

## Why Ruminators Are Poor Problem Solvers: Clues From the Phenomenology of Dysphoric Rumination

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The phenomenology of dysphoric rumination and its consequences for problem solving were explored in 3 studies. In Study 1, self-focused rumination, compared with distraction, led dysphoric participants to rate their own biggest problems as severe and unsolvable and to report a reduced likelihood of actually implementing their solutions. Clues into the mechanisms behind these findings were explored in Study 2. The results showed that dysphoric ruminative thought is characterized by a focus on personal problems combined with a negative tone, self-criticism, and self-blame for problems as well as reduced self-confidence, optimism, and perceived control. Finally, Study 3 revealed a direct relationship between the negatively biased content of ruminative thoughts and reduced willingness to solve one's problems. Implications of these findings for the consequences of self-focused rumination are discussed.

Depressed mood is often accompanied by pessimism, passivity, and reduced motivation to continue performing one's work, social responsibilities, or even simple daily chores (Beckham & Leber, 1995). When faced with troubling problems, dysphoric individuals may be unable to come up with good solutions or lack confidence in their problem-solving skills. Alternatively, they may know what they must do to accomplish a task or the steps they need to take to solve an immediate problem, but they are unwilling or unable to do it. Furthermore, those who respond to their depressed mood by engaging in self-focused rumination—that is, by repetitively focusing on themselves and on the nature and implications of their negative feelings—may be putting themselves even more at risk for hopelessness, sluggishness, and inertness when it comes to initiating problem solving or taking constructive action. In the first study reported here, we explored hypotheses about the impact of dysphoric rumination on several aspects of the problem-solving process, including the appraisal of problems and problem solutions. In particular, we were interested in the possibility that ruminating while depressed may lead to reduced willingness to tackle problems, even when one has confidence in a number of possible and effective solutions. Clues into the mechanisms by which this may occur were obtained in subsequent studies by asking the following question: What exactly do dysphoric individuals do when they ruminate?

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Although recent interest in ruminative thinking (e.g., Wyer, 1996) has prompted a number of reconceptualizations of rumination (e.g., as reflecting a broad class of instrumentally oriented recurring thoughts; Martin & Tesser, 1996), we focused on a specific kind of ruminative thinking that is not adaptive or instrumental (cf. Nolen-Hoeksema, 1996; Nolen-Hoeksema & Morrow, 1991; see also Erber & Wegner, 1996; Wanke & Schmid, 1996). In contrast to structured problem solving, ruminative responses to depressed mood involve thoughts about how sad, lethargic, and unmotivated one feels (e.g., "Why can't I get going?") without doing anything to relieve those symptoms, or worrying about the problems that are making one depressed (e.g., "What will happen if I don't finish that project at work?") without making plans to change one's situation (Nolen-Hoeksema, 1991). An adaptive alternative to a ruminative response is to use pleasant or benign distractions to relieve one's depressive symptoms and, only then, if necessary, to engage in problem solving. Distracting responses are thoughts and behaviors that take one's mind off of one's depressed mood and its consequences and turn it to pleasant, engaging, or neutral thoughts and activities (Nolen-Hoeksema, 1991; cf. Csikszentmihalyi, 1990). Examples include going out to dinner with friends or concentrating on a hobby, a favorite sport, or on one's work.

An increasing number of studies provide evidence that ruminative responses are associated with longer and more severe depressed moods than are distracting responses. In the laboratory, manipulations of rumination or self-focus maintain depressed mood, whereas distraction or externally focused manipulations lead to significant relief from depressed mood (Fennell & Teasdale, 1984; Gibbons et al., 1985; Lyubomirsky & Nolen-Hoeksema, 1993, 1995; Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema & Morrow, 1993a; see also Rusting & Nolen-Hoeksema, 1997, for the effects of rumination on angry mood). Longitudinal studies of naturally occurring depressed moods show that people who respond to those moods with rumination report more severe and longer periods of depressed mood than people who use pleasant activities to manage their moods, even after controlling for the initial severity of the mood (Nolen-Hoeksema

& Larson, 1999; Nolen-Hoeksema, McBride, & Larson, 1997; Nolen-Hoeksema, Morrow, & Fredrickson, 1993; Nolen-Hoeksema, Parker, & Larson, 1994; Wood, Saltzberg, Neale, Stone, & Rachmiel, 1990; see also Salzberg, 1992). For example, students who expressed a ruminative response style in an assessment just before the 1989 San Francisco-area earthquake were significantly more dysphoric after the earthquake than students with a less ruminative style, even after their levels of depressed mood before the earthquake were statistically controlled (Nolen-Hoeksema & Morrow, 1991).

### Effects of Dysphoric Rumination on Problem Solving

A recent study suggested that dysphorics who respond to depressed mood by ruminating about themselves and their symptoms show impaired problem-solving skills (Lyubomirsky & Nolen-Hoeksema, 1995). After engaging in either a ruminative or distracting task, students were instructed to imagine themselves experiencing a number of interpersonal and achievement problems (e.g., "a friend seems to be avoiding you;" cf. Platt & Spivack, 1975) and then write detailed descriptions of the steps they would take to resolve each problem. Dysphoric participants who ruminated generated poorer solutions to the hypothetical problems than dysphoric participants who distracted themselves or nondysphorics who ruminated or distracted themselves (see also Brockner, 1979; Brockner & Hulton, 1978; Davis & Nolen-Hoeksema, 1999; Strack, Blaney, Ganellen, & Coyne, 1985).

Why might dysphoric rumination interfere with effective problem solving? One set of clues comes from studies examining the link between mood and cognition. We have previously argued that ruminative responses to depressed mood may impair problem solving by activating a vicious cycle between depressed mood and negative, depressogenic thinking (Lyubomirsky & Nolen-Hoeksema, 1995; see also Teasdale, 1983). Researchers have provided converging evidence that rumination and self-focus serve to amplify the effects of negative mood on thinking while distraction interferes with these effects (Carver & Scheier, 1990; Ingram, 1990; Ingram & Smith, 1984; Lewinsohn, Hoberman, Teri, & Hautzinger, 1985; Lyubomirsky & Nolen-Hoeksema, 1995; Musson & Alloy, 1988; Nolen-Hoeksema, 1991; Pyszczynski & Greenberg, 1987; Smith & Greenberg, 1981; Teasdale, 1983, 1985). A number of studies have suggested that negative moods selectively prime mood-related information (e.g., activating networks of negative memories, as well as pessimistic beliefs, attributions, and expectations about the self and the world; e.g., Bower, 1981, 1991; Clark & Teasdale, 1982; Gotlib, Roberts, & Gilboa, 1996; Krantz & Hammen, 1979; Teasdale, 1983, 1985; Teasdale & Fogarty, 1979). Negative moods may also lead to negatively biased judgments when people use them as heuristics (e.g., "How do I feel about it?") in making evaluations (Schwarz & Bohner, 1996; Schwarz & Clore, 1987). Although it is the depressed mood that primes the negative thoughts, self-focused rumination directs the individual's attention to these thoughts and allows them to affect the individual's judgments and behavior, including playful thinking and problem solving. In turn, these negatively biased judgments and failed problem-solving efforts amplify depressed mood, creating a vicious cycle between depressed mood and thinking (Teasdale, 1983).

Several laboratory studies have demonstrated the effects of dysphoric rumination on negative thinking (Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998; Lyubomirsky, Kasri, Trinh, & Olson-Tinker, 1999; Lyubomirsky & Nolen-Hoeksema, 1995). For example, dysphoric participants induced to ruminate subsequently gave more pessimistic attributions for hypothetical interpersonal problems and troubling situations, chose more depressive and distorted interpretations of hypothetical life events, endorsed more negative trait adjectives as self-descriptive, and were less hopeful about future positive events in their own life than dysphorics who were distracted from their mood or than nondysphoric controls (Lyubomirsky et al., 1999; Lyubomirsky & Nolen-Hoeksema, 1995). In another set of studies, relative to distraction, rumination in the presence of a depressed mood led students to spontaneously retrieve more negative memories from their recent past and recall negative events (such as "my parents punished me unfairly") as having occurred more frequently in their lives (Lyubomirsky et al., 1998). In all of these studies, the dysphoric participants who were instructed to distract for 8 min proved to be no more pessimistic or negative in their thinking than the nondysphorics (see also Nolen-Hoeksema et al., 1994; Pyszczynski, Hamilton, Herring, & Greenberg, 1989; Pyszczynski, Holt, & Greenberg, 1987).

### Overview of the Present Studies

Accumulating evidence suggests that self-focused rumination may interfere with effective problem solving among dysphoric individuals through its negative effects on thinking. For example, individuals who ruminate in response to a depressed mood, in contrast to those who avoid rumination, may be inclined to judge their problems as more threatening, overwhelming, and less controllable than they really are, to have self-doubts about their ability to solve their problems, to believe that there are few solutions, or to give up hope on their problems completely. Therefore, in the first set of hypotheses of our first study, we explored the general notion that dysphoric rumination would be associated with negatively biased evaluations of the problem-solving process. Specifically, we predicted that dysphorics who ruminate in response to their mood would show little confidence in the solutions that they generate to their own problems and would feel that their solutions are not effective. Consequently, we expected that dysphoric ruminators would be less willing to carry out such "inferior" solutions.

An interesting alternative set of hypotheses, however, is suggested by Bandura's (1986) social-cognitive theory, as well as by the results of a previous study from our laboratory. Social-cognitive theory makes a distinction between outcome expectations (i.e., expectations regarding behavioral outcomes) and efficacy expectations (i.e., expectations regarding one's ability to execute these behaviors). Individuals who do not expect to adequately or effectively perform a particular behavior (e.g., carry out a solution to a problem) will not be willing to do it, even if they believe that the outcome of the behavior would be positive (i.e., the problem would be solved; see Bandura, 1989; Bandura & Cervone, 1983). Supporting this notion, Lyubomirsky and Nolen-Hoeksema (1993) found that rumination reduced dysphoric students' willingness to engage in pleasant, distracting activities that could relieve their de-

pressed mood (e.g., renting a movie or going to the beach), even when they believed that they would enjoy these activities (see also Nolen-Hoeksema & Jackson, 1996; Wenzlaff, Wegner, & Roper, 1988). Thus, our second, alternative set of predictions for Study 1 was that, relative to nondysphorics and dysphorics who distract themselves, dysphorics who engage in self-focused rumination would show a reduced willingness to implement their problem solutions, even if they were confident in the effectiveness of these solutions, because they would have reduced efficacy expectations. Our rationale was that self-focused rumination, by sapping dysphoric individuals' energy and motivation, may lower their efficacy expectations and, thus, their willingness to tackle current problems.

Both sets of hypotheses (i.e., those derived from the response style theory [Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-Hoeksema, 1991] and those additionally derived from social-cognitive theory [Bandura, 1986]) presumed that dysphoric rumination interferes with the problem-solving process, either by depressing confidence in one's problem-solving abilities or by depressing motivation to initiate constructive problem-solving behavior, respectively. Accordingly, following both theories, we expected dysphoric students who engaged in rumination to construe their own current problems as relatively unsolvable and severe.

The purpose of Study 1 was to begin testing these ideas by examining people's judgments of the most difficult problems they were currently facing, as well as their confidence in their own solutions to these problems and their willingness to implement them. Thus, we were able to explore several aspects (or "stages") of the problem-solving process simultaneously. Our focus in this particular study, however, was on people's perceptions of their problems and problem solutions, rather than their actual problem-solving skills. Boosting the study's ecological validity, participants reported their perceptions of real-life current problems, rather than hypothetical ones (see Lyubomirsky & Nolen-Hoeksema, 1995).

How might self-focused rumination interfere with dysphoric individuals' problem-solving efforts? We reasoned that insights into the link between rumination and the problem-solving process may be revealed in an examination of naturally occurring ruminative thoughts. Although researchers have often speculated about the phenomenology of rumination, they have not yet systematically explored what dysphoric people think about when they ruminate. In Studies 2 and 3, dysphoric and nondysphoric participants "ruminated outloud," allowing us to observe the nature of their ruminative thinking and look for clues into its deleterious effects on problem-solving motivation, as well as general effectiveness.

