancing the effects of the angry mood on the accessibility of related thoughts. This is another important area for future research.

One may argue that our studies require a control group in which participants engage in neither self-focused nor externally focused responses. Although this group superficially appears to be a true "control," it would not serve its intended purpose. Participants in this control group would be asked to "do nothing" while the other groups are engaging in either the self-focused or the externally focused task. While they wait, these control participants could only choose between focusing on themselves and focusing on something other than themselves because there would be no other alternative. Evidence from a study by Fennell and Teasdale (1984) suggests that depressed people told just to sit in a quiet room and do nothing tend to ruminate during that time. It is plausible that nondysphoric participants told to do nothing do not tend to ruminate about negative emotions during that time, however. If the participants in a control group were not made to wait while other participants completed the rumination or distraction task but instead proceeded directly to the tasks operationalizing our dependent variables

(e.g., problem solving), then the self-focusing properties of whatever task they worked on immediately before problem solving should influence their problem-solving performance. We therefore argue that it is not possible to have a "no-treatment control" in studies of focusing manipulations in dysphoric versus nondysphoric participants. Moreover, such a group is not necessary to test the main hypotheses coming from our theory and other self-focusing theories: that dysphoric people who ruminate show more pessimistic thinking and poorer problem solving than dysphoric people who distract themselves for awhile before attempting to solve problems or think about events in their life.

It would have been informative to have measures of participants' thinking and problem-solving abilities before the rumination and distraction inductions to determine the effects of these inductions on changes in thinking and problem solving. We did not obtain measures of thinking and problem solving in participants before the inductions because this would have alerted them to the true focus of these studies and thus would have compromised the studies. These measures are extensive and memorable; participants would surely have recognized them the second time they completed them, even if we had had the participants initially complete the measures several weeks before the experimental session. We believe that a strong advantage of our experimental paradigm is the elaborate cover story we use to hide the true purpose of the experiments from the participants, thus overcoming the demand effects that have plagued many experiments on mood and cognition. We believed that preventing demand effects in these experiments was much more important than obtaining preinduction measures of thinking and problem solving.

### Conclusions

Our previous studies have shown that the ruminative coping style is a stable personality characteristic (Nolen-Hoeksema et al., 1994). The current studies suggest that people with the ruminative coping style not only experience more prolonged dysphoric reactions to problems but also may be more negatively biased in their interpretations of these problems and more impaired in their ability to solve them than people who lift their dysphoric moods through short-term distraction before evaluating their situations. In turn, such pessimistic thinking and poor problem solving, according to many studies on dysphoria, can maintain and exacerbate dysphoric affect.

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