

Mood Regulation in Depression: Differential Effects of Distraction and Recall of Happy Memories on Sad Mood

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Recent research suggests that the recall of positive memories plays an important role in mood regulation. In this study, the authors examined the ability of currently depressed, formerly depressed, and never-depressed participants to regulate sad mood through the recall of positive memories or through distraction. Although improvement in mood was found for all participants in response to distraction, under instructions to recall positive memories, never-depressed participants' moods improved, whereas formerly depressed participants' sad moods remained unchanged. It is important to note that depressed participants exhibited a worsening of their sad moods after recalling positive memories. These results suggest both that depression is associated with an impaired ability to use positive recall to regulate a sad mood and that this impairment continues to be evident following recovery.

Keywords: depression, emotion, regulation, mood, memory

Imagine receiving a negative evaluation at work, having an argument with your partner, discovering that your favorite pet died unexpectedly; and imagine experiencing all of this on a gray, rainy, winter day. Situations like these, which have the potential to induce a lasting sad mood state, are part of everyday life. Observations from everyday life also demonstrate that, for most people, sad mood states are transient; recovery typically occurs quickly and without the use of explicit strategies to regulate the sad mood. It is important to note, however, that there is a wide range of individual differences in the ability to regulate moods and emotions. Given the importance of successful emotion regulation for both physical and mental health (e.g., Denollet, Nyklicek, & Vingerhoets, 2006), it is critical that we begin to identify factors and mechanisms that are associated with both the intentional and the automatic regulation of negative affect.

In particular, it is becoming increasingly clear that impairment in the regulation of negative moods and emotions plays a significant role in the onset and maintenance of Major Depressive Disorder (MDD). Teasdale (1988), for example, postulated that individuals who experience episodes of depression do not differ from their nondepressed counterparts in the degree to which they become sad but, rather, are characterized by an inability to repair or regulate their moods once they become sad. Several investigators have now demonstrated that depression is associated with mood-congruent memory (i.e., recall of negatively valenced material) and have postulated that mood-congruent recall serves to

maintain depression and sustained sad mood states (see Matt, Vazquez, & Campbell, 1992, and Williams, Watts, MacLeod, & Mathews, 1997, for reviews). Far fewer researchers, however, have examined cognitive processes that may facilitate recovery from negative mood in depressed individuals.

Using unselected samples of participants, investigators studying the relation between mood and memory have not only demonstrated that negative mood states can enhance the retrieval of positively valenced material but also have proposed that mood-incongruent recall can play a powerful role in the regulation of mood and emotion (Erber & Erber, 1994; Parrott & Sabini, 1990; Rusting & DeHart, 2000). More specifically, the results of investigations in this area suggest that negative mood increases the accessibility of positive material and that people retrieve pleasant thoughts and memories to regulate or reverse unpleasant moods (e.g., Josephson, Singer, & Salovey, 1996).

Another specific mood-regulation process that has received increasing theoretical and empirical attention is distraction. Erber and Tesser (1992) found that distraction is a particularly effective regulatory process if it demands sufficient cognitive resources to stop participants from focusing on their mood-related thoughts. Erber and Tesser proposed that distraction prevents participants from engaging in the kind of mood-congruent thinking that would be sufficient to maintain their negative moods. In fact, Siemer (2005) demonstrated that the effects of distraction on mood are mediated by preventing mood-congruent thoughts. We find it interesting that investigators have found that distraction is effective in alleviating sad mood in both nondysphoric and dysphoric participants (e.g., Fennell, Teasdale, Jones, & Damle, 1987; Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998; Teasdale & Rezin, 1978).

Only one study has examined the effectiveness of both distraction and recall of positive memories in repairing sad mood in dysphoric individuals. Joormann and Siemer (2004) induced a negative mood and assessed the effects of distraction and of recalling positive memories on the intensity of the negative mood.

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This research was supported by National Institute of Mental Health Grant MH59259 to Ian H. Gotlib and by German Research Foundation grants to Jutta Joormann (DFG JO/399-1 and JO/399-2) and to Matthias Siemer (DFG SI 873-1 and SI 873-2).