## Study 1

### Method

#### Overview

Dysphoric and nondysphoric participants engaged in either a ruminative or distracting task and then listed their three biggest current problems and possible solutions to these problems. Participants rated each of their listed problems on the problem's severity and solvability and then rated their confidence in their listed problem solutions,

the likelihood that their solutions would work if carried out, and the likelihood that they would actually carry out their solutions. Depressed mood was assessed before and after the response-manipulation task.

#### Participants

Ninety students (49 women and 41 men) recruited from an introductory psychology class at the University of California, Riverside, received course credit for their participation in this study. Potential participants completed the Beck Depression Inventory (BDI; Beck, 1967) as part of a larger packet of unrelated questionnaires at the beginning of each quarter. On the basis of past recommendations (Beck, 1967), students with BDI scores of 12 or above were recruited for the dysphoric group and students scoring below 5 were recruited for the nondysphoric group. Because the BDI has demonstrated good test-retest reliability after 3 months among college undergraduates (Pearson's  $r = .90$ ; Beck, 1967), 45 dysphoric (25 women and 20 men) and 45 nondysphoric (24 women and 21 men) students participated within 1 month after completing the BDI.

#### Materials

*Mood questionnaires.* Participants completed two packets of mood questionnaires during the experiment. Each packet contained a questionnaire that asked participants to rate their present state, including levels of sadness and depression, on Likert scales (1 = *not at all*; 9 = *extremely*). Mood questionnaires were administered at the beginning of the experiment and immediately following the response-manipulation task (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, recklessness, etc.) to help disguise the study's focus on mood. Likert scales, instead of the BDI, were used to assess mood during the experimental hour because we felt that the BDI's obvious focus on depressive symptoms would be more likely to reveal the hypotheses of the study. The Likert-scale measure of mood at the beginning of the experimental hour has been found to be highly correlated with participants' preexperimental BDI scores (e.g., Lyubomirsky & Nolen-Hoeksema, 1995) and was included following previous recommendations (Kendall, Hollon, Beck, Hammen, & Ingram, 1987). To further obscure the intent of the study, several filler tasks, such as paper-and-pencil inventories about imagining colors and recalling one's dreams, were included in the packets of mood scales.

*Response-manipulation tasks.* The response-manipulation tasks were designed to influence the content of participants' thoughts by requiring them to focus their attention and "think about" a series of 45 items (adapted from Lyubomirsky & Nolen-Hoeksema, 1993, 1995; Morrow & Nolen-Hoeksema, 1990). Following Nolen-Hoeksema's (1991) definition of ruminative responses, the rumination condition required participants to focus their attention on thoughts that were emotion-focused, symptom-focused, and self-focused, although participants 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," "your character and who you strive to be," and "why things turn out the way they do." In contrast, participants randomly assigned to 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 truckload of watermelons." The items in the

rumination and distraction conditions (a total of 90) were rated as equally neutral by nondysphoric judges. In each condition, participants spent exactly 8 min focusing on the items.<sup>1</sup>

**Problem solutions task.** Participants were instructed to list the three largest problems that they were currently facing (e.g., with family, friends, work, school, finances, etc.). Immediately following each of the listed problems, participants were asked (a) how likely they would be able to solve or alleviate this problem and (b) how severe this problem was (1 = *not at all*; 4 = *somewhat*; 7 = *extremely*). The order of these two questions was counterbalanced. They were then asked to list three possible solutions for each problem and to rate each of these listed solutions, using 7-point Likert scales (1 = *not at all*; 7 = *extremely*), on (a) how confident they were that this solution would be effective, (b) how likely they thought that this solution would work if carried out, and (c) how likely they thought that they would actually go ahead and use this solution to solve this problem.

Two independent raters, who were blind to participants' dysphoria status and manipulation condition, separately scored each participant's responses to the problem solutions task using 7-point Likert scales (1 = *not at all*; 7 = *extremely*). First, each listed problem was rated for severity and solvability. Following criteria developed by Lyubomirsky and Nolen-Hoeksema (1995), the raters then evaluated each of the participants' three listed solutions on how effective, realistic, and difficult to carry out they were. Agreement between the two raters was very good to excellent on all measures. The intraclass correlation coefficients ranged from .83 to .98 ( $M = .93$ ).

### Procedure

All participants were tested individually, with the experimenter unaware of their dysphoria status and manipulation condition. An elaborate cover story was used to minimize possible demand characteristics. At the beginning of the experiment, participants 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, which were embedded among the questionnaire packets that participants completed throughout the experiment. Participants' responses on a debriefing questionnaire and their comments during oral debriefing indicated that the cover story was successful. No participant guessed the purpose of the study or the link between the response manipulations and the problem solutions task.

After describing the cover story, the experimenter gave participants the first packet of questionnaires, which contained baseline measures of depressed mood, and left the laboratory room. To reduce all possible distractions, participants were instructed to flick a switch (connected to a light-bulb outside the room) to signal the experimenter when they had completed each packet of questionnaires. After they were done with the first packet, the experimenter reentered the laboratory room and introduced the response-manipulation task. This task was described as an imagination task requiring participants "to focus [their] mind on a series of ideas and thoughts" and to "use [their] ability to visualize and concentrate." They were told to spend exactly 8 min on this task. As a manipulation check, participants were asked in a debriefing questionnaire administered at the end of the study to recall the instructions for this task and to describe exactly what they did during the allotted 8 min. Participants' 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 participants 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 problem solutions task, which was self-explanatory. After completing this task, participants filled out a final packet of questionnaires. This packet included several filler measures and a debriefing questionnaire, which asked ques-

tions regarding the experiment (e.g., "how closely were you able to follow the instructions?"; "how difficult was it for you to think of the three problems?"; and "how difficult was it for you to think of solutions?"). Participants' responses indicated that they were able to follow the instructions as requested. The experimenter then returned and administered a thorough debriefing. The entire study lasted approximately 1 hr.

## Results

### Overview

Because there were no main effects or interactions with sex, question order, or quarter during which the study was conducted, all analyses were conducted by collapsing across these variables. In this study, we tested predictions about whether the dysphoric-ruminative group would differ from the other three groups (dysphoric-distracting, nondysphoric-ruminative, and nondysphoric-distracting) in their responses to the problem solutions task. Rosenthal and Rosnow (1985; see also Rosnow & Rosenthal, 1989, 1995) argued that the appropriate way to test such focused predictions is by planned contrasts rather than by two-way analyses of variance. Thus, analyses using planned contrasts comparing the dysphoric-ruminative group with the other three groups were performed on all the dependent measures of interest. In addition, separate planned contrasts were conducted between the dysphoric-distracting group and the dysphoric-ruminative group, as well as between the dysphoric-distracting group and the two nondysphoric groups (see Lyubomirsky & Nolen-Hoeksema, 1993, 1995, for similar procedures).

### Mood-Manipulation Check

At the beginning of the study, students in the dysphoric group reported greater dysphoria ( $M = 4.20$ ,  $SD = 2.23$ ) than students in the nondysphoric group ( $M = 2.27$ ,  $SD = 1.66$ ),  $t(81) = 4.67$ ,  $p < .0001$ . The results of a planned pairwise comparison on changes in depressed mood for dysphoric participants in the rumination and distraction conditions revealed a significant difference between the two groups, which suggested that dysphorics who were instructed to ruminate became more dysphoric ( $M = 0.87$ ,  $SD = 1.85$ ) and dysphorics who were instructed to distract became less dysphoric ( $M = -0.59$ ,  $SD = 1.23$ ),  $F(1, 86) = 12.91$ ,  $p < .0005$ . By contrast, according to a pairwise comparison, no differences in changes in depressed mood were found between nondysphoric participants who ruminated ( $M = 0.16$ ,  $SD = 1.34$ ) and those who distracted ( $M = -0.13$ ,  $SD = 0.82$ ),  $F < 1.00$ , *ns*. Furthermore, planned contrasts revealed that after the response-manipulation task, dysphoric ruminators had significantly higher levels of depressed mood compared with the other three groups,  $F(1, 86) = 25.72$ ,  $p < .0001$ , and compared with dysphoric distractors in particular,  $F(1, 86) = 5.32$ ,  $p < .03$ . Mean levels of depressed mood following the response-manipulation task were as follows:

<sup>1</sup> Although rumination that is induced with experimental stimuli is likely to differ from naturalistic rumination, a manipulation of rumination versus distraction was necessary to examine cause-and-effect relationships. Furthermore, including a no-treatment control group, in which participants did nothing during the 8 min, was judged to be ineffective because dysphoric participants are likely to ruminate during this period, whereas nondysphorics are likely to distract themselves (e.g., Fennell & Teasdale, 1984).

dysphoric-ruminative,  $M = 4.96$ ,  $SD = 2.24$ ; dysphoric-distracting,  $M = 3.73$ ,  $SD = 1.97$ ; nondysphoric-ruminative,  $M = 2.61$ ,  $SD = 1.57$ ; and nondysphoric-distracting,  $M = 1.96$ ,  $SD = 1.19$ .

*Responses to the Problem Solutions Task*

Previous studies have found that the effects of mood manipulations typically become attenuated during the course of a study (e.g., Lyubomirsky & Nolen-Hoeksema, 1995; Needles & Abramson, 1992; Parrott & Sabini, 1990). Because students' written responses to the problem solutions task took an average of 20 min to complete, we expected the effects of the response-manipulation task to be diminished over the course of the procedure. Analyses of students' judgments of the first problem they listed and of their judgments of the second and third problems supported this prediction: Differences in the dependent measures of interest attributable to the rumination-distraction manipulation were greatest in students' responses to the first problem and had been reduced by the time students responded to the last problem. For the sake of simplicity, we present results of analyses using students' responses to the first problem. It should be noted, however, that analyses using the average of students' responses to all three problems as the dependent variable yielded similar results.

*Ratings of problem severity and solvability.* According to both sets of hypotheses, dysphoric participants who were induced to ruminate were predicted to rate their problems as most severe and least solvable of the four groups in the study. According to the results of a planned contrast comparing the dysphoric-ruminative group with the other three groups, dysphoric ruminators did indeed rate their first problem as more severe,  $F(1, 86) = 7.52$ ,  $p < .008$ ,

and less solvable,  $F(1, 86) = 15.89$ ,  $p < .0001$ , than dysphoric distractors, nondysphoric ruminators, and nondysphoric distractors. In addition, according to a pairwise comparison, dysphoric ruminators rated their first problem as more severe,  $F(1, 86) = 7.05$ ,  $p < .01$ , and less solvable,  $F(1, 86) = 5.18$ ,  $p < .03$ , than dysphoric distractors; and, as predicted, the dysphoric-distracting group did not significantly differ in ratings of severity ( $F < 1.00$ ) or solvability ( $F < 1.00$ ) of the first problem from the two nondysphoric groups. Mean ratings for severity and solvability are shown in Table 1.

Coders' ratings of severity and solvability, however, did not mirror these patterns of results. The results of planned contrasts comparing coders' ratings of the severity and solvability of the first problem generated by the dysphoric-ruminative group with those of the other three groups failed to show significant differences (both  $F$ s  $< 2.00$ ). Omnibus one-way analyses of variance also suggested no differences among groups.

*Ratings of problem solutions.* Disconfirming our first set of hypotheses, no significant differences were found in the results of analyses comparing dysphoric ruminators and the other three groups in their reported confidence in the effectiveness of their solutions and in the likelihood that their solutions would work if carried out (both  $F$ s  $< 1.00$ ; see Table 1). Although the dysphoric-distracting group appeared to show lower mean ratings than the other three groups, results of post hoc Scheffé contrasts for these two variables comparing the dysphoric-distracting group with the other three groups did not reach statistical significance (both  $F$ s  $< 3.00$ ). Contrast analyses of coders' ratings of how effective, how realistic, and how difficult it was to carry out the students' listed solutions also showed no significant differences among the

Table 1  
Means and Standard Deviations of the Responses of the Four Groups to the Problem-Solutions Task (Study 1)

Response	Group			
	Dysphoric-ruminative ( $n = 23$ )	Dysphoric-distracting ( $n = 22$ )	Nondysphoric-ruminative ( $n = 22$ )	Nondysphoric-distracting ( $n = 23$ )
Judgments of problems				
Severity				
<i>M</i>	5.65	4.54	4.54	5.09
<i>SD</i>	1.50	1.37	1.44	1.28
Solvability				
<i>M</i>	3.87	4.86	5.50	5.48
<i>SD</i>	1.52	1.55	1.41	1.38
Judgments of solutions				
Confidence in effectiveness				
<i>M</i>	5.00	4.92	5.23	5.68
<i>SD</i>	1.10	1.39	1.47	1.33
Likelihood of working if carried out				
<i>M</i>	5.06	4.62	5.35	5.75
<i>SD</i>	1.04	1.10	1.13	0.91
Likelihood of implementing				
<i>M</i>	3.46	4.33	4.26	4.99
<i>SD</i>	1.06	1.11	1.55	1.42

four groups (all  $F_s < 2.00$ ). Furthermore, it is notable that no significant difference was found between dysphoric ruminators and the other three groups in their reported difficulty of generating solutions ( $F < 1.00$ ). Omnibus one-way analyses of variance for all the above variables similarly showed no significant differences among groups.

