

Dysphoric Rumination Impairs Concentration on Academic Tasks

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Three studies investigated the effects of dysphoric rumination on concentration during 3 academic tasks—reading a passage from the GRE (Study 1), watching a videotaped lecture (Study 2), and proofreading written text (Study 3). Before performing these tasks, dysphoric and nondysphoric students were induced either to ruminate about themselves or to distract themselves by focusing on neutral images (all three studies) or by planning an event (Study 1). The results supported our hypothesis that dysphoric rumination, relative to distraction, would impair students' concentration. In all 3 studies, dysphoric ruminators reported difficulty concentrating, as well as interfering thoughts, during the relevant academic tasks. Furthermore, dysphoric ruminators were slower than dysphoric distractors in completing the tasks—specifically, reading the GRE passage (Study 1) and answering lecture comprehension questions (Study 2). In addition, dysphoric participants who ruminated showed impaired reading strategies (Study 1), reduced comprehension of academic material (Study 2), and poor proofreading performance (Study 3). These findings suggest that, in addition to its documented adverse effects on mood, thinking, and problem-solving, self-focused rumination interferes with instrumental behavior. Implications for social relationships and job performance are discussed.

KEY WORDS: rumination; self-focus; distraction; dysphopia; depression; concentration.

INTRODUCTION

Although the experience of a depressed mood can be unwelcome and unpleasant, it does not always interfere with essential everyday activities, such as school, work, and household chores. However, people who respond to a depressed mood by ruminatively focusing on its meanings, causes, and consequences may find it difficult to concentrate on their academic, job, and social obligations. For example, a dysphoric student who engages in self-focused rumination may find his mind drifting to

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thoughts about what is wrong with him during an important lecture, and a ruminating dysphoric wife may find herself wondering how she will get through the next workday while reviewing her bills or making dinner. This paper reports three studies examining this phenomenon, all testing the general hypothesis that self-focused rumination in the presence of a depressed mood impairs concentration on academically relevant tasks.

Ruminative and Distracting Responses to Depressed Mood

Ruminative responses to depressed mood are thoughts and behaviors that repetitively focus the individual's attention on his or her negative feelings and the nature and implications of those feelings (Nolen-Hoeksema, 1991). Examples include isolating oneself to brood about the problems at the root of one's distress (e.g., "What if I can't arrange for childcare?") without taking action to solve those problems, or wondering why one is feeling so sad, lethargic, and hopeless (e.g., "What's wrong with me?") without actively doing anything to relieve those symptoms (Lyubomirsky & Tkach, in press; Nolen-Hoeksema, 1996). An effective alternative, by contrast, is to use pleasant or neutral distractions to alleviate one's depressive symptoms; and only then, if necessary, to undertake 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 or benign thoughts and activities that are absorbing, engaging, and capable of providing positive reinforcement (Nolen-Hoeksema, 1991; cf. Csikszentmihalyi, 1990)—for example, dining out, working out at the gym, planning a party, or completing a project at work.

Negative Consequences of Dysphoric Rumination

Many people share the assumption that when they feel depressed, they should try to focus inwardly and analyze their feelings and the consequences of those feelings in order to gain self-insight and find solutions that might ultimately resolve their problems and relieve their mood (Lyubomirsky & Nolen-Hoeksema, 1993; Papageorgiou & Wells, 2001; Watkins & Baracaia, 2001). Contrary to this belief, numerous studies over the past two decades have shown that repetitive, self-focused rumination in the presence of dysphoria is associated with a host of adverse consequences, including protracted depressed mood, enhanced negatively-biased thinking, and reduced ability to solve problems (see Nolen-Hoeksema, 1991, 1996, for reviews).

First, an increasing number of experimental and field studies have shown that people who engage in ruminative responses to dysphoria experience longer and more severe periods of depressed mood than those who use distracting responses (Fennell & Teasdale, 1984; Gibbons et al., 1985; Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998; Lyubomirsky & Nolen-Hoeksema, 1993, 1995; Lyubomirsky, Tucker, Caldwell, & Berg, 1999; Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema & Morrow, 1993; see Lyubomirsky & Tkach, in press, for a review). Interestingly, manipulations of self-focused rumination have been found not to induce depressed mood in nondysphoric individuals (Lyubomirsky et al., 1998, 1999; Lyubomirsky & Nolen-Hoeksema, 1993; 1995; Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema

& Morrow, 1993), suggesting that it is the combination of dysphoria and rumination that maintains depressed mood.

Second, dysphoric rumination has been shown to negatively bias people's thinking. Ruminative responses to depressed mood, relative to distracting ones, appear to promote negative self-evaluations (e.g., "I'm unattractive") and feelings of little control over one's life (Lyubomirsky et al., 1999), pessimistic attributions for interpersonal problems (e.g., "I always fail") and negatively-biased and distorted interpretations of life events (e.g., "I'm a loser and should have never run for office"; Lyubomirsky et al., 1999; Lyubomirsky & Nolen-Hoeksema, 1995), as well as retrieval of negative memories from one's past (e.g., "When my parents split up") and gloomy expectations about one's future (e.g., "I won't find a job after college"; Lyubomirsky et al., 1998). To account for these effects, 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; Lewinsohn, Hoberman, Teri, & Hautzinger, 1985; Lyubomirsky & Nolen-Hoeksema, 1995; Musson & Alloy, 1988; Nolen-Hoeksema, 1991; Pyszczynski, Hamilton, Herring, & Greenberg, 1989; Smith & Greenberg, 1981; Teasdale, 1983).

Finally, self-focused rumination in the presence of a depressed mood appears to interfere with interpersonal and complex problem solving. Several studies have shown that dysphoric people who ruminate about themselves and their feelings generate ineffective problem-solving strategies (Lyubomirsky & Nolen-Hoeksema, 1995; see also Brockner, 1979; Brockner & Hulton, 1978; Strack, Blaney, Ganellen, & Coyne, 1985) and show reduced motivation to carry out perfectly good solutions to their problems (Lyubomirsky et al., 1999; see also Nolen-Hoeksema & Jackson, 2000) or participate in activities that will lift their mood (Lyubomirsky & Nolen-Hoeksema, 1993). Furthermore, recent studies have found that a ruminative style is linked with reduced satisfaction and commitment to one's plans, suggesting that rumination interferes with implementation of problem solutions (Ward, Lyubomirsky, Sousa, & Nolen-Hoeksema, 2003).