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These investigators found that although distraction reduced the level of sad mood in both dysphoric and nondysphoric individuals, recalling positive autobiographical memories was effective only for nondysphoric participants; the dysphoric participants' moods did not improve after they recalled positive memories.

Taken together, these results suggest not only that there are important individual differences in the effectiveness of mood-regulation processes, but also that difficulties in mood regulation play an important role in emotional disorders. No study, however, has yet extended this formulation to clinically depressed participants, assessing the effectiveness of distraction and recall of positive autobiographical memories in regulating sad mood in MDD. Moreover, because the dysphoric participants in previous studies were currently experiencing some symptoms of depression, it is impossible to determine whether difficulty regulating sad mood is simply another symptom of being depressed or, instead, is a more stable characteristic of individuals who are vulnerable to becoming depressed. Depression is a highly recurrent disorder (Kessler, 2002), and this high rate of recurrence almost certainly reflects the presence of stable vulnerability factors that place certain individuals at increased risk for experiencing multiple episodes of depression over the course of their lives. If deficits in mood regulation are, in fact, a vulnerability factor for depression, we would expect both currently and formerly depressed individuals, compared with never-disordered controls, to demonstrate difficulties in regulating sad mood states.

The present study was designed to examine these questions by assessing the effectiveness of two cognitive processes that have been implicated in emotion regulation—recall of positive autobiographical memories and distraction—in repairing sad mood in clinically depressed individuals, in a sample of formerly depressed but currently asymptomatic participants, as well as in never-depressed controls. We predicted that whereas distraction would be effective in improving sad mood in all participants, recalling positive memories would alleviate sad mood only in never-depressed participants; neither currently nor formerly depressed participants would benefit from positive recall and would remain sad.

Method

Participants

Three groups of participants took part in the study: participants diagnosed with a current MDD, participants who had experienced at least one diagnosable depressive episode in their lives but who were currently remitted (RMD), and never-disordered controls (NC). Participants were solicited from two outpatient psychiatry clinics in a university teaching hospital, as well as through advertisements posted in numerous locations within the local community. A phone screen established that participants were fluent in English and were between 18 and 60 years of age. Participants were excluded for severe head trauma, learning disabilities, as well as for current panic disorder, current social phobia, psychotic symptoms, bipolar disorder, and alcohol or substance abuse within the past 6 months. Eligible individuals were invited to come to the laboratory for a more extensive interview.

Trained interviewers administered the Structured Clinical Interview for the *DSM-IV* (SCID; First, Spitzer, Gibbon, & Williams,

1995) to these individuals during their first session in the study. This interview schedule assesses *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994) current and lifetime diagnoses for anxiety, mood, psychotic, alcohol and substance use, somatoform, and eating disorders. The SCID has demonstrated good reliability for the majority of the disorders covered in the interview (Skre, Onstad, Torgersen, & Kringlen, 1991). SCID interviewers had previous experience with administering structured clinical interviews and were trained specifically to administer the SCID. Our team of interviewers achieved excellent interrater reliability for current and previous episodes of MDD ($\kappa = 1.00$) and controls ($\kappa = 0.92$; Gotlib, Krasnoperova, Yue, & Joormann, 2004).

Participants were included in the depressed group if they met *DSM-IV* criteria for MDD. Participants were included in the RMD group if they met *DSM-IV* criteria for a past major depressive episode. In addition, RMD participants were required to meet criteria from a slightly modified version of the SCID that was used to determine whether each participant had fully recovered from depression, on the basis of guidelines recommended by the National Institute of Mental Health Collaborative Program on the Psychobiology of Depression (Keller et al., 1992): 8 consecutive weeks with no more than two symptoms of no more than a mild degree (i.e., ratings of 1 [*no symptoms*] or 2 [*minimal symptoms, no impairment*]). The never-disordered control group consisted of individuals with no current *DSM-IV* diagnosis and no history of any Axis I disorder. One hundred fifty-one individuals (45 MDD, 41 RMD, and 65 NC) participated in this study.