Our second, alternative set of hypotheses led us to predict that dysphoric students who were made to ruminate would rate themselves as least likely of the four groups to actually use or implement their solutions to their problems, despite the fact that they are equally confident in the effectiveness of these solutions. This prediction was indeed confirmed. The results of planned contrasts revealed that the dysphoric-ruminative group rated themselves as significantly lower than the other three groups,  $F(1, 86) = 11.42$ ,  $p < .002$ , and significantly lower than the dysphoric-distracting group,  $F(1, 86) = 5.03$ ,  $p < .03$ , in likelihood to implement their solutions to the first and biggest problem (see top of Figure 1 and Table 1). Furthermore, there was no significant difference between the dysphoric-distracting group and the two nondysphoric groups ( $F < 1.00$ ).

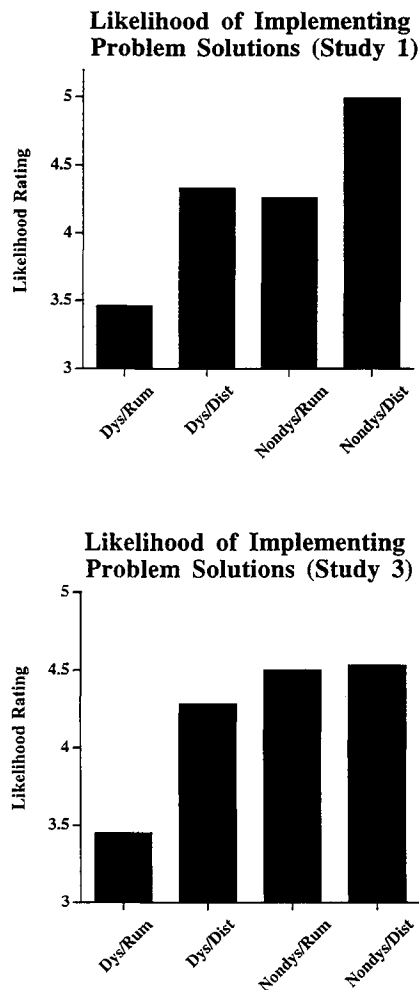


Figure 1. Mean ratings of likelihood of implementing problem solutions (Study 1 and Study 3). Dys = dysphoric; Rum = ruminative; Dist = distracting; Nondys = nondysphoric.

## Discussion

As predicted by both response-style theory (Nolen-Hoeksema, 1991) and social-cognitive theory (Bandura, 1986), dysphoric students who ruminated rated their problems as more severe and less solvable than dysphoric students who distracted from their mood or than either of the nondysphoric groups. Independent judges, however, did not regard the problems generated by the dysphoric ruminators as any worse than those of the other participants. Previous research has shown that self-focus and rumination in the presence of a depressed mood is associated with more pessimistic thinking than is externally focused distraction (Fennell & Teasdale, 1984; Lyubomirsky et al., 1998, 1999; Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-Hoeksema, 1991; Pyszczynski et al., 1987, 1989). By drawing one's attention to one's dysphoria and depressive symptoms, ruminative responses may activate a network of negatively biased thoughts, memories, and schemas, thus negatively "coloring" one's judgment. Our findings supported this assertion, suggesting that rumination in combination with dysphoria may influence the way people interpret their problems, leading them to perceive their problems as more overwhelming and impossible to solve than they really are. Inoculated against this negative bias through a short-term distraction, dysphoric individuals who directed their attention externally perceived their problems no differently from nondysphorics. Also immune to the bias were the neutral and disinterested judges, who were not able to discern any differences among the severity or solvability of the problems generated by any of the groups.

Disconfirming our first set of hypotheses, dysphoric students who ruminated were no less confident in the solutions they generated to their problems, and they believed these solutions to be no less effective than the other three groups in this study. Why did dysphoric rumination not negatively color people's judgments of confidence in their solutions (cf. Lyubomirsky & Nolen-Hoeksema, 1995)? A strong possibility is that the solutions that our participants provided were, for the most part, clear and straightforward. If the students were having academic difficulties (the most common problem cited by far), they exhorted themselves to study harder, obtain a tutor, or watch less television. If they were experiencing financial difficulties, they prescribed finding a new part-time job or asking for a loan. Even a depressed mood combined with rumination is not likely to lead a person to devalue such apparently obvious solutions (especially ones that he or she is likely to have contemplated prior to our study)—much like in a previous experiment, dysphoric rumination did not lead participants to distort their judgments of whether a variety of pleasant activities would be likely to lift their mood (Lyubomirsky & Nolen-Hoeksema, 1993). Additionally, our experimental instructions, which forced students to list their problems and solutions in an organized, coherent manner and to assess them on separate dimensions, may have provided a structure and logic to our dysphoric participants' thinking that may not have normally existed.

These explanations also shed light on why dysphoric students who were induced to ruminate did not show impaired problem-solving skills—that is, why independent judges rated the solutions provided by the four groups as approximately equally effective, realistic, and easy to implement. However, the possibility remains that if our participants had described their problem-solving plans in greater detail, judges may have been able to discern problem-

solving deficits in dysphoric ruminators, as they had done for a more complex problem-solving task in a previous study (Lyubomirsky & Nolen-Hoeksema, 1995). In that study, students' descriptions of solutions in response to the Means-Ends Problem-Solving Procedure (MEPS) averaged close to a page (compared with a single line in our problem solutions task). Furthermore, the problems presented to these participants had been hypothetical and intentionally ambiguous (e.g., "a phone message suggests that your (boy)girlfriend may be angry with you"), yielding no simple, straightforward answers. To test these ideas, as well as to confirm that our null result with respect to problem-solving effectiveness in this study was not merely a failure to replicate, both the current problem solutions task and the MEPS was presented to participants in a subsequent study (Study 3).

All told, our findings from the current study leave us with a small paradox: If dysphoric ruminators are able to come up with solutions to their problems that they (as well as objective coders) judge as effective and likely to succeed, then why do they lack confidence in their likelihood of solving or alleviating these problems? The answer lies in our final set of findings, which supported our second, alternative set of hypotheses. Dysphoric students induced to ruminate rated themselves as less likely to actually use their listed solutions to solve their problems than did the other three groups. Although solutions such as "study harder" or "find a new job" may be straightforward, their execution requires energy and effort. Self-focused rumination, in the presence of a depressed mood, appears to deplete one's motivation and initiative, thus lowering one's efficacy expectations (cf. Bandura, 1986) and reducing the likelihood that one will carry out solutions to problems, even when one knows that these solutions will work. Supporting this notion, a previous study found that although dysphoric ruminators acknowledged that simple, fun activities would improve their mood, they were unwilling to do them (Lyubomirsky & Nolen-Hoeksema, 1993; see also Wenzlaff et al., 1988).

How does dysphoric, self-focused rumination sap one's motivation? Although previous studies have focused on rumination's adverse effects through the mechanism of enhanced negative mood (Lyubomirsky et al., 1998, 1999; Lyubomirsky & Nolen-Hoeksema, 1993, 1995; Nolen-Hoeksema, 1991; see also Carver & Scheier, 1990; Ingram, 1990; Musson & Alloy, 1988; Pyszczynski & Greenberg, 1987), other aspects of dysphoric rumination that may influence thinking and problem solving have yet to be examined. For example, is there anything about the content and quality of ruminative thinking itself (as opposed to distraction) that may lead dysphoric people to feel that they will not or cannot tackle their problems? In Studies 2 and 3, we attempted to observe, as closely as experimental methodology permits, the actual thoughts that compose naturalistic dysphoric rumination. Following previous research, we hypothesized that these thoughts would be generally pessimistic and negatively biased; however, no other predictions were made about their specific content.

## Study 2: Part 1

### Method

#### Overview

Dysphoric and nondysphoric students expressed their thoughts out loud into a microphone in response to instructions that were either ruminative

(self-focused and emotion-focused) or distracting (externally focused). Two independent judges scored the transcripts of participants' audiotaped responses on the following global dimensions: negativity of tone, problem-focus, self-criticism, self-blame for problems, self-confidence, optimism, and general perceived control. Participants completed measures of depressed mood before and after the manipulation.

#### Participants and Procedure

Forty students enrolled in introductory psychology at the University of California, Riverside (22 women and 18 men), received course credit for their participation in this study. As in Study 1, potential participants completed the BDI as part of a larger set of unrelated questionnaires. Students with BDI scores of 12 and above were classified as dysphoric (10 women and 10 men), and students with BDI scores of 4 and below were classified as nondysphoric (12 women and 8 men). All students participated within 1 month after completing the BDI. The procedure was similar to that used in Study 1, except that participants completed only the mood assessments and the response-manipulation tasks, which were performed out loud. The entire study lasted approximately 45 min.

#### Materials

*Mood questionnaires.* As in Study 1, participants completed two packets of mood questionnaires during the experiment, as well as a number of filler scales.

*Response-manipulation, "think-out-loud" tasks.* The response-manipulation tasks used in Study 1 were modified into a think-out-loud procedure in which participants were instructed to speak their thoughts out loud in response to items that were either ruminative or distracting. This task was described as one in which "you must use your ability to visualize, concentrate, and verbalize, focusing your mind and thinking out loud about a series of ideas and images." Participants were informed that their responses would be audio-recorded and confidential. To familiarize the students with this procedure, a 2-min warm-up phase was conducted, in which students talked out loud into a microphone about the day's events. After this warm-up phase, participants were instructed to begin the think-out-loud task. As in the original procedure, after the experimenter left the room, everyone spent exactly 8 min on this task.

Students' audiotaped responses during the think-out-loud procedure were subsequently transcribed, and the transcripts were scored by two judges unaware of participants' dysphoria status and manipulation condition. The judges were instructed to consider the entire transcript when making their ratings. Each student's response was given 11 global ratings, all on 7-point Likert scales (1 = *not at all*; 4 = *some*; 7 = *very much*). Five ratings were averaged and combined into a general Negativity of Tone score, namely, the amount of (a) overall negativity, (b) overall positivity, (c) depression (i.e., how depressed, sad, or down was the response), (d) happiness (i.e., how happy, cheerful, or elated was the response), and (e) anxiety (i.e., how nervous or tense was the response). Responses were also rated for the amount of Problem Focus (e.g., dwelling on one's personal problems), Self-Criticism (e.g., self-reproach, belittling self), Self-Blame for problems (i.e., stating that one deserves them or that problems are one's own fault), Self-Confidence (e.g., self-praise or references to personal achievements), Optimism (e.g., looking forward to or showing enthusiasm about a future positive event), and General Control (i.e., amount of perceived control over one's problems and life outcomes, such as taking credit for success or proposing to change one's situation).

The two judges were extensively trained to score the transcripts on these seven dimensions (11 ratings total). In addition, they were instructed to read the transcripts several times to ensure that their codings were appropriate and accurate. Intraclass correlation coefficients revealed that interrater reliability was very good, ranging from .82 to .92 ( $M = .87$ ).

### Results

Because there were no main effects or interactions with sex, all analyses were conducted by collapsing our data over sex of students. Statistical analyses followed the procedures used in Study 1. In addition, because we were assessing ideas and images that were naturally entirely different depending on whether rumination or distraction was induced (i.e., thoughts about oneself and one's feelings vs. thoughts about external objects and scenes, respectively), we naturally expected that the expressed thoughts of dysphorics who distracted would differ from those of dysphorics who ruminated but that they would not differ from those of the two nondysphoric groups.<sup>2</sup> More important, however, as in Study 1, we further hypothesized that dysphoric and nondysphoric students would differ in their responses to ruminative instructions. Thus, in summary, we conducted planned pairwise comparisons between the dysphoric-ruminative group and the nondysphoric-ruminative group, as well as between the dysphoric-distracting group and each of the other three groups.