The Present Studies

A decade ago, Nolen-Hoeksema (1991) anticipated much of the work reviewed here by arguing that ruminative responses to depressed mood would enhance negative thinking, impair problem solving, and maintain dysphoria. One of her hypotheses, however, has received very little attention—that is, that rumination in the context of depressed mood would also inhibit instrumental behavior (cf. Lyubomirsky & Tkach, *in press*). For example, dysphoric rumination may enhance the effects of negative mood on cognitive tasks or interpersonal behavior (e.g., by sapping motivation, inducing helplessness, or interfering with concentration). Providing preliminary support for this hypothesis, a recent study found that people with a ruminative style, relative to nonruminators, made more perseverative errors on the Wisconsin Card Sorting Test and took more time on a measure of psychomotor speed (Davis & Nolen-Hoeksema, 2000). The studies reported here extend this work to a different construct and a more widely shared experience by examining the effects of dysphoric rumination on people's levels of concentration during important academic tasks.

Moreover, because we induced rumination and distraction (rather than measuring chronic tendencies to ruminate) in dysphoric and nondysphoric individuals, it was possible to determine the direction of causality of our effects.

Our general hypothesis was that passive, self-focused rumination, *when combined with a depressed mood*, would interfere with students' concentration on a variety of tasks. Concentration was assessed during three very different, but arguably equally important, activities—that is, reading a passage (Study 1), watching a lecture (Study 2), and checking written prose for errors (Study 3). These paradigms encompass many, if not most, aspects of academic life—reading and test taking, listening to lectures and digesting material within them, and proofreading one's own and others' writing. Indeed, students' grades are primarily based on tests of knowledge acquired from their reading and the lectures they have heard, as well as on their written work. Thus, diminished concentration, engendered by dysphoric rumination, potentially has serious consequences for overall academic and work functioning (cf. Watts & Sharrock, 1985).

To achieve triangulation, concentration was measured in a number of different ways. First, respondents were asked directly to provide self-reports regarding their ability to concentrate during a particular academic task (Studies 1 and 2), as well as ratings of the extent to which they had experienced interfering thoughts (e.g., personal worries or memories from the past), as assessed by the Cognitive Interference Questionnaire (CIQ; Sarason & Stoops, 1978; Studies 1 and 3). We hypothesized that dysphoric students instructed to ruminate would report more difficulty concentrating and more frequent interfering, off-task thoughts than would dysphoric students instructed to distract or than would nondysphoric students. Second, in all three studies, we assessed participants' pace as well as performance, on the various tasks. Pace and performance served as indirect measures of concentration, as we would expect people who have more difficulty concentrating on a particular assignment to spend more time on it and, possibly, even to perform less well. In support of this argument, research on cognitive interference suggests that individuals who have many ruminations or intrusive, off-task thoughts may experience a reduced attentional capacity and subsequent decrements in performance (e.g., Mikulincer, 1989; Pierce et al., 1998; Sarason, 1984; cf. Sarason, Pierce, & Sarason, 1996). Consequently, of all the groups, dysphoric ruminators were predicted to be slowest in completing their assignments and, if the extra time did not compensate for their reduced concentration and wandering minds, to show impaired work strategies and poor performance.

In all three studies, immediately before engaging in an academic task, dysphoric and nondysphoric students were instructed either to ruminate about their feelings and personal characteristics or to distract their attention away from themselves and their moods by focusing on neutral images and scenes. Furthermore, Study 1 included a second “distraction” condition, in which students were induced to think about the steps involved in planning an elaborate event. Like rumination, such a planning exercise undoubtedly consumes cognitive resources and involves subsequent off-task thoughts. However, if dysphoric planners do not manifest the same declines in concentration and performance during subsequent tasks as dysphoric ruminators do, then we can infer that they are able to successfully arrest their chain of thoughts and focus their attention on new assignments. In contrast, we expect dysphoric rumination

to persist and, in a sense, to “contaminate” later activities. That is, unlike other types of off-task thoughts, off-task dysphoric ruminations endure even after one has been instructed to “stop” ruminating. Thus, the inclusion of the planning condition allowed us to test the alternative hypothesis that rumination impairs concentration on subsequent academic tasks merely because, by definition, it involves off-task thoughts and thus taxes cognitive capacity.

STUDY 1

Method

Overview

Dysphoric and nondysphoric students engaged in either a ruminative, distracting, or planning task and then read and answered questions about an eight-paragraph passage from the Graduate Record Examination (GRE), which was presented on a series of computer screens. The participants' progress through each segment of the reading passage was recorded by the computer. Students then completed measures of concentration and interfering thoughts. Depressed mood was assessed before and after the response manipulation task.

Participants

Ninety-one students from an Introductory Psychology class, 40 men and 51 women, received course credit for participating in this study. These students were selected on the basis of their scores on the Beck Depression Inventory (BDI; Beck, 1967), assessed in a mass-distributed questionnaire. We recruited 45 students with BDI scores of 16 and above for the dysphoric group ($M = 22.04$, $SD = 5.52$) and 46 students with BDI scores of 3 and below for the nondysphoric group ($M = 1.43$, $SD = 1.36$). Since the BDI has demonstrated excellent test-retest reliability after 2 weeks among college undergraduates (Pearson's $r = .90$; Lightfoot & Oliver, 1985), students participated within 2 weeks of assessment.

Materials

Mood Questionnaires. Participants completed two packets of mood questionnaires during the experiment—once at the beginning of the experimental session, and once after the induction of rumination or distraction. Each packet contained a questionnaire that instructed students to rate their present state, including levels of sadness and depression, on 9-point Likert scales (1 = *not at all*, 9 = *extremely*). Ratings of sadness and depression, which were correlated (.90) at both time periods, were averaged to provide a single index of depressed mood at each assessment (for similar procedures, see Lyubomirsky et al., 1998, 1999; Pittman, Orr, Forgue, & Altman, 1990; Wenzlaff, Wegner, & Klein, 1991). This mood index correlated highly with participants' preexperimental BDI scores ($r = .73$). The packet also contained filler items (i.e., levels of bashfulness, curiosity, etc.) to divert the participants' attention from our primary focus on mood. To further obscure the intent of the study, we

included several filler tasks within the packets of mood scales, such as inventories about imagining colors and recalling one's dreams.