Materials

Questionnaires. Participants completed a mood questionnaire at three points during the study: before and after the mood induction and after the recall or distraction task. At each assessment, participants were asked to rate their present state on several 9-point Likert scales ranging from 1 (*not at all*) to 9 (*very*). The questionnaire included the items "sad," "happy," and "bad." We randomly interspersed these items among six filler items ("concentrated," "distracted," etc.) to help disguise the focus of the study on positive and negative mood, as well as on the repeated measurement of mood state. Participants also completed the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), a 21-item self-report measure of the severity of depressive symptoms. The acceptable reliability and validity of the BDI-II has been well documented (Beck et al., 1996).

Mood induction. To induce a sad mood, we asked RMD and NC participants to watch a 10-min film clip depicting the suicide of a college student (taken from the movie *Dead Poets Society*; Weir, 1989). This induction method has been found to be effective in previous research (Joormann & Siemer, 2004). Before watching the movie, participants were asked to get into the feeling of the movie as intensely as possible and to try to imagine what they would feel if they were in this situation. They were also told that they would be asked questions about the movie at the end of the presentation. For ethical reasons, we did not put the MDD participants through a sad mood induction procedure. Instead, because participants in the depressed group were already in a sad mood, they were asked to watch a 10-min neutral film clip that depicted

Table 1
Characteristics of Participants

Group	<i>n</i>		% Caucasian	Age (years)		Number of depressive episodes		% currently on psychotropic medication	% currently in psychotherapy	Beck Depression Inventory	
	Women	Men		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			<i>M</i>	<i>SD</i>
Depressed	34	11	71	36.70 _a	10.53	3.37 _a	2.24	52	53	30.09 _a	11.45
Remitted	29	12	83	35.46 _a	9.26	3.54 _a	3.92	27	22	3.38 _b	4.03
Control	39	26	64	36.94 _a	11.32	0 _b		0	0	2.17 _b	3.49

Note. Means with the same subscript within columns are not significantly different at $p < .05$.

a nature scene. As we report below, however, the three groups of participants did not differ in their mood ratings following exposure to the film clips.

Distraction task and autobiographical memory task. The distraction task was adapted from a task used by McFarland and Buehler (1998). It was introduced as a task that assesses “cognitive style” and was intended to distract the participants from focusing on their current mood states. Participants were presented with a list of 40 base words and were instructed to use the letters in each base word to generate and write down two shorter words (e.g., monastery: money and nose). McFarland and Buehler reported that the task was easy to perform but interesting enough to keep participants focused on the task, which was supported in our own pilot testing. In the autobiographical recall task, participants were asked to write down descriptions of positive events that happened to them during their high school years that made them feel happy at the time that they occurred. We restricted recall to memories from high school years to reduce variability in how remote the participants’ memories were. Participants were asked to go back in their minds to their high school years and to think about good, positive events that made them feel happy. They were then asked to write these memories down on a piece of paper. They were instructed to give brief but detailed descriptions of those events. These descriptions were subsequently rated by three independent raters in terms of specificity and valence.

Procedure

All participants were tested individually. The experimenter introduced the study as an “investigation of individual differences in imagination and memory.” Participants’ comments during debriefing indicated that this framing was successful. After the participant gave informed consent, the experimenter introduced the mood-induction procedure for the RMD and NC participants and the neutral film clip for the MDD participants. This task was described as an imagination task, in which participants were asked to “try to get into the feeling of the movie.” The movies were then shown for 10 min, after which participants completed a nine-item questionnaire: six items about the movie and three interspersed mood ratings. Participants were asked, for example, to indicate how well they were able to concentrate on the movie and how easy they found it to get into the feeling of movie. After completing this questionnaire, participants were randomly assigned to the two conditions. Approximately half of the participants within each diag-

nostic group were instructed to recall positive autobiographical memories (21 MDD, 29 NC, 19 RMD) and were provided with a sheet of paper on which to write down the memories. The other half of the participants were instructed to work on the distraction task (24 MDD, 36 NC, 22 RMD). Both groups were given 8 min to finish the task, after which they completed another questionnaire interspersed with mood ratings and several other filler scales. The experimenter then debriefed the participants. The entire procedure took about 20 min.