#### Mood-Manipulation Check

At the beginning of the study, participants in the dysphoric group were more depressed ( $M = 4.22$ ,  $SD = 2.02$ ) than participants in the nondysphoric group ( $M = 2.20$ ,  $SD = 1.79$ ),  $t(37) = 3.35$ ,  $p < .002$ . The results of a pairwise comparison on changes in depressed mood between dysphoric participants in the rumination and the distraction conditions revealed a significant difference between the two groups, showing that dysphorics who ruminated became more depressed ( $M = 1.05$ ,  $SD = 2.39$ ) and dysphorics who distracted became less depressed ( $M = -0.70$ ,  $SD = 0.79$ ),  $F(1, 36) = 8.14$ ,  $p < .008$ . In contrast, no significant difference was found in changes in depressed mood between nondysphoric ruminators ( $M = 0.15$ ,  $SD = 0.58$ ) and nondysphoric distractors ( $M = -0.40$ ,  $SD = 0.94$ ),  $F < 1.00$ , *ns*.

Furthermore, the results of planned contrasts showed that, after the response-manipulation task, dysphoric participants who ruminated exhibited significantly higher levels of dysphoria compared with dysphoric participants who distracted,  $F(1, 36) = 7.43$ ,  $p < .01$ , as well as compared with the remaining three groups,  $F(1, 36) = 21.99$ ,  $p < .0001$ . Mean levels of depressed mood following the response-manipulation task were as follows: dysphoric-ruminative,  $M = 5.45$ ,  $SD = 1.23$ ; dysphoric-distracting,  $M = 3.35$ ,  $SD = 1.75$ ; nondysphoric-ruminative,  $M = 2.55$ ,  $SD = 2.53$ ; and nondysphoric-distracting,  $M = 1.60$ ,  $SD = 0.94$ .

#### Expressed Thoughts

**Negative tone.** The results of a planned contrast confirmed our hypothesis that the expressed thoughts of participants in the dysphoric-ruminative group would be rated as significantly more negative in tone than those of the remaining three groups,  $F(1, 36) = 53.50$ ,  $p < .0001$  (see top of Figure 2). In addition, according to a pairwise comparison, the thoughts of dysphoric ruminators were rated as significantly more negative than those of nondysphoric ruminators,  $F(1, 36) = 30.05$ ,  $p < .0001$ . As predicted, results of pairwise comparisons also suggested that the thoughts of dysphoric ruminators were judged as more negative than those of dysphoric distractors,  $F(1, 36) = 33.35$ ,  $p < .0001$ ,

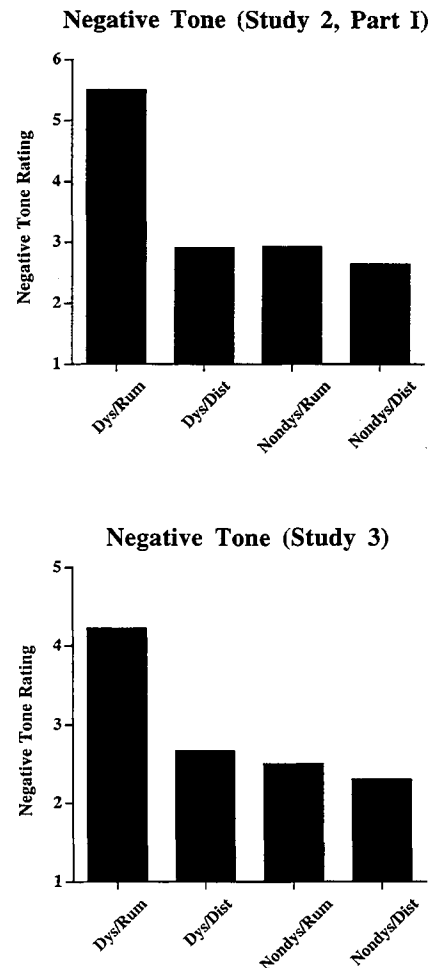


Figure 2. Mean ratings of negative tone (Study 2, Part 1 and Study 3). Dys = dysphoric; Rum = ruminative; Dist = distracting; Nondys = nondysphoric.

but that ratings of dysphoric distractors' expressed thoughts did not differ significantly from the two nondysphoric groups (both  $F$ s  $< 1.00$ ). Mean ratings of negative tone for the four groups are displayed in the first part of Table 2.

**Problem focus.** Notably, the ruminative thoughts of dysphoric participants were most likely to be characterized by references to personal problems. As shown in the bottom panel of Figure 3, the results of a planned contrast revealed that the thoughts expressed by participants in the dysphoric-ruminative group were rated as significantly more problem-focused than those of the other three groups,  $F(1, 36) = 16.94$ ,  $p < .0002$ , and, specifically, as significantly more problem-focused than those of the dysphoric-distracting group,  $F(1, 36) = 21.86$ ,  $p < .0001$  (see also Table 2). The difference between dysphorics and nondysphorics who rumi-

<sup>2</sup> The prediction that the expressed thoughts of dysphoric students who distracted themselves for 8 min would not differ from those of nondysphoric students who distracted is important in itself, suggesting that short-term distraction is an effective strategy for attenuating the negative content of one's thoughts.



Table 2  
*Mean Ratings and Standard Deviations of Thoughts Expressed by the Four Groups in Transcripts (Study 2, Part 1) and Audiotapes (Study 2, Part 2)*

Expressed thought	Group			
	Dysphoric-ruminative (n = 10)	Dysphoric-distracting (n = 10)	Nondysphoric-ruminative (n = 10)	Nondysphoric-distracting (n = 10)
Transcripts				
Negative tone	4.76 (0.98)	2.53 (0.65)	2.64 (0.95)	2.19 (0.83)
Problem focus	5.10 (1.59)	1.90 (0.88)	4.00 (1.94)	2.50 (1.51)
Self-criticism	4.30 (1.64)	1.30 (0.48)	2.10 (1.45)	1.00 (0.00)
Self-blame for problems	4.50 (1.43)	2.30 (1.57)	2.20 (1.32)	1.10 (0.32)
Self-confidence	2.50 (1.58)	4.38 (1.41)	4.90 (1.45)	5.71 (0.76)
Optimism	3.90 (1.73)	5.25 (0.89)	5.20 (0.79)	5.57 (0.98)
Control	2.90 (1.91)	4.44 (1.67)	5.60 (1.65)	4.90 (1.37)
Audiotapes				
Negative tone	5.50 (0.86)	2.90 (1.19)	2.92 (1.42)	2.64 (1.08)
Problem focus	6.20 (1.03)	1.50 (0.97)	3.60 (2.32)	2.33 (1.41)
Self-criticism	4.90 (2.23)	1.00 (0.00)	2.10 (1.59)	1.10 (0.31)
Self-blame for problems	4.00 (2.06)	1.30 (0.48)	2.20 (1.69)	1.20 (0.42)
Self-confidence	2.40 (1.56)	3.78 (1.64)	5.00 (1.33)	4.78 (0.97)
Optimism	2.50 (1.18)	4.00 (1.49)	5.40 (1.58)	4.00 (1.41)
Control	2.90 (1.52)	5.57 (0.53)	4.80 (1.40)	5.50 (0.84)

Note. Standard deviations are in parentheses.

nated failed to reach statistical significance ( $F < 3.00$ ). As predicted, pairwise comparisons further showed that the thoughts of dysphoric students made to distract were not rated as more or less problem-focused than those of nondysphoric students made to distract ( $F < 3.00$ ). However, the difference between ratings of expressed thoughts of the dysphoric-distracting participants and the nondysphoric-ruminating participants was statistically significant,  $F(1, 36) = 9.42, p < .005$ .

*Self-criticism and self-blame for problems.* Dysphoric rumination led our participants to put themselves down more and blame themselves more for their problems. The results of planned contrasts showed that the expressed thoughts of the dysphoric-ruminative group were rated as reflecting significantly more self-criticism,  $F(1, 36) = 48.06, p < .0001$ , and more self-blame,  $F(1, 36) = 32.79, p < .0001$ , than those of the other three groups (see top panels of Figure 3). As predicted, according to the results of pairwise comparisons, dysphoric ruminators' thoughts were judged as reflecting significantly more self-criticism,  $F(1, 36) = 19.32, p < .0001$ , and self-blame for problems,  $F(1, 36) = 16.68, p < .0002$ , than those of nondysphoric ruminators; dysphoric ruminators' thoughts were also judged as reflecting significantly more self-criticism,  $F(1, 36) = 35.92, p < .0001$ , and self-blame for problems,  $F(1, 36) = 15.26, p < .0004$ , than those of dysphoric distractors. By contrast, as expected, ratings of self-criticism for dysphoric distractors' thoughts, as expressed in the transcripts, did not differ significantly from those of the two nondysphoric groups (both  $F$ s  $< 3.00$ ). Also, as expected, ratings of self-blame for dysphoric distractors' thoughts did not differ significantly from those of nondysphoric ruminators ( $F < 1.00$ ). However, a pairwise analysis comparing the dysphoric-distracting and nondysphoric-distracting groups did attain statistical significance for ratings of self-blame,  $F(1, 36) = 4.54, p < .05$ . The

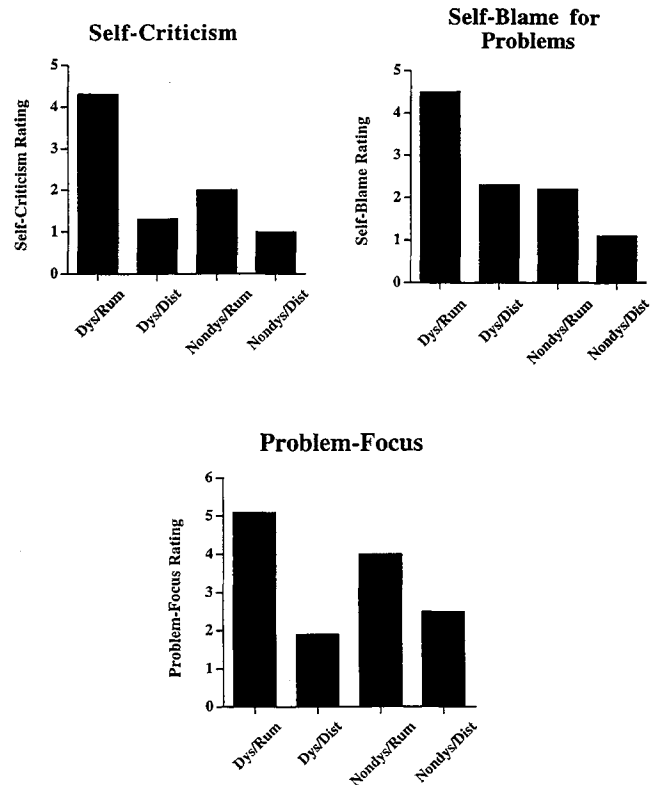


Figure 3. Mean ratings of self-criticism, self-blame for problems, and problem focus (Study 2, Part 1). Dys = dysphoric; Rum = ruminative; Dist = distracting; Nondys = nondysphoric.

means of the four groups for both variables are presented in the first part of Table 2.

**Self-confidence and optimism.** Supporting our general predictions, expressed thoughts of the dysphoric-ruminative group were characterized by significantly less self-confidence and optimism. According to the results of a planned contrast comparing the dysphoric-ruminative group with the remaining three groups, the thoughts expressed by the dysphoric ruminators were rated as reflecting significantly less self-confidence,  $F(1, 31) = 23.36, p < .0001$ , and less optimism about the future,  $F(1, 31) = 10.45, p < .003$  (see Table 2 and top panels of Figure 4). Results of a pairwise comparison revealed that the thoughts of dysphoric ruminators, as expressed in the transcripts, were rated as reflecting significantly less self-confidence,  $F(1, 31) = 15.21, p < .0005$ , and less optimism,  $F(1, 31) = 5.99, p < .03$ , than those of nondysphoric ruminators. The results of pairwise comparisons further suggested that the thoughts of dysphoric participants who ruminated were judged as less self-confident,  $F(1, 31) = 8.25, p < .008$ , and less optimistic,  $F(1, 31) = 5.74, p < .03$ , than those of dysphoric participants who distracted. As predicted, assessments of confidence and optimism as reflected in the thoughts expressed by dysphoric distractors did not significantly differ from those of the two nondysphoric groups (both  $F_s < 4.00$ ).