Response Manipulation Tasks. The response manipulation tasks were designed to influence the participants' thoughts by asking them to "think about" a series of neutral items (adapted from Lyubomirsky & Nolen-Hoeksema, 1993; Morrow & Nolen-Hoeksema, 1990). Following Nolen-Hoeksema's definition of ruminative responses (Nolen-Hoeksema, 1991), the *rumination condition* required students to focus their attention on a series of 45 emotion-focused, symptom-focused, and self-focused thoughts, each presented on a separate page. For example, they were asked to think about "the physical sensations in your body at this moment," "what your feelings might mean," and "why you react the way you do." However, participants were not told specifically to think about negative emotions or negative personal attributes. By contrast, the *distraction condition* required students to focus on 45 items that were not related to emotions, symptoms, or the self. For example, they were asked to think about "a lone cactus in the desert," "the size of the Statue of Liberty," and "a parking lot at a drive-in."

Unlike previous rumination induction studies, this study included a unique new condition, in which students engaged in planning an event. To this end, the *planning condition* required students to focus on 30 items listing the steps involved in planning a fundraiser for a charity or group. For example, they were asked to think about "where [they] would hold the fundraiser," "the steps [they] need to take to secure the space [they] want," "who [they] would invite," and "what duties [they] want [their] staff to do." All the items in the rumination, distraction, and planning conditions had previously been rated as equally neutral by nondysphoric judges. In each condition, students spent exactly 8 min focusing on these items.

Reading Task. During the reading task, a passage from the GRE, adopted from a GRE practice book (Educational Testing Service, 1995), was presented on the computer. The passage was divided into eight paragraphs and each of these paragraphs was presented on a separate computer screen. Students were instructed to click on the "next" button to advance to the next screen and to click on the "previous" button to return to a previous screen. A HyperCard™ program recorded the amount of time participants spent on each screen and the number of times they switched back-and-forth through the screens. Following the reading passage, 12 surprise reading comprehension questions based on the passage were presented. The students' reading pace, the number of times they returned to previous screens, and their score on the reading comprehension questions allowed us to indirectly assess concentration during this task.

Concentration and Interfering Thoughts. Participants then completed two relatively more direct measures of concentration and interfering thoughts during the reading task. First, they were asked to report the percentage of time, from 0 to 100%, that they spent concentrating directly on the reading passage (see Strack et al., 1985, for a similar percentage measure of concentration). Next, students were instructed to complete the CIQ, a measure of off-task thoughts that are perceived as interfering with concentration (Sarason, Sarason, Keefe, Hayes, & Shearin, 1986; Sarason & Stoops, 1978). Specifically, the questionnaire asked participants to rate on 5-point Likert-type scales the frequency of 21 possible thoughts they might have had while

completing the reading task (1 = *never*, 5 = *very often*; Cronbach's $\alpha = .89$). The items either referred to the task (e.g., "I thought about how poorly I was doing," "I thought about my level of ability") or were completely task irrelevant (e.g., "I thought about something that made me feel tense").

Procedure

Each student participated individually. When participants arrived, they were told that the focus of the experiment is on "processes of imagination, visualization, and cognition in general." This cover story was used to minimize possible demand characteristics. Participants' responses on a debriefing questionnaire and their comments during oral debriefing indicated that the cover story had been successful. After instructing students to read and sign consent forms, the experimenter administered the first packet of questionnaires, which contained baseline measures of depressed mood, and left the laboratory room. In order to reduce all possible distractions, participants were instructed to flick a switch (connected to a lightbulb outside the room) to signal the experimenter when they had completed each phase of the study. The experimenter was unaware of students' dysphoria status and response manipulation condition.

After participants completed the first packet, the experimenter reentered the laboratory and introduced the response manipulation task. This procedure 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." Students were instructed to spend exactly 8 min on this task. After the allotted time, the experimenter returned and asked participants to complete the next packet of questionnaires, which contained the second set of mood scales.

During the next phase, participants were given instructions for the "reading task," which was a procedure ostensibly being pretested for a future study. They were seated in front of a computer and instructed how to use the mouse to move through the computer screens. After the initial instructions were given, participants stayed in the experimental room to perform the task. When participants finished reading the passage and answering the questions, instructions appeared on the screen to call the experimenter.

The next task consisted of a set of questionnaires, which included the measures of concentration and interfering thoughts. Next, as a manipulation check, participants were asked to recall the instructions for the response manipulation 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 time period). Finally, all participants were thoroughly debriefed. The entire study took about 1 hr.

Results and Discussion

Overview

In this study, we tested predictions about whether the dysphoric-ruminative group would differ from the other five groups (dysphoric-distracting, dysphoric-planning,

nondysphoric-ruminative, nondysphoric-distracting, and nondysphoric planning) in the negativity of their moods, reported concentration, and pace and progress through the reading task. Rosenthal and Rosnow (1985; see also Rosnow & Rosenthal, 1995) argued that the appropriate way to test such focused predictions is by planned contrasts rather than by 2-way analyses of variance. Thus, analyses using planned contrasts comparing the dysphoric-ruminative group with the other five groups were performed on all the dependent measures of interest. In addition, for a stronger test of our hypothesis, separate planned contrast analyses were conducted between dysphoric ruminators and dysphoric distractors, between dysphoric ruminators and dysphoric planners, as well as between dysphoric distractors and the three nondysphoric groups. (See Lyubomirsky et al., 1999; Lyubomirsky & Nolen-Hoeksema, 1993, 1995, for similar procedures.)

Because there were no main effects or interactions with sex, all analyses were collapsed across this variable. There were 15 participants in each of the three dysphoric groups, 16 in the nondysphoric ruminative and planning groups, and 14 in the nondysphoric-distracting group.