Results

Participant Characteristics

Demographic and clinical characteristics of the three participant groups are presented in Table 1. As expected, the MDD participants had higher BDI-II scores than did both the RMD, $t(81) = 13.96, p < .01$, and NC participants, $t(104) = 18.18, p < .01$, who did not differ significantly from each other, $t(101) = 1.59, p > .05$. The analysis of the BDI-II scores did not yield a significant interaction of Group \times Task (recall vs. distraction), $F(2, 145) < 1$. Whereas the RMD participants had no comorbid diagnoses, 6 participants in the MDD group were diagnosed with a comorbid disorder.¹ Eight of the MDD participants and 4 of the RMD participants reported having had too many previous depressive episodes to count; the remaining MDD and RMD participants did not differ significantly in the mean number of previous depressive episodes reported, $t(62) < 1, ns$.

Mood Ratings

Figures 1 and 2 present the mean mood ratings for the different groups in the distraction and recall conditions, respectively, before and after the mood-regulation task. To ensure that the three participant groups did not differ in their level of sad mood before they participated in the distraction or recall task, we conducted a one-way analysis of variance (ANOVA) on the participants’ sad-mood ratings. This analysis did not yield a significant group effect, $F(2,$

¹ Excluding participants with comorbid diagnoses from the analysis did not change the results; the three-way interaction of Group \times Time \times Task for mood ratings remained significant, $F(2, 139) = 3.31, p < .05$.

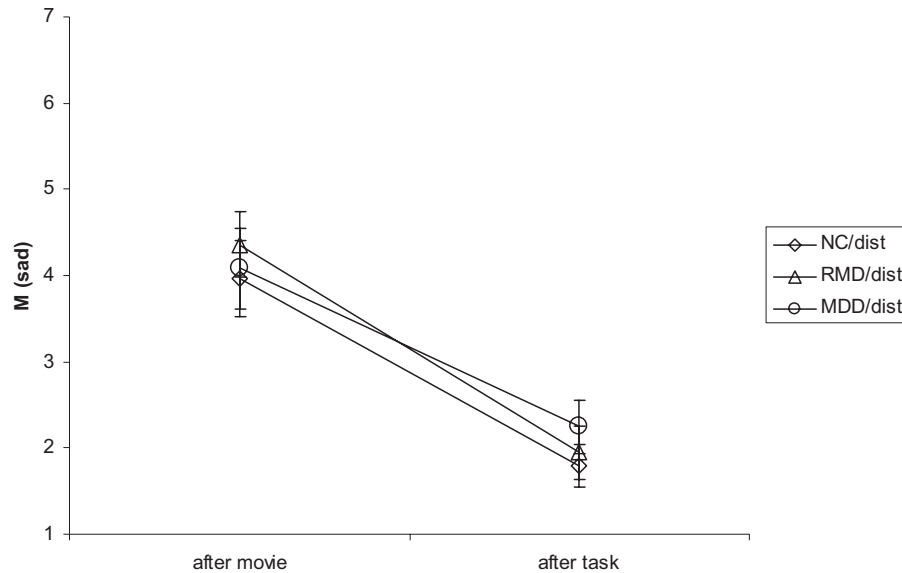


Figure 1. Distraction. Mean sad-mood ratings after the mood induction (movie) and after the distraction task (dist) in the major depressive disorder (MDD), currently remitted (RMD), and never-disordered control (NC) groups. Error bars represent one standard error.

148) < 1, *ns*.² In addition, we compared pre-post induction mood ratings for the NC and RMD participants to ensure that the mood induction was equally effective in both groups. The RMD and the NC groups had virtually identical sad-mood ratings before and after the mood induction (before $M_s = 2.70$ and 2.71 , respectively; after $M_s = 3.73$ and 3.89 , respectively). The repeated measures ANOVA yielded a significant main effect of pre-post mood induction, $F(1, 82) = 15.33$, $p < .01$; there was no significant interaction of Group \times Pre-Post Induction, $F(1, 81) < 1$, *ns*.