**Perceived general control.** According to the results of a planned contrast, the thoughts of dysphoric ruminators, as ex-

pressed in the transcripts, were judged as reflecting significantly less general perceived control than those of the other three groups,  $F(1, 29) = 26.05, p < .0001$  (see Table 2 and bottom panel of Figure 4). According to pairwise comparisons, the expressed thoughts of dysphoric students who ruminated were also rated as reflecting significantly less general control than those of nondysphorics who ruminated,  $F(1, 29) = 11.97, p < .002$ , as well as those of dysphorics who distracted,  $F(1, 29) = 19.49, p < .0001$ . As expected, no significant differences were found in the amount of control reflected in the expressed thoughts of dysphoric distractors and those of nondysphoric ruminators or nondysphoric distractors (both  $F_s < 2.00$ ).

## Study 2: Part 2

### Overview

In Part 1 of this study, transcripts of participants' responses to a ruminative or distracting task were scored instead of the actual audiotapes to reduce possible biases that might arise from recognizing participant characteristics such as gender, age, ethnicity, or annoying speech habits. Unfortunately, the transcripts also concealed from judges a number of characteristics relevant to the nature of their codings, including voice tone, speed of speech, loudness, stuttering, pauses, and other verbal cues. Thus, in Part 2, participants' original audiotaped responses were retrieved and coded on the same dimensions by a new pair of independent judges.

### Method

The participants and procedure were identical to those used in Part 1, except that participants' actual voice recordings, rather than transcripts, were scored by judges. Thus, in addition to paying attention to the content of the participants' expressed thoughts, coders were instructed to include such elements as voice tone, loudness, speed of speech, voice breaking, and other verbal cues in making their ratings on the same seven dimensions (11 ratings total) as in Part 1 of the study. Transcripts were not provided. Interclass correlation coefficients showed that interrater reliability was good to excellent, ranging from .83 to .97 ( $M = .90$ ).

### Results

#### Sex Differences

All analyses were initially performed with sex of participant as a between-subjects factor. Only one significant main effect for sex was found. The expressed thoughts of women were rated as more optimistic than those of men,  $t(30) = 2.22, p < .04$ . Mean ratings for optimism were 4.50 ( $SD = 1.47$ ) for women and 3.29 ( $SD = 1.83$ ) for men. To assess whether this sex difference affected the results of analyses comparing the four groups of interest, all analyses were initially performed with sex of participant as a third factor. Because there were no interactions between sex and dysphoria status or response-manipulation condition, all analyses reported were conducted by collapsing across sex of participant.

#### Expressed Thoughts

**Negative tone.** Replicating the findings of Part 1, the results of a planned contrast showed that the expressed thoughts of dys-

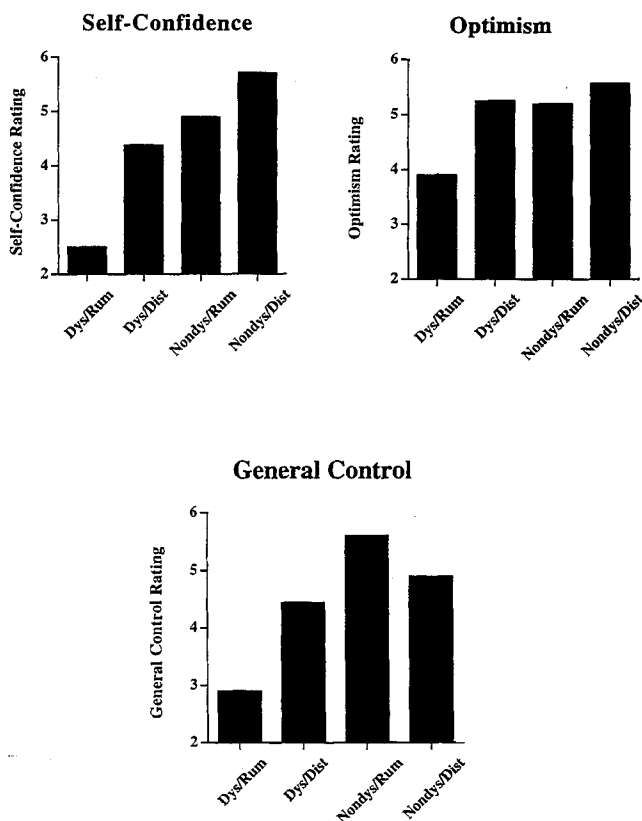


Figure 4. Mean ratings of self-confidence, optimism, and perceived general control (Study 2, Part 1). Dys = dysphoric; Rum = ruminative; Dist = distracting; Nondys = nondysphoric.

phoric ruminators, as heard on the audiotapes, were significantly more negative in tone than those of the other three groups,  $F(1, 36) = 40.29, p < .0001$ . Furthermore, the expressed thoughts of dysphorics who were induced to ruminate were rated as significantly more negative than those of nondysphorics who were induced to ruminate,  $F(1, 36) = 24.92, p < .0001$ . As expected, results of pairwise comparisons also suggested that the expressed thoughts of dysphoric ruminators were judged as more negative than those of dysphoric distractors,  $F(1, 36) = 25.21, p < .0001$ , but that ratings of dysphoric distractors' thoughts did not differ significantly from those of nondysphoric ruminators or from nondysphoric distractors (both  $F_s < 1.00$ ). Mean ratings of negative tone for the four groups are displayed in the second part of Table 2.

*Problem focus.* As found in analyses of the transcripts, examination of the audiotapes revealed that, of the four groups, the expressed thoughts of dysphoric ruminators were most likely to be focused on personal problems. According to the results of a planned contrast, participants in the dysphoric-ruminative group were judged as focusing more on their problems than participants in the other three groups,  $F(1, 35) = 43.68, p < .0001$  (see Table 2). The expressed thoughts of dysphoric ruminators were also rated as significantly more problem focused than those of nondysphoric ruminators,  $F(1, 35) = 14.34, p < .0006$ , or those of dysphoric distractors,  $F(1, 35) = 46.86, p < .0001$ . As predicted, the ratings of expressed thoughts of the dysphoric-distracting group did not significantly differ from those of the nondysphoric-distracting group ( $F < 2.00$ ). However, the difference in ratings between the dysphoric-distracting students and the nondysphoric-ruminating students was statistically significant,  $F(1, 35) = 9.35, p < .005$ .

*Self-criticism and self-blame for problems.* Supporting our hypotheses, the verbally expressed thoughts of the dysphoric-ruminative group reflected significantly more self-criticism,  $F(1, 36) = 48.14, p < .0001$ , and more self-blame for problems,  $F(1, 35) = 22.67, p < .0001$ , than those of the remaining three groups. Furthermore, dysphoric students who ruminated were rated as exhibiting more self-criticism,  $F(1, 36) = 20.54, p < .0001$ , and self-blame,  $F(1, 35) = 8.49, p < .007$ , than nondysphoric students who ruminated. As expected, the expressed thoughts of dysphoric ruminators were judged as more self-critical,  $F(1, 36) = 39.85, p < .0001$ , and self-blaming,  $F(1, 35) = 19.09, p < .0001$ , than those of dysphoric distractors. In contrast, ratings of dysphoric distractors' thoughts did not differ significantly from those of nondysphoric ruminators or from nondysphoric distractors (both  $F_s < 4.00$ ). The means of the four groups for both variables are presented in the second part of Table 2.

*Self-confidence and optimism.* As predicted, ruminative thoughts expressed in the audiotapes were characterized by reduced self-confidence and optimism. The results of planned contrasts revealed that the expressed thoughts of the dysphoric-ruminative group were rated as reflecting significantly less self-confidence,  $F(1, 34) = 16.64, p < .0003$ , and less optimism about the future,  $F(1, 35) = 14.19, p < .0006$ , than those of the other three groups (see Table 2). In addition, the thoughts of dysphoric ruminators were rated as significantly less self-confident,  $F(1, 34) = 17.02, p < .0002$ , and less optimistic about the future,  $F(1, 35) = 20.76, p < .0001$ , than those of nondysphoric ruminators. Furthermore, as predicted, pairwise comparisons showed that the expressed thoughts of dysphoric ruminators were judged as less self-confident,  $F(1, 34) = 4.53, p < .04$ , and less optimistic,  $F(1,$

$35) = 5.55, p < .03$ , than those of dysphoric distractors. However, as expected, the thoughts of dysphoric distractors did not significantly differ from those of either of the nondysphoric groups (both  $F_s < 4.00$ ).

*Perceived general control.* Replicating the results of Part 1, students in the dysphoric-ruminative group verbally expressed thoughts that were rated as significantly lower in perceived general control than those of the remaining three groups,  $F(1, 35) = 11.69, p < .002$  (see Table 2). The expressed thoughts of dysphoric ruminators were also judged as reflecting less control than those of nondysphoric ruminators,  $F(1, 35) = 13.23, p < .0009$ , or those of dysphoric distractors,  $F(1, 35) = 4.10, p < .05$ . In addition, as expected, dysphoric distractors' thoughts did not significantly differ in amount of control from those of the nondysphoric groups (both  $F_s < 3.00$ ).

## Discussion

A number of laboratory experiments have now examined the consequences of dysphoric rumination versus distraction for cognition, affect, and behavior (e.g., Butler & Nolen-Hoeksema, 1994; Davis & Nolen-Hoeksema, 1999; Lyubomirsky et al., 1998, 1999; Lyubomirsky & Nolen-Hoeksema, 1993, 1995; Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema & Morrow, 1993a; Rusting & Nolen-Hoeksema, 1997). But what exactly do dysphoric individuals do in the process of rumination? The results of both parts of Study 2 suggest that ruminative thought in the presence of a depressed mood is characterized by a dangerous combination of negative, depressogenic thinking with a focus on personal problems. Ratings of both transcripts and audiotapes revealed that self-focused rumination led dysphoric students to mull over their most troubling problems, such as decreasing grades or conflicts with friends and family members. At the same time, as predicted, dysphoric ruminators were inclined to be negative, self-critical, and likely to blame themselves for these problems (e.g., thinking "I'm lazy" or "I've never been very popular"); in addition, they showed reduced self-confidence and optimism (e.g., "My grades aren't likely to improve") and diminished feelings of control ("I'm pretty much lost when it comes to my parents"). By contrast, the ruminative thoughts of nondysphorics, as well as the expressed thoughts of both dysphoric and nondysphoric students who distracted, were judged as significantly more positive, optimistic, and less problem focused.

These findings support several self-focus and rumination theories, which argue that self-focused rumination is associated with more negative thinking among dysphoric individuals than externally focused distraction (Carver & Scheier, 1990; Ingram, 1990; Lewinsohn et al., 1985; Nolen-Hoeksema, 1991; Pyszczynski & Greenberg, 1987). Further support is provided by the significant differences found between the thoughts expressed by dysphoric ruminators and those expressed by nondysphoric ruminators. Although both dysphoric and nondysphoric students were induced to think about themselves and their feelings, only the dysphorics exhibited pessimistic, depressogenic thinking (as well as negative

moods), suggesting that rumination may only be dangerous in the context of a depressed mood.<sup>3</sup>

Our examination of what composes ruminative thought also provides suggestive evidence for how rumination in the presence of a depressed mood may reduce people's motivation to carry out solutions to their problems. Notably, our findings from Study 2 indicate that dysphoric individuals may be trying to problem solve during the very act of rumination. Combined with distorted and negatively biased thinking—plagued with self-blame, pessimism, self-criticism, and so forth—this focus on problems may impair dysphoric ruminators' problem-solving skills. For example, they might come to perceive their problems as unmanageable or overwhelming, or feel that they lack the energy, resources, or ability to take clearly needed steps to implement solutions. Meanwhile, as part of a vicious cycle, the resulting exacerbated negative mood can work to further erode motivation, as well as optimism, confidence, or perceived control. However, the direct link between the content of dysphoric rumination and problem-solving motivation remains untested. To this end, we conducted a third study, which included both the problem-solutions task of Study 1 and the think-out-loud procedure of Study 2. In addition, as noted earlier, participants completed the hypothetical problem-solving task (i.e., MEPS) used by Lyubomirsky and Nolen-Hoeksema (1995). Study 3 was motivated by three goals: first, to replicate the findings of Studies 1 and 2; second, to explore the source of Study 1's null finding regarding the judged effectiveness of participants' solutions; and, finally, to test exactly which negatively biased elements of dysphoric-ruminative thought are related to unwillingness to carry out personal solutions, as well as to poor hypothetical problem solving.