Changes in Mood

As expected, dysphoric students reported greater negative moods at the beginning of the experiment ($M = 5.24$, $SD = 2.10$) than nondysphoric students ($M = 1.75$, $SD = 1.18$), $t(68) = 9.76$, $p < .0001$. The results of planned pairwise comparisons on changes in depressed mood revealed that dysphorics who were instructed to ruminate became more depressed ($M = +0.80$, $SD = 1.35$), as compared to dysphorics instructed to distract ($M = -0.75$, $SD = 1.58$), $F(1, 81) = 9.29$, $p < .003$, who became less depressed, and as compared to dysphorics instructed to plan an event ($M = -1.07$, $SD = 2.75$), $F(1, 81) = 8.28$, $p < .005$, who also became less depressed. Thus, it appears that both the distraction and the planning tasks served to reduce depressed mood among already dysphoric individuals. In contrast, no significant difference was found in changes in depressed mood between nondysphorics who ruminated ($M = +0.32$, $SD = 1.35$) and those who distracted ($M = +0.18$, $SD = 0.46$) or planned an event ($M = +0.00$, $SD = 0.86$), $F < 1$, *ns*. Finally, consistent with previous research, the results of planned contrasts further showed that, after the response task manipulation, dysphoric participants who ruminated displayed significantly higher levels of depressed mood than the remaining five groups, $F(1, 81) = 60.69$, $p < .0001$, and significantly higher levels than the dysphoric distracting group, $F(1, 81) = 9.29$, $p < .004$, and the dysphoric planning group, $F(1, 81) = 8.28$, $p < .006$, in particular.

Reading Task

Because, in academic settings, test time is closely related to performance, an important indicator of performance is a student's pace while reading or completing an exam. We hypothesized that dysphoric students made to ruminate would spend the most time reading the passage than all the other participants. A planned contrast supported this hypothesis, revealing that dysphoric ruminators spent significantly

Table I. Pace and Performance on Academic Tasks (Studies 1, 2, and 3)

Rating	Group			
	Dysphoric-ruminative	Dysphoric-distracting	Nondysphoric-ruminative	Nondysphoric-distracting
Study 1				
Time spent on reading passage (min) <i>M (SD)</i>	4.16 (1.37)	3.11 (0.91)	3.31 (1.08)	2.93 (1.06)
Number of returns to previous screens <i>M (SD)</i>	0.53 (0.91)	0.07 (0.26)	0.00 (0.00)	0.07 (0.27)
Study 2				
Time spent on multiple-choice questions (s) <i>M (SD)</i>	101.81 (33.36)	79.45 (14.62)	87.10 (21.89)	88.58 (24.28)
Score on open-ended questions ^a <i>M (SD)</i>	6.04 (4.10)	7.22 (5.06)	8.80 (2.68)	7.21 (2.98)
Study 3				
Score on proofreading test <i>M (SD)</i>	8.29 (3.42)	10.41 (2.00)	10.56 (3.77)	10.62 (1.73)

Note. Means and standard deviations for the dysphoric-planning and nondysphoric-planning groups (Study 1) are provided in the text.

^aParticipants' scores on the open-ended questions (Study 2) were adjusted for time.

more time on the reading passage than did the other five groups, $F(1, 85) = 21.78$, $p < .0001$, as well as significantly longer than the dysphoric distractors, $F(1, 85) = 6.23$, $p < .02$, and the dysphoric planners, $F(1, 85) = 3.84$, $p = .05$, in particular. And, as predicted, the dysphoric-distracting group did not significantly differ in their reading pace from the three nondysphoric groups ($F < 1$). The top of Table I shows the mean number of minutes spent on the reading passage by the ruminative and distracting groups. Mean times for the two planning conditions (not shown) were as follows: dysphoric-planning $M = 3.32$, $SD = 1.43$; and nondysphoric-planning $M = 3.39$, $SD = 1.17$.

In the midst of reading a paragraph, it is not uncommon to realize suddenly that one's thoughts have wandered, concede that one has little idea of what the paragraph is about, and then proceed to read and reread the paragraph again. Not surprisingly, the more frequently this event occurs, the less efficient and effective are one's reading skills ("800score.com," 2002). We expected dysphoric students who ruminated about themselves and their emotions to show such impaired reading strategies—that is, to read parts of the GRE passage over and over. Accordingly, as exhibited in Table I, a planned contrast showed that dysphoric ruminators returned to previous screens more often than the other five groups, $F(1, 85) = 39.16$, $p < .0001$, and more often than dysphoric distractors, $F(1, 85) = 5.83$, $p < .02$, or dysphoric planners, $F(1, 85) = 9.94$, $p < .003$. In addition, dysphoric distractors were not significantly different from the three nondysphoric groups in the number of times they flipped back to previous screens ($F < 1$). Interestingly, only one nondysphoric individual returned to previous screens. Thus, because the sample distributions were not normal, these planned contrasts were conducted on rank transformed data (Marascuilo, McSweeney, & Kirk, 1977). Mean number of times students in the two planning conditions reread previous screens (not shown in Table I) were as follows: dysphoric-planning $M = 0.00$, $SD = 0.00$; and nondysphoric-planning $M = 0.00$, $SD = 0.00$.

Finally, no significant group differences were found in students' scores on the 12 multiple-choice questions about the reading passage. This finding suggests that dysphoric rumination did not impair concentration to such a point that it interfered with performance on a presumably important academic task. It should be noted, however, that the extra time that the dysphoric ruminative group spent reading the passage—about 1 min longer than the other groups—may have compensated for any difficulties in concentration, such that their reading comprehension ultimately reached the level of the other groups.

Concentration and Interfering Thoughts

Our hypothesis that self-focused rumination in the context of dysphoria would reduce reported levels of concentration was supported. As shown at the top of Table II, of the six groups, dysphoric students who ruminated reported the lowest percentage of time in which they were able to concentrate on the reading task, $F(1, 85) = 9.29$, $p < .004$. Furthermore, as expected, dysphoric ruminators reported a lower percentage of time concentrating than did dysphoric distractors, $F(1, 85) = 6.35$, $p < .02$, or dysphoric planners, $F(1, 85) = 5.14$, $p < .03$. Mean percentages for the two planning conditions (not shown in Table II) were as follows: dysphoric-planning $M = 55.33$, $SD = 20.31$; and nondysphoric-planning $M = 81.25$, $SD = 18.57$.

Finally, supporting our prediction that dysphoric rumination would increase the frequency of interfering, off-task thoughts, as measured by the CIQ, a planned contrast revealed that students in the dysphoric-ruminative group earned the highest CIQ scores of the six groups, $F(1, 85) = 33.94$, $p < .0001$ (see Table II). In addition, the CIQ scores of dysphoric ruminators were significantly higher than those of students in the dysphoric-distracting group, $F(1, 85) = 4.37$, $p < .04$, and those in the dysphoric-planning group, $F(1, 85) = 4.37$, $p < .04$. Mean CIQ scores for the planning conditions were as follows: dysphoric-planning $M = 2.11$, $SD = 0.73$; and nondysphoric-planning $M = 1.60$, $SD = 0.51$.