We predicted that MDD and RMD participants would not exhibit improvement in their sad moods under mood-incongruent recall instructions but would show mood improvement under distraction; in contrast, we predicted that NC participants would benefit from both distraction and recall of positive autobiographical memories. To test this hypothesis, we conducted a three-way ANOVA with group (MDD, RMD, NC) and task (distraction vs. mood-incongruent recall) as between-subjects factors and time (after mood induction, after task) as a within-subject factor. This analysis yielded significant main effects of group, $F(2, 145) = 6.67$, $p < .01$; time, $F(1, 145) = 23.95$, $p < .01$; and task, $F(1, 145) = 5.29$, $p < .05$. The analysis also yielded significant two-way interactions of Group \times Time, $F(2, 145) = 6.98$, $p < .01$; Group \times Task, $F(2, 145) = 3.69$, $p < .03$; and Time \times Task, $F(1, 145) = 27.82$, $p < .01$. Most important, we obtained the predicted significant three-way interaction of Group \times Task \times Time, $F(2, 145) = 4.77$, $p < .01$. As predicted, the NC participants showed improvements in their mood states following both distraction ($M_{pre} = 3.97$, $SD = 2.62$; $M_{post} = 1.80$, $SD = 1.51$), $t(35) = 5.35$, $p < .01$, $d = 1.01$, and recall of positive autobiographical memories ($M_{pre} = 3.38$, $SD = 2.01$; $M_{post} = 1.86$, $SD = 1.57$), $t(28) = 3.14$, $p < .01$, $d = 0.81$. Also as predicted, the RMD participants showed improved mood after distraction ($M_{pre} =$

4.36 , $SD = 1.76$; $M_{post} = 1.95$, $SD = 1.50$), $t(21) = 6.72$, $p < .01$, $d = 1.48$, but not following positive recall ($M_{pre} = 3.89$, $SD = 2.60$; $M_{post} = 3.84$, $SD = 2.79$), $t(18) < 1$, *ns*. Finally, whereas the MDD participants showed a marked improvement in their mood ratings after distraction ($M_{pre} = 4.08$, $SD = 2.26$; $M_{post} = 2.25$, $SD = 1.54$), $t(23) = 3.70$, $p < .01$, $d = 0.95$, they showed a significant worsening of their moods following recall of positive memories ($M_{pre} = 3.71$, $SD = 1.87$; $M_{post} = 5.52$, $SD = 2.54$), $t(20) = 2.90$, $p < .01$, $d = -0.89$.³

Ratings of Memories

Independent raters blind to diagnostic group status and to the study hypotheses rated the total number of recalled events and the specificity and valence of the first five recalled events that partic-

² We conducted a power analysis to ensure that our groups reported equivalent levels of sad mood after the mood induction. At an adjusted alpha-level of $\alpha = .5$, our statistical power to detect an effect as small as $R^2 = .04$ was $1 - \beta = .95$, and our power to detect an effect as small as $R^2 = .02$ was $1 - \beta = .82$. We also included experimental condition as a factor in our analysis of the postinduction ratings, which did not yield a significant main effect of condition, $F(1, 145) < 1$, *ns*, or an interaction of Condition \times Group, $F(2, 145) < 1$, *ns*.

³ In this study we were interested specifically in the effect of distraction and recall on sad mood. Therefore, we conducted all analyses using the ratings on the "sadness" item. It is important to note, however, that we obtained similar results using a score that combined the sadness, badness, and reverse-scored happiness items, a significant three-way interaction, $F(2, 145) = 3.15$, $p < .05$.