### Study 3

#### Method

##### Overview

Dysphoric and nondysphoric participants expressed their thoughts out loud in response to ruminative or distracting instructions. Two independent judges scored the audiotaped responses on the same global dimensions used in Study 2, as well as two additional ones: feeling-focus and constructive problem solving. Participants then completed the problem-solutions task and the MEPS. Two different pairs of independent judges scored participants' responses to both tasks. Depressed mood was assessed before and after the response manipulation.

##### Participants and Procedure

Fifty-one introductory psychology students (37 women and 14 men) received course credit for their participation in this study. Potential participants completed the BDI at the beginning of the quarter. On the basis of the classification procedure used in the previous two studies, 26 dysphoric (18 women and 8 men) and 25 nondysphoric (19 women and 6 men) students participated within 1 month after completing the BDI. The procedure was identical to that used in Study 2, except that following the response-manipulation, think-out-loud task and the second mood assessment, participants completed the problem-solutions task used in Study 1, followed by the MEPS. Approximately 30 s elapsed between each task.

#### Materials

*Mood questionnaires.* As in Studies 1 and 2, participants completed two packets of mood questionnaires during the study, as well as a number of filler scales.

*Response-manipulation, think-out-loud tasks.* The same procedure was used for these tasks as in Part 2 of Study 2. However, the two independent judges scored each student's response on two additional global dimensions: the amount of feeling focus (e.g., dwelling on one's current or past moods or emotions) and constructive problem solving (e.g., listing goal-oriented steps to addressing a problem, structured planning). As in Study 2, the two judges were extensively trained to score the transcripts on all nine dimensions (13 ratings total). Intraclass correlation coefficients revealed that interrater reliability was adequate to very good, ranging from .76 to .90 ( $M = .85$ ). (Missing codes for a small number of participants on a few dimensions led to variations in degrees of freedom in statistical analyses.)

*Problem-solutions task.* As in Study 1, participants listed and rated their three largest problems and three possible solutions to each problem. Again, two raters separately scored each participant's response to this task. Agreement was good to excellent on all measures. The intraclass correlation coefficients ranged from .81 to .98 ( $M = .91$ ).

*Hypothetical problem-solving task (MEPS).* This measure of complex interpersonal problem solving, an adaptation of Platt and Spivack's (1975) procedure, had been previously used by Lyubomirsky and Nolen-Hoeksema (1995). As in the previous research, participants were presented with the beginning and ending of the following interpersonal problem situation and were asked to imagine themselves experiencing this situation (or "story"):<sup>4</sup>

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.

The students' task was to describe 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 experiencing the particular situation and to describe in writing what they would do in that situation.

Two raters, unaware of participants' dysphoria status and manipulation condition, scored each participant's response to the problem situation. Following Lyubomirsky and Nolen-Hoeksema (1995), two measures of problem-solving effectiveness were scored. First, each student's response was given a global rating of problem-solving effectiveness, on 7-point Likert scales (1 = *not at all effective*; 4 = *moderately effective*; 7 = *extremely effective*). When making this rating, raters were instructed to consider the entire set of solutions or strategies offered by students in their response. Second, we calculated the percentage of all solutions offered by students that were "model" solutions (previously compiled from eight independent judges in the Lyubomirsky & Nolen-Hoeksema, 1995, study). The model solutions (or steps) included going to see the friend in person, approaching the issue in a tactful way, and saying something to reaffirm the friendship. Examples of solutions that were not model included avoiding the friend and acting mean or insensitive toward the friend.

Agreement between the two raters was good for both of the problem-solving measures. The intraclass correlation was .85 for the percentage of model solutions and .81 for the global effectiveness rating.

<sup>3</sup> It is also important to note that the rumination and distraction inductions did not significantly alter the moods of nondysphoric students.

<sup>4</sup> Lyubomirsky and Nolen-Hoeksema (1995) found that differences between dysphoric ruminators and dysphoric distractors were strongest in students' responses to the first problem situation; in addition, no main effects or interactions were found for problem-situation type. Thus, we chose to use only one problem situation (arbitrarily selected) in this study.

Table 3  
*Mean Ratings and Standard Deviations of Audiotaped Thoughts Expressed  
 by the Four Groups (Study 3)*

Expressed thought	Group			
	Dysphoric– ruminative ( <i>n</i> = 14)	Dysphoric– distracting ( <i>n</i> = 12)	Nondysphoric– ruminative ( <i>n</i> = 12)	Nondysphoric– distracting ( <i>n</i> = 13)
Negative tone	4.22 (1.59)	2.66 (1.27)	2.50 (1.00)	2.30 (1.17)
Problem-focus	4.46 (1.66)	1.00 (0.00)	2.64 (1.29)	1.17 (0.58)
Self-criticism	4.23 (1.59)	1.25 (0.89)	2.25 (1.48)	1.08 (0.28)
Self-blame for problems	4.08 (1.71)	1.08 (0.29)	1.67 (1.16)	1.08 (0.28)
Self-confidence	4.23 (1.79)	5.71 (0.95)	5.42 (1.31)	5.91 (0.54)
Optimism	4.54 (1.61)	5.20 (1.40)	5.83 (1.27)	5.42 (1.08)
Control	2.77 (1.59)	3.82 (2.23)	5.00 (1.48)	5.08 (1.56)
Feeling focus	5.69 (0.95)	2.17 (1.11)	4.42 (2.02)	2.92 (1.93)
Constructive problem solving	2.61 (1.98)	3.46 (2.30)	3.92 (1.68)	5.25 (1.96)

Note. Standard deviations are in parentheses.

## Results and Discussion

### Overview

Because there were no main effects or interactions with sex or question order, all analyses collapsed across these variables.<sup>5</sup> Statistical analyses of responses to the two problem tasks and the think-out-loud task followed the procedures used in Studies 1 and 2, respectively.

### Mood-Manipulation Check

At the outset of the study, dysphoric students reported greater dysphoria ( $M = 4.56$ ,  $SD = 1.31$ ) than nondysphoric ones ( $M = 1.76$ ,  $SD = 1.27$ ),  $t(48) = 7.76$ ,  $p < .0001$ . Furthermore, dysphorics who were instructed to ruminate became more dysphoric ( $M = 0.61$ ,  $SD = 1.53$ ), and dysphorics who were instructed to distract became less dysphoric ( $M = -0.67$ ,  $SD = 0.78$ ),  $F(1, 47) = 10.27$ ,  $p < .003$ . By contrast, no differences in mood changes were found between nondysphorics who ruminated ( $M = -0.04$ ,  $SD = 0.66$ ) and those who distracted ( $M = 0$ ,  $SD = 0.71$ ),  $F < 1.00$ , *ns*. Planned contrasts further revealed that dysphoric ruminators had significantly higher levels of dysphoria after the response-manipulation task than dysphoric distractors,  $F(1, 47) = 9.68$ ,  $p < .004$ , or than the other three groups as a whole,  $F(1, 47) = 42.17$ ,  $p < .0001$ . Mean levels of depressed mood following the response-manipulation task were as follows: Dysphoric–ruminative,  $M = 5.43$ ,  $SD = 1.74$ ; dysphoric–distracting,  $M = 3.58$ ,  $SD = 1.47$ ; nondysphoric–ruminative,  $M = 1.79$ ,  $SD = 1.38$ ; and nondysphoric–distracting,  $M = 1.69$ ,  $SD = 1.36$ .

### Expressed Thoughts

**Negative tone.** Replicating Study 2's findings, the results of a planned contrast showed that the expressed thoughts of dysphoric ruminators, as heard on the audiotapes, were rated as significantly more negative in tone than those of the other three groups,  $F(1, 46) = 17.45$ ,  $p < .0001$  (see bottom of Figure 2 and Table 3). Furthermore, according to a pairwise comparison, the expressed

thoughts of dysphorics who were induced to ruminate were rated as significantly more negative than those of nondysphorics who were induced to ruminate,  $F(1, 46) = 11.15$ ,  $p < .002$ . Results of pairwise comparisons also suggested that the expressed thoughts of dysphoric ruminators were judged as more negative than those of dysphoric distractors,  $F(1, 46) = 9.15$ ,  $p < .004$ , but that ratings of dysphoric distractors' thoughts did not differ significantly from those of nondysphoric ruminators or from nondysphoric distractors (both  $F$ s  $< 1.00$ ).

**Problem focus.** Again, as in Study 2, examination of the audiotapes revealed that, of the four groups, the expressed thoughts of dysphoric ruminators were most likely to be focused on personal problems. As reported in Table 3, participants in the dysphoric–ruminative group were judged as focusing more on personal problems than participants in the other three groups,  $F(1, 43) = 61.89$ ,  $p < .0001$ . The expressed thoughts of dysphoric ruminators were also rated as significantly more problem focused than those of nondysphoric ruminators,  $F(1, 43) = 15.97$ ,  $p < .0002$ , or those of dysphoric distractors,  $F(1, 43) = 57.44$ ,  $p < .0001$ . As predicted, the ratings of expressed thoughts of the dysphoric–distracting students did not significantly differ from those of the nondysphoric–distracting students ( $F < 1.00$ ). However, the difference in ratings between the dysphoric–distracting group and the nondysphoric–ruminating group was statistically significant,  $F(1, 43) = 11.85$ ,  $p < .002$ .

**Self-criticism and self-blame for problems.** Again, as expected, the verbally expressed thoughts of the dysphoric–ruminative group reflected significantly more self-criticism,  $F(1, 46) = 50.79$ ,  $p < .0001$ , and more self-blame for problems,  $F(1, 46) = 67.50$ ,  $p < .0001$ , than those of the remaining three groups. Furthermore, dysphoric students who ruminated were rated as exhibiting more self-criticism,  $F(1, 46) = 17.67$ ,  $p < .0001$ , and self-blame,  $F(1, 46) = 32.42$ ,  $p < .0001$ , than nondysphoric students who ruminated. Also, as expected, the expressed thoughts of dysphoric ruminators were judged as more self-critical,  $F(1,$

<sup>5</sup> These null findings are important in light of the unbalanced sex distribution of participants in this study.

46) = 40.02,  $p < .0001$ , and self-blaming,  $F(1, 46) = 50.02$ ,  $p < .0001$ , than those of dysphoric distractors. In contrast, ratings of dysphoric distractors' thoughts did not differ significantly from those of nondysphoric ruminators or from nondysphoric distractors (all  $F$ s  $< 4.00$ ). The means of the four groups for both variables are presented in Table 3.

*Self-confidence and optimism.* Replicating the results of Study 2, the ruminative thoughts of our dysphoric participants were characterized by reduced self-confidence and optimism. The expressed thoughts of the dysphoric-ruminative group were rated as reflecting significantly less self-confidence,  $F(1, 39) = 11.14$ ,  $p < .002$ , and less optimism about the future,  $F(1, 43) = 4.54$ ,  $p < .04$ , than those of the other three groups (see Table 3). In addition, the thoughts of dysphoric ruminators were rated as significantly less self-confident,  $F(1, 39) = 5.22$ ,  $p < .03$ , and less optimistic about the future,  $F(1, 43) = 5.67$ ,  $p < .03$ , than those of nondysphoric ruminators. Furthermore, as predicted, pairwise comparisons showed that the expressed thoughts of dysphoric ruminators were judged as less self-confident,  $F(1, 39) = 5.96$ ,  $p < .02$ , than those of dysphoric distractors but this difference failed to reach statistical significance in the case of ratings of optimism ( $F < 4.00$ ). However, as expected, the thoughts of dysphoric distractors did not significantly differ from those of either of the nondysphoric groups (all  $F$ s  $< 2.00$ ).