Table II. Self-Reported Concentration and Interfering Thoughts (Studies 1, 2, and 3)

Rating	Group			
	Dysphoric-ruminative	Dysphoric-distracting	Nondysphoric-ruminative	Nondysphoric-distracting
Study 1				
Percentage time concentrating on reading $M (SD)$	37.33 (21.20)	57.33 (22.82)	68.13 (23.16)	71.43 (24.13)
Interfering thoughts while reading (CIQ) $M (SD)$	2.64 (0.92)	2.11 (0.91)	1.82 (0.54)	1.49 (0.41)
Study 2				
Difficulty concentrating on lecture $M (SD)$	5.64 (1.60)	5.14 (2.38)	3.85 (1.82)	3.92 (1.93)
Preoccupation with other things during test $M (SD)$	5.00 (1.96)	4.43 (1.95)	3.23 (1.88)	3.46 (2.18)
Study 3				
Interfering thoughts while solving puzzles (CIQ) $M (SD)$	2.26 (0.49)	1.93 (0.37)	1.78 (0.73)	1.64 (0.56)

Note. Means and standard deviations for the dysphoric-planning and nondysphoric-planning groups (Study 1) are provided in the text. CIQ = Cognitive Interference Questionnaire.

Summary

The results of this study supported our predictions that ruminative responses to depressed mood, relative to distracting ones, would enhance negative mood, hurt self-reported concentration, and slow down students' reading pace. Importantly, we found that dysphoric individuals who ruminated were the only ones to show impaired pace and concentration. Although dysphoric planners (and, to some extent, dysphoric distractors and nondysphoric ruminators) similarly engaged in absorbing off-task thoughts during the response manipulation task, it appears that, unlike dysphoric ruminators, they were able to effectively stop these thoughts once necessity required them to perform a succeeding academic task.

Study 2, which included rumination and distraction conditions only, aimed to conceptually replicate the findings of Study 1 using a different academic task—one that undergraduates encounter nearly everyday—namely, listening and digesting material from a course lecture. Indeed, anecdotal evidence suggests that watching and listening to lectures provides ample opportunity for ruminations and interfering thoughts (see also Watts & Sharrock, 1985).

STUDY 2

Method

Overview

Dysphoric and nondysphoric participants first ruminated or distracted and then watched a 10-min videotaped academic lecture. Next, participants responded to questions on the computer regarding the lecture and reported on their levels of concentration. The computer recorded the amount of time participants spent on each lecture comprehension question. As in Study 1, depressed mood was assessed before and after the rumination or distraction task.

Participants

Fifty-four introductory psychology students, 27 men and 27 women, received credit for their participation in this study. As in Study 1, potential participants completed the BDI, assessed in a mass-distributed questionnaire earlier in the quarter. We recruited 28 students with BDI scores of 16 and above for the dysphoric group ($M = 22.39, SD = 7.50$) and 26 students with BDI scores 3 and below for the nondysphoric group ($M = 0.92, SD = 1.02$). Once again, students were invited to participate in the study within 2 weeks of completing the BDI.

Materials

Mood Questionnaires. As in the first study, two sets of mood questionnaires were administered during the experiment. Again, ratings of sadness and depression at each assessment ($r = .86$ and $.79$, respectively) were combined to provide a single index of depressed mood.

Response Manipulation Tasks. As in Study 1, students were given 8 min to think about ideas and images that were either self-focused, mood-focused, and symptom-focused (rumination condition) or externally-focused (distraction condition). A planning condition was not included.

Videotaped Lecture Task. During this task, participants were shown a 10-min segment of an academic lecture, videotaped by an audiovisual professional. The segment contained portions of an actual lecture given by a professor of developmental psychology (Ross Parke) discussing child development. After watching the lecture, students completed measures of lecture comprehension. Four open-ended questions and five multiple-choice questions regarding material presented during the videotaped lecture were administered on the computer. Two independent judges, unaware of participants' group status, graded responses to the open-ended questions. A maximum of 5 points was awarded to each open-ended answer (20 points total) and 2 points to each correct multiple-choice response (10 points total). Interrater reliability for the "grades" to the four open-ended questions was excellent (M intraclass correlation coefficient = .95).

Self-Reported Concentration. To assess levels of concentration, participants were asked on the computer to rate how difficult it was for them to concentrate while watching the videotaped lecture and how preoccupied they were with other things while answering questions about the lecture (1 = *not at all*, 7 = *a great deal*).

Procedure

The procedure of this study was very similar to that of Study 1. The primary differences were that participants (1) did not engage in planning, (2) watched and answered questions about a videotaped lecture (rather than reading and answering questions about a passage), and (3) completed alternate measures of concentration.

During the videotaped lecture task, participants were seated in front of a television set and instructed to watch the 10-min video clip. Once again, they were provided a cover story to divert their attention from our primary hypothesis—namely, they were told that in this portion of the study, we were "pretesting instructional videos" for a future study. The experimenter left the room after turning on the videotape player. When the video clip was over, the experimenter returned and administered the computer-based portion of the study. Students were seated at a computer and instructed to answer questions about the lecture and, subsequently, to rate their levels of concentration. The experiment took approximately 1 hr to complete.

Results and Discussion

As in Study 1, we conducted planned contrast analyses to test our predictions. However, because there was no planning condition in this study (or in Study 3), these analyses involved contrasts among four groups only. Again, because there were no main effects or interactions with sex of student, all analyses were conducted by collapsing across this variable. Fourteen students participated in each of the two dysphoric groups and 13 in the two nondysphoric groups.

Changes in Mood

At the beginning of the study, dysphoric students were more depressed ($M = 3.98$, $SD = 1.94$) than nondysphoric students ($M = 2.15$, $SD = 1.53$), $t(50) = 3.87$, $p < .0003$. As in Study 1, the results of a pairwise comparison conducted 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 ($M = +0.79$, $SD = 1.30$) and dysphorics who distracted became less depressed ($M = -0.64$, $SD = 0.95$), $F(1, 50) = 14.02$, $p < .0005$. In contrast, no significant difference was found in changes in depressed mood between nondysphoric ruminators ($M = -0.11$, $SD = 0.46$) and nondysphoric distractors ($M = +0.23$, $SD = 1.11$), $F < 1$, *ns*. Furthermore, the results of planned contrasts showed that dysphoric participants who ruminated subsequently reported significantly higher levels of dysphoria compared to dysphoric participants who distracted, $F(1, 50) = 8.77$, $p < .005$, as well as compared to the remaining three groups, $F(1, 50) = 22.48$, $p < .0001$.