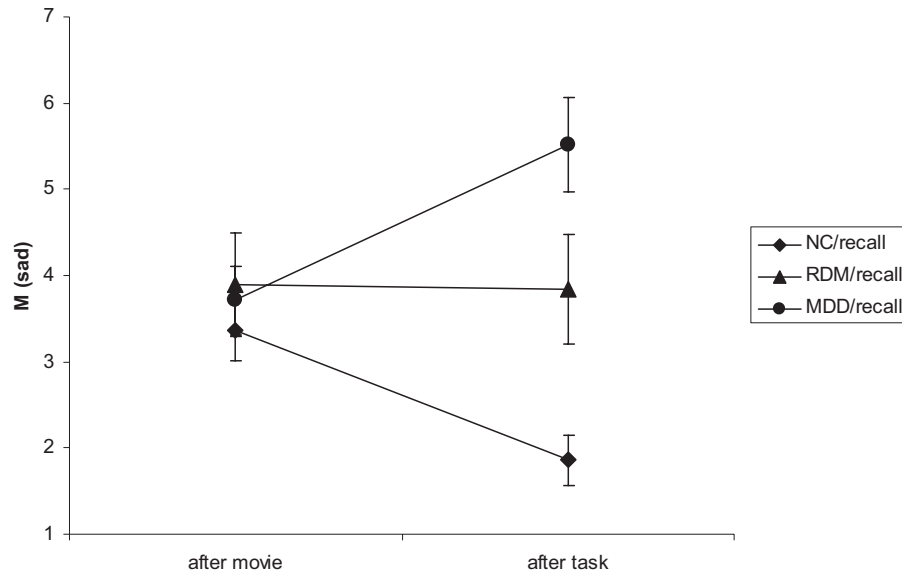


Figure 2. Positive recall. Mean sad-mood ratings after the mood induction (movie) and after the recall task (recall) in the major depressive disorder (MDD), currently remitted (RMD), and never-disordered control (NC) groups. Error bars represent one standard error.

ipants in the recall condition had written down.⁴ Consistent with rating guidelines for the autobiographical memory test (Williams & Broadbent, 1986), specific events were defined as events that occurred at a particular place and time and lasted less than a day. Categorical events were defined as a summary of repeated events. Memories of 59 participants were rated by three different raters, and an additional 10 participants were rated by one rater. Interrater agreement based on the 59 participants rated by multiple raters was high, with intraclass correlation (2, 59) ranging from .75 (specificity) to .99 (number of memories). For those participants whose memories were rated by multiple raters, ratings were averaged.

Participants recalled an average of 8.28 memories ($SD = 5.40$); the three diagnostic groups did not differ with respect to the number of memories recalled, $F(2, 66) < 1$, *ns*. The average rated happiness of the memories, on a scale of 0 (*not at all happy*) to 10 (*extremely happy*) was 6.78 ($SD = 0.83$), again with no significant group differences, $F(2, 66) < 1$, *ns*. Finally, the proportion of specific events was relatively low in all groups ($M = .17$, $SD = .23$), with no differences among the three groups of participants, $F(2, 66) < 1$, *ns*. In sum, although depressed, remitted, and never-depressed participants did not differ in the number, valence, or specificity of the positive autobiographical memories they recalled, remitted participants did not benefit from recalling positive memories, and depressed participants' moods worsened.

Discussion

Investigating individual differences in mood regulation has important implications for understanding depression. In the present study, we examined whether two specific cognitive processes that have been implicated in the regulation of sad mood states—recall of positive autobiographical memories and distraction—are differentially effective in reducing the intensity of sad mood in depressed and nondepressed individuals. The results of this study

suggest that recall of positive memories is indeed effective in repairing sad mood in nondepressed participants. In fact, only for the nondepressed participants were recall of positive memories and distraction equally effective. In contrast, whereas distraction was effective in reducing sad mood in both currently and formerly depressed individuals, recall of positive autobiographical memories had no effect on the sad mood of formerly depressed participants and actually *increased* the level of sadness in currently depressed individuals. It is important to note that participants in the three groups did not differ in the number, positivity, or specificity of the positive memories they recalled. These results suggest, therefore, that although currently and formerly depressed participants can access positive memories when in a negative mood state, at least when instructed to do so, recalling positive memories is ineffective or even detrimental in repairing sad mood for these individuals.

The current results extend the findings of previous studies examining the relation of dysphoria and low self-esteem to the effectiveness of various mood-regulation processes. Setliff and Marmurek (2002) and Joormann and Siemer (2004), for example, found that low self-esteem and dysphoria, respectively, were associated with reduced recall and effectiveness of positive memories in improving mood following a negative mood-induction procedure (see also Josephson et al., 1996). Ours is the first study, however, to examine the effectiveness of recalling positive memories in regulating negative mood in diagnosed depressed participants, and it is the first to find evidence of impaired mood

⁴ There were no group differences when we examined all memories. The average rated happiness of the memories was 6.50, $F(2, 66) < 1$, *ns*. In addition, we asked a subsample of 39 participants to provide positivity ratings of the memories they had written down ("how happy did you feel during the event?"). The participants' ratings and the objective-observer ratings were highly correlated, $r = .74$.

regulation in formerly depressed individuals. The present findings suggest that the ineffectiveness of mood-incongruent recall in regulating sad mood is not simply a function of a depressive state but, rather, may represent a stable characteristic of people who are vulnerable to experiencing depressive episodes.