*Perceived general control.* As expected, on the basis of the results of Study 2, students in the dysphoric-ruminative group expressed thoughts that were rated as significantly lower in perceived general control than those of the remaining three groups,  $F(1, 43) = 10.91$ ,  $p < .002$  (see Table 3). The expressed thoughts of dysphoric ruminators were also judged as reflecting less control than those of nondysphoric ruminators,  $F(1, 43) = 9.89$ ,  $p < .003$ ; however, the difference between dysphoric ruminators and dysphoric distractors failed to reach statistical significance ( $F < 4.00$ ). Finally, as expected, dysphoric distractors' thoughts did not significantly differ in amount of control from those of the two nondysphoric groups (both  $F$ s  $< 3.00$ ).

*Feeling focus and constructive problem solving.* Ratings made by our judges of two new dimensions yielded a similar pattern of results. Not surprisingly, of the four groups, the thoughts of dysphoric students who had ruminated were rated as most likely to be focused on feelings,  $F(1, 46) = 24.65$ ,  $p < .0001$  (see Table 3). Further supporting this pattern was the expressed thoughts of dysphoric ruminators who were judged as more feeling focused than those of nondysphoric ruminators,  $F(1, 46) = 4.09$ ,  $p < .05$ , or those of dysphoric distractors,  $F(1, 46) = 31.22$ ,  $p < .0001$ . In addition, dysphoric distractors' thoughts did not significantly differ from those of nondysphoric distractors ( $F < 2.00$ ), but did differ from those of nondysphoric ruminators,  $F(1, 46) = 12.23$ ,  $p < .002$ . It is notable, however, that although instructions for the ruminative task prompted our participants to focus on their emotions (e.g., "Think about what your feelings might mean"), those participants who were already dysphoric deliberated on their feelings significantly more than those who were not. This finding provides evidence for the self-perpetuating cycle involving rumination, depressed mood, and negative thinking.

Interestingly, the expressed thoughts of the dysphoric-ruminative group were also rated as containing less planful, constructive problem solving than those of the remaining three groups,  $F(1, 44) = 6.11$ ,  $p < .02$  (see Table 3). Pairwise contrasts com-

paring the amount of constructive problem solving in the thoughts of dysphoric ruminators with those of nondysphoric ruminators, as well as dysphoric distractors, revealed a similar, yet nonsignificant, pattern (both  $F$ s  $< 3.00$ ). However, as expected, dysphoric distractors' thoughts did not significantly differ from those of nondysphoric ruminators ( $F < 1.00$ ) but did differ from those of nondysphoric distractors,  $F(1, 44) = 4.71$ ,  $p < .04$ . Because codings of this dimension showed the lowest interrater agreement, as well as a relatively weaker pattern of results, we should interpret these findings with some caution. Nevertheless, the findings corroborate previous research on problem-solving effectiveness (Lyubomirsky & Nolen-Hoeksema, 1995).

In summary, these findings successfully replicated those of Study 2, bolstering our confidence in the link between dysphoric rumination, problem focusing, and negative thoughts, as well as in the reliability of the think-out-loud procedure. Furthermore, the patterns of results observed for our two new coded dimensions validate, in part, our definition of dysphoric rumination.

### *Responses to the Problem-Solutions Task*

*Ratings of problem severity and solvability.* Partially replicating our findings from Study 1, the results of planned contrasts revealed that dysphoric ruminators rated their own biggest problem as significantly more severe,  $F(1, 46) = 7.89$ ,  $p < .008$ , than the remaining three groups. Although a similar trend was evident, dysphorics who ruminated did not rate their problem as significantly less solvable than the other three groups ( $F < 2.00$ ). Likewise, differences between dysphoric ruminators and dysphoric distractors reached statistical significance for ratings of problem severity,  $F(1, 46) = 8.02$ ,  $p < .007$ , but not for ratings of problem solvability ( $F < 1.00$ ). Furthermore, as expected, the dysphoric-distracting group did not significantly differ in ratings of severity or solvability of the first problem from the two nondysphoric groups (both  $F$ s  $< 1.00$ ). Mean ratings for severity and solvability are shown in Table 4.

As in Study 1, independent coders again failed to detect differences in the severity and solvability of the problems generated by our four groups. The results of planned contrasts revealed that the first problem furnished by the dysphoric-ruminative group was rated slightly, but not significantly, more severe compared with that of the three remaining groups ( $F < 3.00$ ). These differences also failed to reach significance for ratings of solvability (both  $F$ s  $< 3.00$ ), and omnibus one-way analyses of variance suggested no group differences for either variable.

*Ratings of problem solutions.* Replicating the results of Study 1, analyses comparing dysphoric ruminators and the other three groups in their reported confidence in the effectiveness of their solutions and in the likelihood that their solutions would work if carried out showed no significant differences (both  $F$ s  $< 3.00$ ; see Table 4). Contrast analyses and omnibus one-way analyses of variance of coders' ratings of how effective, realistic, and difficult to carry out the students' listed solutions were once again revealed no significant group differences (all  $F$ s  $< 1.00$ ).

As in Study 1, dysphoric students who were instructed to ruminate were again least willing of the four groups to actually carry out solutions to their biggest personal problems,  $F(1, 46) = 7.45$ ,  $p < .009$  (see bottom of Figure 1 and Table 4). Furthermore, as expected, there was a significant difference between the

Table 4  
Means and Standard Deviations of the Responses of the Four Groups  
to the Problem-Solutions Task (Study 3)

Response	Group			
	Dysphoric-ruminative ( <i>n</i> = 14)	Dysphoric-distracting ( <i>n</i> = 12)	Nondysphoric-ruminative ( <i>n</i> = 12)	Nondysphoric-distracting ( <i>n</i> = 13)
Judgments of problems				
Severity				
<i>M</i>	5.79	4.17	4.58	4.75
<i>SD</i>	1.31	1.40	1.56	1.54
Solvability				
<i>M</i>	4.29	4.67	5.17	5.00
<i>SD</i>	1.73	1.50	1.75	1.04
Judgments of solutions				
Confidence in effectiveness				
<i>M</i>	4.45	4.31	5.61	5.19
<i>SD</i>	1.54	1.22	1.29	1.32
Likelihood of working if carried out				
<i>M</i>	4.64	4.58	5.58	5.47
<i>SD</i>	1.30	0.95	1.32	1.23
Likelihood of implementing				
<i>M</i>	3.45	4.28	4.50	4.53
<i>SD</i>	1.03	0.69	1.59	1.10

dysphoric-ruminative group and the dysphoric-distracting group,  $F(1, 46) = 4.01, p = .05$ , and there was no significant difference between the dysphoric-distracting group and the two nondysphoric groups ( $F < 1.00$ ). Once again, this replication provides further support for our hypotheses and reinforces our confidence in the pattern of results obtained in Study 1.

### Responses to the MEPS

*Overall problem-solving effectiveness.* Replicating previous research, the responses of dysphoric ruminators were rated as significantly lower in global problem-solving effectiveness than those of the remaining three groups,  $F(1, 46) = 5.63, p < .02$  (see top of Figure 5 and Table 5). In addition, as expected, the responses of dysphoric ruminators were rated as significantly less effective than those of dysphoric distractors,  $F(1, 46) = 5.19, p < .03$ , and the responses of dysphoric distractors did not significantly differ from those of nondysphoric students ( $F < 1.00$ ).

*Percentage of model solutions.* Corroborating the above finding, dysphoric ruminators offered a significantly lower percentage of model solutions than did the other three groups,  $F(1, 46) = 7.40, p < .009$  (see bottom of Figure 5 and Table 5). Furthermore, as expected, a comparison of the dysphoric-ruminative and the dysphoric-distracting group was statistically significant,  $F(1, 46) = 8.55, p < .006$ . Finally, as predicted, the dysphoric-distracting group did not significantly differ from the two nondysphoric groups in the mean percentage of model solutions offered ( $F < 2.00$ ). Interestingly, a virtually identical pattern of results was also revealed for the total number of solutions generated by our participants in response to the hypothetical problem.

The pattern of results for these two measures of interpersonal problem-solving effectiveness replicated the earlier finding that dysphoric rumination is related to poor problem solving in response to complex hypothetical problems (Lyubomirsky & Nolen-Hoeksema, 1995). Moreover, taken together, our findings that dysphoric-ruminating participants showed the least effective hypothetical problem solving of the four groups, yet did not differ in the quality of solutions they offered to their own problems, support our initial hunches regarding the source of the null effect found in Study 1—namely, that the nature of participants' solutions offered in response to our problem-solutions task was too brief and too straightforward for judges to detect group differences in effectiveness. This idea is further supported by significant correlations in this study among willingness to implement solutions and the two measures derived from the MEPS:  $r = .31, p < .01$ , for overall effectiveness, and  $r = .27, p < .03$ , for percentage of model solutions (one tailed). Provided convergent validity for all three measures, these correlations suggest that those individuals who were least willing to carry out their own solutions to their problems (even when they knew them to be good ones) were also least likely to come up with good solutions to a complex hypothetical problem.

### Correlational Analyses

As noted, our findings from the current study replicated the patterns of results from Studies 1 and 2; that is, rumination in the presence of a depressed mood was once again found to be related to negatively biased, pessimistic thought and reduced willingness to initiate constructive problem solving. In addition, we were successful at replicating the findings of an earlier study, supporting

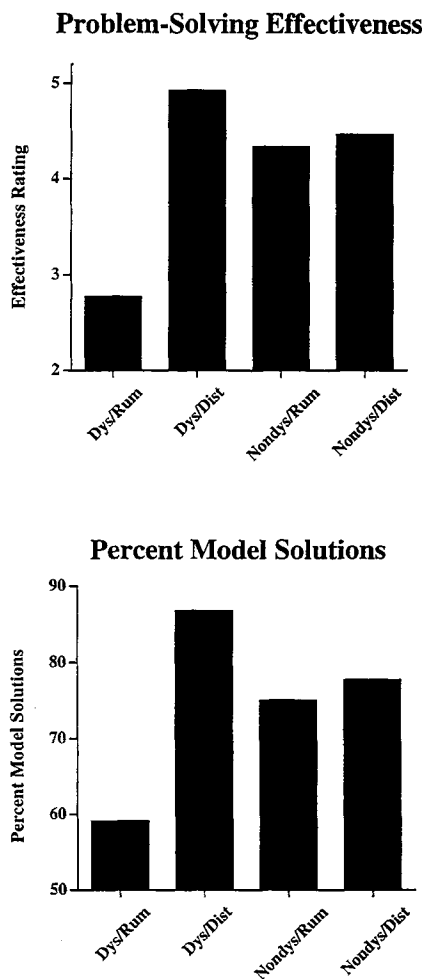


Figure 5. Mean ratings of problem-solving effectiveness and percentage of model solutions (Study 3). Dys = dysphoric; Rum = ruminative; Dist = distracting; Nondys = nondysphoric.

a link between dysphoric rumination and impaired hypothetical interpersonal problem solving. A unique feature of this study, however, is that the procedures allowed us to examine the specific relationships between measures of problem solving and measures of participants' thoughts. Consequently, we were able to test which negatively biased elements of dysphoric ruminative thought are correlated with unwillingness to carry out solutions, as well as with ineffective hypothetical problem solving. These correlations are displayed in Table 6. Reduced willingness to implement solutions to one's own problems was significantly correlated with overall negative tone of expressed thoughts; tendencies to focus on one's problems, to blame oneself for one's problems, and to manifest reduced perceptions of general control; and marginally significantly correlated with self-critical remarks. In a similar pattern of associations, both our measures of problem-solving effectiveness in response to a complex hypothetical problem were significantly (or marginally significantly) correlated with diminished negative tone, less focusing on one's problems and on one's feelings, less self-criticism, and increased self-confidence and perceived general control. The only dimensions rated by our judges that were not

significantly correlated with any of the problem-solving measures were the two that showed the weakest relationships with dysphoric rumination: optimism and constructive problem solving. However, the correlations with these codes were still in the expected direction. In summary, this pattern of correlations supports a relationship between particular types of ruminative thoughts and reduced problem-solving motivation and effectiveness.<sup>6</sup>

### General Discussion

The findings of our three studies provide clues as to why dysphoric ruminators may be poor problem solvers. In Study 1, we found that dysphoric individuals who were asked to ruminate were as likely as dysphorics who distracted themselves or as nondysphorics to report confidence in their solutions to their problems; however, they were least likely to report that they would actually implement these solutions. These results, which were replicated in Study 3, suggest that dysphoric rumination may deplete individuals' energy and motivation, thus interfering with their efforts to take clearly needed steps to solve their most compelling problems. In Study 2 (Parts 1 and 2), we examined what composes ruminations that might lead to these adverse effects. The findings revealed that dysphorics' ruminative thoughts, although initially aimed at searching for reasons for their negative mood, may inevitably direct their attention to their troubles. Dysphoric individuals who ruminated, in comparison with dysphoric individuals who distracted, were more likely to reflect repetitively on their problems, to blame themselves for those problems, and, at the same time, to express pessimism, insecurity, and diminished feelings of control. Study 3 successfully replicated these findings and additionally showed that dysphoric students were the most likely to dwell on their feelings in the course of rumination and the least likely to display good problem-solving skills immediately after rumination. Finally, Study 3 demonstrated direct links between aspects of ruminative thoughts and willingness to solve problems, as well as between that and hypothetical problem-solving skills. Taken together, the results of our three studies suggest the possibility that dysphoric individuals are attempting to solve their pressing personal problems while they are engaged in rumination. Combined with negative, pessimistic thinking and reasoning, this focus on problems can potentially handicap dysphoric ruminators' problem-solving efforts.