Videotaped Lecture Task

Replicating the results of Study 1, planned contrasts revealed that dysphoric participants induced to ruminate spent more time answering multiple-choice questions about the videotaped lecture than did all the other groups, $F(1, 50) = 3.99$, $p = .05$ (see middle of Table I). As predicted, the dysphoric ruminative group spent more time on the multiple-choice questions than did the dysphoric distracting group, $F(1, 50) = 5.02$, $p < .03$, and, importantly, dysphoric distractors did not differ from the two nondysphoric groups in their answering pace ($F < 2$). It should be noted that these analyses were performed following a rank transformation of the data, because the results of Hartley's test indicated that the populations from which our samples were drawn had unequal variances (Ott, 1993). A similar, albeit nonsignificant, trend was found for open-ended questions—that is, dysphoric ruminators spent more time answering these questions than did the remaining three groups. Once again, these findings suggest that rumination, in the presence of a depressed mood, hurt students' concentration while answering the questions.

Furthermore, if we take into account how much time participants spent on the open-ended questions, dysphoric ruminators scored marginally significantly lower (out of a total 20 points) on these questions than the other three groups, $F(1, 50) = 3.77$, $p < .06$, and significantly lower than dysphoric distractors, in particular, $F(1, 50) = 4.42$, $p < .04$. (These data met the assumption of parallelism for analysis of covariance.) In addition, planned contrasts revealed that dysphoric distractors did not differ from the two nondysphoric groups in their performance on the open-ended questions, when completion time was covaried out ($F < 1$). Finally, because nondysphoric ruminators appeared to perform better than the nondysphoric distractors (see Table I), we conducted a post hoc Tukey comparison; the results of this test indicated a lack of a significant difference between these two groups (Tukey's HSD < 3.76 , *ns*). No significant group differences were also found for participants' scores on the multiple-choice questions, even after accounting for time. These results

offer preliminary evidence that dysphoric rumination sometimes can deplete concentration to such a degree that one's performance suffers.

Self-Reported Concentration

As in Study 1, our hypothesis that rumination would impair levels of self-reported concentration received some support. Results from a planned contrast showed that dysphoric participants who ruminated reported having significantly more difficulty concentrating while watching the videotaped lecture than did the other three groups, $F(1, 50) = 6.56, p < .02$, and marginally significantly more difficulty than did dysphoric distractors, $F(1, 50) = 3.09, p < .09$ (see middle of Table II). Also, as expected, dysphoric distractors did not differ from the two nondysphoric groups in their reported concentration on the lecture ($F < 1$). Thus, given their diminished concentration, it is not surprising that dysphoric ruminators spent significantly more time on these questions than did all the other groups.

As predicted, a planned contrast additionally showed that, of the four groups, dysphoric students who ruminated reported the highest levels of preoccupation with other things while answering questions about the lecture, $F(1, 50) = 4.36, p < .05$ (see Table II). However, pairwise comparisons showed that the two dysphoric groups did not differ significantly in how preoccupied they were ($F < 1$). As expected, however, dysphoric distractors did not differ from the two nondysphoric groups in their self-reported preoccupation during the lecture ($F < 3$).

In this study, we found further evidence that dysphoric rumination somewhat reduces reported concentration, slows one down, and, additionally, even harms performance. In Study 3, we tested our general hypothesis on yet a different academic task—that is, proofreading written text. Proofreading is an integral part of the writing process, yet it can be argued that it is less interesting and less absorbing than reading scholarly text (Study 1) or watching a lecture (Study 2) and, therefore, may also be easily disrupted by ruminations and interfering, off-task thoughts.

STUDY 3

Method

Overview

Dysphoric and nondysphoric students ruminated or distracted, then engaged in a puzzle-solving task and reported on the frequency of interfering thoughts experienced during this task. Next, participants were asked to proofread a page of written text. As in the previous two studies, depressed mood was measured before and after the response manipulation task.

Participants and Procedure

Sixty-five Introductory Psychology students, 28 men and 37 women, received course credit for participating in this study. We recruited 33 students with BDI scores

of 12 and above for the dysphoric group ($M = 17.21, SD = 5.02$) and 32 students with BDI scores of 3 and below ($M = 1.38, SD = 1.10$) for the nondysphoric group. Once again, students were invited to participate within 2 weeks of filling out the BDI. The procedure was similar to that employed in Study 2, except that, following the response manipulation task and the second mood assessment, participants completed a puzzle-solving task, the CIQ, and a proofreading task.

Materials

Mood Questionnaires. As in the previous two studies, students were asked to complete two packets of mood questionnaires during the experiment. These packets asked participants to evaluate their current mood, including levels of sadness and depression (correlated $r = .81$ and $r = .78$ at the first and second assessment, respectively).

Response Manipulation Tasks. As in Study 2, students were given 8 min to focus on items that were either ruminative (rumination condition) or distracting (distraction condition).

Puzzle-Solving Task and Interfering Thoughts. Participants were presented on the computer with several moderately difficult puzzles. Examples include figuring out the combination of a padlock or the seating arrangement of airplane passengers from a set of clues. Students were invited to work on the puzzles for as long as they wished. This task gave us the opportunity to measure students' interfering thoughts. Accordingly, as in Study 1, participants completed the CIQ, in which they rated the frequency of a list of possible thoughts (1 = *never*, 5 = *very often*) that they experienced during the puzzle-solving task (Cronbach's $\alpha = .89$).

Proofreading Test. For this task, students were asked to proofread a page of written text. The text consisted of two prose paragraphs on the topic of linguistic education, containing a total of 23 errors (e.g., "In the early stage of it's development, phonemic awareness does not involve ritten letters or words"). Students were instructed to "check for all grammatical, punctuation, and spelling errors," and to circle any errors that they found. A final score was computed by counting all of the correctly circled errors (ranging from 0 to 23). The number of incorrectly circled errors (i.e., "false alarms") was also recorded. Previous researchers have used such proofreading tests as a measure of performance (e.g., Cohen & Spacapan, 1978).