Although examining currently depressed individuals is an important and novel feature of our study, doing so meant that we could not ethically put all of our participants through a sad-mood-induction procedure. Thus, we compared the regulation of an induced mood in the control and remitted participants with the regulation of a naturally occurring negative mood in the depressed participants. It is important to note, however, both that there were no group differences in the intensity of sad mood immediately before all participants received either the distraction or the recall instructions, and that we obtained similar results in the currently and formerly depressed groups. Nevertheless, it is important that future researchers continue to compare these two groups using a broad range of automatic mood-regulation processes and intentional mood-regulation strategies. It is also important to note that we investigated differences in the regulation specifically of a sad mood state. Future researchers, therefore, might also investigate whether depressed and nondepressed participants differ in their regulation of other negative mood states, such as anger, shame, or guilt. Finally, our results indicate that, in contrast to distraction, watching a neutral film clip did not substantially improve sad mood in the MDD participants. This suggests that different forms of distraction are differentially effective in altering mood in depression, and future studies should examine more closely underlying mechanisms of mood regulation through distraction.

At this point, we can only speculate about the mechanisms underlying the current findings. Williams (1996), for example, has described the tendency for depressed persons to present overgeneral (i.e., script-like and contextually impoverished) autobiographical memories in response to valenced cue words. Overgeneral recall of positive memories might impair the effectiveness of mood-incongruent recall in regulating negative mood states. If these mechanisms were operative in the current study, however, we would have expected the depressed participants to recall fewer, less positive, and less specific memories than did the control participants; there were no group differences in the ratings of any of these constructs. Nevertheless, it is possible that the memories of the depressed and nondepressed participants differed on other important dimensions that were not assessed in the current study (e.g., vividness, absorption). It is also possible that the recall task did not capture depressed participants' attention to the same degree as did the distraction task, thereby allowing their attention to turn to mood-related thoughts and comparisons, a possibility that could be addressed in future studies (see Hertel & Hardin, 1990). It may be that the specific mood-induction or recall instructions used in this study affected the obtained results. In the current study, we used a movie depicting a suicide, which may have strongly affected the remitted depressed participants. We should point out, however, that the MDD and RMD participants exhibited a similar pattern of results, even though the MDD participants did not see the movie. Finally, to avoid demand effects, we did not instruct participants explicitly to recall positive memories to improve their mood. Future studies would profit from investigating depression-related differences in the effectiveness of intentional mood-

regulation strategies and automatic mood-repair processes, as well as the interaction of these strategies and processes.

A plausible explanation for the present findings involves the induction of self-focus or rumination in the depressed participants. Thinking about oneself and one's past, even if it is a happy past, may ultimately lead to rumination in depressed and formerly depressed participants, which in turn activates negative thoughts and feelings. Recalling a positive event and feeling may also have adversely influenced depressed participants' mood through a contrast effect. Conway and Ross (1984) demonstrated that recalling a negative past can improve current mood if it allows people to perceive self-improvement. Similarly, recalling a positive past can worsen mood if it suggests deterioration. Thus, depressed individuals may have compared their current situation and feeling with those past positive memories and feelings and focused on a worsening situation, which had the effect of deepening rather than improving their sad mood. Regardless of the reason for the obtained differences, however, the present results do suggest that there are differences among currently depressed, formerly depressed, and nondepressed individuals in the effectiveness of certain cognitive processes in regulating sad mood and, further, that difficulties in mood regulation extend beyond the depressive episode. Future research investigating these differences and their underlying mechanisms is likely to have important implications for treatment and prevention of recurrence of depressive episodes.

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Received January 21, 2006

Revision received November 6, 2006

Accepted November 14, 2006 ■