The depressogenic thinking that appears to go hand-in-hand with rumination may impair problem solving by interfering with one of the stages of the problem-solving process (e.g., definition or appraisal of the problem, generation of alternative solutions, selection of alternatives, and solution implementation; D'Zurilla & Goldfried, 1971). For example, because of the hypothesized vicious cycle among rumination, depressed mood, and negative thinking (Carver & Scheier, 1990; Ingram, 1990; Nolen-Hoeksema, 1991; Pyszczynski & Greenberg, 1987; Teasdale, 1983, 1985), the ruminative focus on problems that we observed in Studies 2 and 3 may lead dysphoric individuals to (a) appraise their

<sup>6</sup> Lack of statistical power precluded the computation of these correlations within the dysphoric-ruminative group only. The possibility that the associations between measures of participants' thoughts and measures of problem solving were diluted by including all four groups boosts our confidence in the strength of these findings.



Table 5  
*Mean Ratings and Standard Deviations of Complex Interpersonal Solutions (Hypothetical Problem) and Brief Solutions (Actual Problem) in Study 3*

Solution	Group			
	Dysphoric-ruminative ( <i>n</i> = 14)	Dysphoric-distracting ( <i>n</i> = 12)	Nondysphoric-ruminative ( <i>n</i> = 12)	Nondysphoric-distracting ( <i>n</i> = 13)
Interpersonal solutions (hypothetical problem)				
Overall effectiveness				
<i>M</i>	2.77	4.92	4.33	4.46
<i>SD</i>	2.17	2.50	2.71	2.02
Percentage of model solutions				
<i>M</i>	59	87	75	78
<i>SD</i>	35	13	22	18
Brief solutions (actual problem)				
Overall effectiveness				
<i>M</i>	6.02	6.00	6.31	6.56
<i>SD</i>	1.17	1.12	1.37	0.88
Realism of solutions				
<i>M</i>	6.05	5.83	6.36	6.31
<i>SD</i>	0.75	1.32	0.58	0.60
Difficulty of solutions				
<i>M</i>	4.90	4.55	4.78	5.21
<i>SD</i>	0.66	1.37	0.73	0.90

problems as overwhelming and uncontrollable, (b) fail to come up with effective problem solutions, or (c) both. The first effect, related to problem definition, was obtained in our first and third studies, in which self-focused rumination led dysphoric students to appraise their problems as severe and (in Study 1) difficult to solve. The second effect, related to the generation and selection of alternatives, was observed in Study 3, in which dysphoric ruminators generated the least globally effective solutions to a problem (see also Lyubomirsky & Nolen-Hoeksema, 1995). However, the potential damaging effects of dysphoric rumination on the last and final stage of the problem-solving process had not been previously explored. The studies reported here suggest that depressed mood

plus rumination may prevent people from actually implementing a problem solution, even if they believe it is a good one.

An understanding of the phenomenology of ruminative thought suggests a number of mechanisms by which dysphoric rumination may lower people's motivation to implement solutions to their problems. First, because they are simultaneously focusing on their problems and blaming themselves for those problems, dysphoric ruminators may be unduly pressuring themselves to alleviate their situation (i.e., "I got myself into this; now I better get myself out"), thereby elevating their stress and anxiety. The increased negative mood can further impair their motivation, initiative, and concentration, as well as exac-

Table 6  
*Pearson's Product-Moment Correlations Among Ratings of Audiotaped Thoughts, Willingness to Implement Solutions, and Interpersonal Problem-Solving Effectiveness*

Expressed thoughts	Measure		
	Willingness to implement own solutions	Overall effectiveness of hypothetical problem solutions	% hypothetical model solutions
Negative tone	-.27*	-.32*	-.33*
Problem focus	-.31*	-.38**	-.42**
Self-criticism	-.22†	-.24*	-.30*
Self-blame for problems	-.32*	-.13	-.13
Self-confidence	.12	.30*	.36*
Optimism	.19	.07	.11
Perceived general control	.33*	.31†	.40*
Feeling focus	-.16	-.22†	-.30*
Constructive problem solving	.10	.02	.16

†  $p < .10$  (marginally significant). \*  $p < .05$ . \*\*  $p < .01$  (one-tailed).

erbate their problems and heighten stress, thus maintaining a vicious cycle between dysphoria and ineffective problem solving (Billings & Moos, 1981). For example, two recent studies showed that self-focused rumination in the context of a depressed mood led to impaired concentration on important academic tasks (Lyubomirsky et al., 1999) and prevented individuals from promptly seeking help for health symptoms (Lyubomirsky & Kasri, 1999). In addition, dysphoric ruminators are likely to point to their depressive symptoms as the culprit for many, if not all, of their problems (e.g., they are failing their classes because they are unmotivated and lethargic or their friends stopped calling because they are apathetic and insecure). Focusing on such symptoms as fatigue and lack of interest may make the initial steps to solving their problems seem like overwhelming hurdles, thus inhibiting dysphoric ruminators from attempting to solve them. Supporting this notion, previous studies suggest that the symptom-focusing component of rumination is critical to the maintenance of depressed mood (Nolen-Hoeksema & Morrow, 1993b; see also Frost, Graf, & Becker, 1979; Rholes, Riskind, & Lane, 1987; Riskind, Rholes, & Eggers, 1982).

Second, while ruminating, dysphoric individuals are generally self-critical, insecure, and pessimistic (e.g., "My roommate will reject me if I complain"). Thus, they may conclude that they lack the resources, strength, or ability to carry out their problem solutions. For example, they may acknowledge that there are ways of solving their problems but think "why should I bother," because they feel that they do not have the energy to do so. However, because only self-criticism was significantly correlated with reduced willingness to implement solutions, one should be cautious in positing direct links between problem solving and these types of thoughts. The possibility remains, however, that indirect links may exist.

Finally, as shown in Studies 2 and 3, dysphoric ruminations reflect low levels of general control. Our finding that dysphoric ruminators reported low expectations for implementing their problem solutions is, thus, not very surprising. A perceived lack of control over one's problems will lead people to believe that there is nothing they can do, inhibiting them from proceeding to carry out planned solutions (cf. Peterson, Maier, & Seligman, 1993).

Self-focused rumination in the absence of dysphoria was not associated with negative thinking, problem-focusing, reduced motivation, or ineffective problem-solving, suggesting that it is the combination of rumination and depressed mood that is harmful. These findings support the claim that rumination promotes negative thinking and poor problem solving by potentiating the effects of negative mood on information processing (Nolen-Hoeksema, 1991; cf. Blaney, 1986; Bower, 1981, 1991), thus reinforcing a vicious cycle between rumination, dysphoria, and its negative consequences. Our findings also suggest that thinking about the kind of person one is or what one's feelings might mean does not have direct damaging effects on thinking, problem solving, or motivation when one is not feeling sad or depressed. In the current studies, self-focused rumination enhanced the depressed mood of dysphoric participants, whereas short-term distraction relieved it. By contrast, a rumination induction did not significantly alter the moods of nondysphorics.

### *Limitations and Future Questions*

Because the participants in our studies were probably only mildly depressed or dysphoric, we do not know if our results generalize to a clinically depressed population. In particular, it is possible that we would have found differences between dysphorics' and nondysphorics' judgments of confidence in their problem solutions if we had used clinically depressed participants. However, previous studies have shown that self-focusing manipulations maintain depressed mood, and externally focusing manipulations lift depressed mood among clinically depressed patients (Fennell & Teasdale, 1984; Gibbons et al., 1985). Still, the effects of focusing manipulations on the thinking and problem solving of clinically depressed individuals are largely unknown. This is an important area for future research.

One might argue that our think-out-loud procedure, used in Studies 2 and 3, could not closely capture naturalistic thinking. For example, internal, naturally occurring thoughts may be more disorganized, incoherent, or image based than thoughts that are expressed verbally. In addition, in spite of assured confidentiality, our participants may have felt uncomfortable or shy about sharing their private thoughts out loud. Our observations, however, indicated that almost all participants became quickly accustomed to the task during the warm-up phase and subsequently revealed highly personal and detailed thoughts and feelings, often in a stream of consciousness style. For the purposes of our studies, our method of examining verbally expressed thoughts in response to ruminative or distracting instructions was the closest we could approach "observing" rumination.<sup>7</sup> A therapist's office may be another place where dysphorics may ruminate out loud. Our studies suggest the possibility that such "coach ruminations" may provide therapists with useful information about their patients' ruminative tendencies in response to negative moods, indicating the need (or not) to teach effective distraction techniques. Future research will benefit from investigations involving alternative measures of naturalistic rumination, which might be better captured with the experience sampling method or daily diaries or audiotaped recordings.

Finally, although we were able to demonstrate the links among dysphoric rumination, measures of thinking, and measures of problem solving, we could not provide a complete test of our model of the effects of dysphoric rumination on negative thinking and the problem-solving process. Unfortunately, given the complexity of this model, existing statistical techniques, such as mediational analyses, are inappropriate. As noted earlier, we argue that self-focused rumination, in the presence of a depressed mood, triggers a vicious cycle among mood, thinking, and problem solving. The existence of a postulated bidirectional relationship between negative thoughts and low motivation (or poor problem solving) violates a critical assumption of the mediator hypothesis, namely, that the dependent variable not influence the mediating variable (Baron & Kenny, 1986). Furthermore, given that the hypothesized variables affect each other extremely rapidly in real time, and the reciprocal effects are so great, the feedback loop model that we propose is too complex to be tested with existing

<sup>7</sup> Moreover, the limitations inherent in this paradigm would only have dampened the predicted effects.

regression or latent variable models. In future research, alternative or more sophisticated technologies might be developed to capture the reciprocal influences of rumination, mood, thinking, motivation, and problem solving (e.g., by separately manipulating each variable involved in the hypothesized vicious cycle or using simultaneous real-time or reaction-time measures of these variables).

### Conclusions

When one is feeling depressed, personal problems and stresses are quite compelling and sometimes overwhelming. A spat with one's spouse or child, a crisis at work, and even a visit to the dentist can take on immensely threatening proportions. Although people who tend to ruminate may focus on themselves and the meaning of their feelings because they want to solve their most compelling problems (Carver & Scheier, 1990), our findings suggest that dysphoric rumination can actually drain their energy and motivation, thus interfering with efforts to take clearly needed steps to address or solve these very problems. Furthermore, rumination may become self-perpetuating if dysphoric individuals continue to mull over their problems and possible solutions without ever taking action to solve the problems. That is, a vicious cycle may be created, by which the problems do not disappear or, worse, are aggravated, thus maintaining or further intensifying negative mood. To break this cycle, mood-management strategies, such as the types of simple distraction techniques taught by cognitive-behavioral therapists (Alford & Beck, 1997; Beck, Rush, Shaw, & Emery, 1979; Lewinsohn, Munoz, Youngren, & Zeiss, 1986), can help lift depressed mood and divert attention from one's ruminative thoughts. Reductions in depressogenic thinking and increases in initiative, motivation, and effectiveness may not lag far behind.

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