Results and Discussion

No main effects or interactions with sex of student were observed; therefore, again, all analyses were collapsed across this variable. There were 16 participants in the dysphoric-ruminative group, 17 in the dysphoric-distracting group, 15 in the nondysphoric-ruminative group, and 17 in the nondysphoric-distracting group.

Changes in Mood

As in the first two studies, dysphoric students reported greater negative mood at the beginning of the experiment ($M = 4.62, SD = 2.06$) than nondysphoric students ($M = 2.66, SD = 1.89$), $t(62) = 4.01, p < .0002$. Also, once again, after the response

task manipulation, a significant difference was found between changes in mood shown by dysphoric participants in the distraction and rumination conditions, such that dysphorics who were induced to ruminate became more dysphoric ($M = +0.75$, $SD = 1.35$) and dysphorics who were induced to distract became less dysphoric ($M = -0.53$, $SD = 1.10$), $F(1, 61) = 9.97$, $p < .003$. By contrast, no differences in changes in depressed mood were found between nondysphoric students who ruminated ($M = +0.20$, $SD = 1.24$) and those who distracted ($M = +0.35$, $SD = 0.95$), $F < 1$, *ns*. Furthermore, as predicted, dysphoric ruminators reported significantly higher levels of depressed mood after the response task manipulation than did the other three groups, $F(1, 61) = 18.80$, $p < .0001$, and than dysphoric distractors in particular, $F(1, 61) = 7.44$, $p < .009$.

Interfering Thoughts

Supporting our hypothesis and replicating the findings of Study 1, the dysphoric-ruminative group evidenced significantly more interfering thoughts—that is, higher CIQ scores—than did the dysphoric-distracting group, the nondysphoric-ruminative group, and the nondysphoric-distracting group, $F(1, 61) = 9.18$, $p < .004$ (see bottom of Table II). Also, as expected, dysphoric ruminators showed marginally significantly higher CIQ scores than did dysphoric distractors, $F(1, 61) = 3.04$, $p < .09$; and dysphoric distractors did not differ from the two nondysphoric groups ($F < 2$).

Proofreading Test

Importantly, dysphoric rumination appeared to hurt students' performance on the proofreading task. According to the results of a planned contrast, dysphoric participants induced to ruminate obtained a lower score (out of a total of 23) on the proofreading test than did the remaining three groups, $F(1, 61) = 7.60$, $p < .008$ (see bottom of Table I). As predicted, dysphoric ruminators caught fewer errors in the page of written text than did dysphoric distractors, $F(1, 61) = 4.66$, $p < .04$, and dysphoric distractors did not differ significantly from the two nondysphoric groups ($F < 1$). Notably, these results remained virtually identical when participants' final scores were adjusted for the number of "false alarms." However, because this task was not timed, we were unable to account for students' pace.

GENERAL DISCUSSION

The results of the three studies reported in this paper supported our general hypothesis that ruminative responses to depressed mood interfere with concentration on important academic tasks. Whether reading (Study 1), watching, and listening to a lecture (Study 2), or proofreading written text (Study 3), dysphoric students instructed to focus on their feelings and their personal characteristics reported relatively more difficulty concentrating and more frequent interfering, off-task thoughts, took relatively more time completing their assignments, displayed somewhat impaired work strategies and performance, and expressed negative moods. By contrast, dysphoric participants who were induced to divert their attention away from

themselves for 8 min proved to be no different from nondysphorics in their moods, reported thoughts and concentration, and pace and performance on the academic tasks.

In Study 1, relative to students who distracted themselves for 8 min, dysphoric ruminators were slower in reading a passage from the GRE, more likely to return to previously-read material, and reported less time concentrating and more frequent off-task thoughts during the reading (e.g., "I thought about the difficulty of the task"). In Study 2, after watching a lecture about child development, dysphoric ruminators were slower in answering test questions about the material presented, scored lower on these questions after accounting for time, and reported slightly greater difficulty concentrating on the lecture than the remaining groups. And, in Study 3, dysphoric ruminators reported marginally more frequent interfering thoughts during a puzzle-solving task and were less proficient at catching spelling and grammatical mistakes on a page of written prose than dysphoric distractors, nondysphoric ruminators, or nondysphoric distractors. Finally, consistent with a great deal of previous work (see Lyubomirsky & Tkach, *in press*, for a review), in all three studies, dysphorics instructed to ruminate became more depressed and dysphorics instructed to distract became less so.

Differences in our participants' levels of concentration were assessed relatively directly (e.g., by asking them precisely how much time they spent concentrating on an assignment), as well as indirectly (e.g., by recording how quickly they were able to carry out a task). Consequently, the results from all three studies offer converging evidence that dysphoric rumination depletes concentration. These findings are testament to the tenacity of rumination, suggesting that negative, ruminative thoughts besieged our participants during, and even after, potentially distracting academic tasks.

HOW DOES DYSPHORIC RUMINATION IMPAIR CONCENTRATION?

A question that remains to be addressed is how exactly does dysphoric rumination impair or diminish concentration? Ruminative responses to dysphoria involve repetitive thoughts focused on the why, the how, the what if, and the what now of one's depressed mood and depressive symptoms. Such thoughts themselves are often absorbing, compelling, and self-perpetuating (Lyubomirsky & Nolen-Hoeksema, 1993) and are thus likely to intrude during both trivial and important everyday activities and chores. Past research on cognitive interference has shown that off-task cognitions, such as ruminations or intrusive thoughts, deplete cognitive resources, raise demands on attentional capacity, and increase cognitive "load" (for reviews, see Sarason et al., 1996). For example, students whose cognitions during course examinations or laboratory tasks are characterized by off-task thoughts show reduced concentration and poor performance relative to their more task-focused counterparts (e.g., Mikulincer, 1989; Pierce et al., 1998; Sarason, 1984; Seibert & Ellis, 1991; cf. Gotlib, Roberts, & Gilboa, 1996). Because dysphoric ruminative thoughts divide attention, fewer attentional resources can be directed towards a specific task—whether it is reading, writing, or listening to a professor or a friend—resulting in a

reduction in the amount of information that can be processed (Baddeley & Hitch, 1994). Phenomenologically, the consequence is a sense of loss of concentration on the task at hand and the presence of negative, interfering thoughts; practically, the consequences are a loss of speed and, possibly, decrements in performance on slightly to moderately demanding tasks. The results from our three studies provide evidence for all of these effects. Importantly, our findings suggest that dysphoric ruminative thoughts possess a tenacity such that they are able to “poison” subsequent activities. In contrast, “adaptive” types of thought, such as benign distracting images (induced in all three studies) or thoughts about the steps involved in planning or problem solving (induced in Study 1), though absorbing and compelling, are relatively easy to dismiss or cast off when the necessity arises. Testing the precise mechanisms by which the combination of dysphoria and rumination harms concentration is an important area of investigation for the future.

Rumination alone, in the absence of a depressed mood, was *not* associated with impaired concentration in our studies. Thus, it appears that absorbing ruminative thoughts are not difficult to cast off for persons who are not dysphoric. This finding replicates previous work, which has shown that rumination has adverse consequences only in the context of dysphoria (e.g., Lyubomirsky et al., 1998, 1999; Lyubomirsky & Nolen-Hoeksema, 1995). Additionally, it is possible that dysphorics have an already reduced cognitive capacity (Hartlage, Alloy, Vazquez, & Dykman, 1993; Hasher & Zacks, 1979), suffer from deficits in working memory (Kuhl & Helle, 1986), are unable to inhibit intrusive ruminative thoughts (e.g., Hertel & Rude, 1991; Linville, 1996), or, more likely, are willingly cultivating and nurturing those thoughts, even when doing so interferes with everyday activities and disrupts on-task streams of thought (cf. Davis & Nolen-Hoeksema, 2000; Lyubomirsky & Nolen-Hoeksema, 1993; Watkins & Baracaia, 2001).

LIMITATIONS AND FUTURE QUESTIONS

Given the universality of depressed moods, the results of our three studies are important in highlighting the adverse consequences of rumination in the context of even mild or moderate dysphoria. Yet, because our participants were not selected for major depression (American Psychiatric Association, 2000), we do not know whether our findings generalize beyond mildly-to-moderately depressed students. We are encouraged, however, by the results of previous studies, which suggest that self-focusing tasks maintain depressed mood, and externally focusing tasks lift depressed mood, among clinically depressed participants (Fennell & Teasdale, 1984; Gibbons et al., 1985; see also Kuehner & Weber, 1999). Exploring the effects of rumination and distraction manipulations on concentration in clinical populations should be a priority in future work.

In our three studies, all the participants were granted as much time as they desired to complete the various academic tasks. Consequently, we did not expect consistent group differences in students' actual performance. Future investigators, however, could impose time constraints and/or employ laboratory tasks that vary in the extent to which they are challenging and cognitively demanding. One might

speculate that intrusive ruminations would be a relatively greater burden during assignments requiring a great deal of thought and effort, because of the even greater cognitive resources required to accomplish them successfully. Alternatively, tasks that are more challenging may be more distracting, temporarily attenuating dysphoric ruminators' ruminations and thus boosting, rather than depleting, on-task concentration. Whether these predictions are supported remains a question for future research.

Although our studies benefited from the use of both direct and indirect measures of concentration—allowing one method to compensate in part for the drawback of another (e.g., speed at task vs. self-report)—further research could extend this work by employing alternative techniques. One possibility is to assess vigilance performance—for example, by recording participants' ability to stay alert to occasional changes in repetitive stimuli over extended periods of time (e.g., Dittmar, Warm, Dember, & Ricks, 1993). Other possibilities include tracking eye movements in order to assess the extent and duration of concentration lapses; measuring pupillary responses, as pupil size has been associated with cognitive effort and cognitive load (e.g., Granholm, Morris, Sarkin, Asarnow, & Jeste, 1997); and using the experience sampling method (ESM; Csikszentmihalyi & Larson, 1987) to capture declines in concentration in naturalistic settings.

IMPLICATIONS AND CONCLUSIONS

Our three studies provide evidence that passive, dysphoric rumination interferes with concentration during such activities as reading, listening, and test taking. These findings suggest that, in addition to its documented deleterious effects on mood, thinking, and complex problem solving (e.g., Lyubomirsky et al., 1998, 1999; Lyubomirsky & Nolen-Hoeksema, 1995; Morrow & Nolen-Hoeksema, 1990), self-focused rumination interferes with instrumental behavior in several critical areas of academic life. However, our findings also have notable implications for instrumental behavior in the interpersonal and work domains. For example, it is likely that engaging in dysphoric rumination during social interactions could lead people to miss important social cues during a conversation with a friend, fail to recall exchanges of information during a business lunch, or serve as less than supportive listeners at home. Thus, a woman who is ruminating about why she cannot snap out of her dysphoric mood may neglect to notice a supervisor's change in tone or a child's first symptoms of an illness, or to tune out during an important meeting and miss an opportunity to present her views. Likewise, because of his preoccupation with ruminative thoughts, a dysphoric individual may end up behaving awkwardly toward friends or being less assertive in an office meeting, not to mention burning his dinner, stepping on a nail, missing his exit off the freeway, or even worse (see Coddington & Troxell, 1980; Cohen & Spacapan, 1978; Selzer & Vinokur, 1974). Ultimately, the consequences of such deficits in instrumental behavior could activate a vicious cycle by decreasing people's enjoyment of social interactions and reducing their effectiveness at work, leading to loss of friendships and business opportunities, and, in turn, contributing to ever greater distress and greater rumination.

Despite accumulating evidence to the contrary, present-day Western culture still embraces the notion that exploring and focusing on one's feelings in the face of personal problems and negative moods is valuable and adaptive. By contrast, our three studies extend previous research by testifying to the detrimental consequences of dysphoric rumination for instrumental behavior in academic settings. Because of the implications of these findings for successful functioning in everyday life, it is important for future researchers to advance our understanding of how to short-circuit these adverse effects—perhaps, by exposing dysphoric individuals to nonruminating models, educating them about the value of absorbing work projects or hobbies, or teaching them to introduce short-term distraction “breaks” into their days.

ACKNOWLEDGMENTS

This research was supported in part by a faculty intramural grant, undergraduate mini-grants, and a Senior Student Grant from the University of California, as well as by a grant from the American Honda Foundation. We are grateful to Thao Trinh for her enormous contributions to this research, to John Pinto for computer programming assistance, and to Allison Abbe for comments on an earlier draft.

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