

Mild Depression, Mortality Salience, and Defense of the Worldview: Evidence of Intensified Terror Management in the Mildly Depressed

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Based on a terror management analysis of depression, the authors hypothesized that mildly depressed individuals would engage in especially vigorous worldview defense after mortality salience. Two studies were conducted in which mildly depressed and nondepressed American college students contemplated their own mortality or a neutral topic and then evaluated targets who supported or threatened aspects of their worldviews. Replicating previous research, subjects who contemplated their own mortality engaged in more defense of the worldview (more positive reactions to worldview supporters and more negative reactions to worldview threateners). Moreover, as predicted, mildly depressed subjects in both studies responded to mortality salience with significantly more worldview defense than did nondepressed subjects. Implications of these results for understanding and treating depression are briefly considered.

Depressed individuals have been described as dissatisfied with life or having lost faith in themselves and the world in which they live (e.g., Beck, 1967; Becker, 1964) and as being unusually realistic, having lost either the capacity or the will to distort reality to meet their psychological needs (e.g., Alloy & Abramson, 1979, 1988; Alloy & Ahrens, 1987; Coyne & Gotlib, 1983; but see, e.g., Barbaree & Davis, 1984; Beck, 1967; Campbell & Fehr, 1990, for opposing viewpoints that emphasize negative

distortions). From the perspective of terror management theory (Greenberg, Pyszczynski, & Solomon, 1986; Solomon, Greenberg, & Pyszczynski, 1991b), depressed individuals could be described as having difficulty maintaining faith in their cultural worldviews. We hypothesize that because of this weakness in the psychological structure that provides protection from mortality concerns, mildly depressed individuals would engage in especially strong *worldview defense* after being reminded of their mortality. The present studies were designed to test this hypothesis.

Terror Management Theory

Terror management theory (for a more thorough presentation, see Greenberg et al., 1986; Solomon et al., 1991b) posits that the juxtaposition of the uniquely human awareness of mortality with an instinctive drive for self-preservation creates the potential for paralyzing terror. This terror is managed through a cultural anxiety-

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buffer, consisting of (a) the person's individualized version of the cultural worldview, defined as a set of benign concepts for understanding the world and one's place in it, a set of standards through which one can attain a sense of personal value, and the promise of literal and/or symbolic immortality to those who live up to the standards of value (meaning); and (b) self-esteem, defined as a sense of personal value that is attained by believing that one is living up to the standards of worth that are part of the cultural worldview (value). Because of the critical role these two structures play in controlling anxiety, a great deal of the individual's behavior is directed toward their maintenance and defense.

This theory has received support from research conducted to test two general hypotheses (for a review of this research, see Solomon, Greenberg, & Pyszczynski, 1994). The anxiety-buffer hypothesis states that if a psychological structure functions as an anxiety buffer, then strengthening that structure should cause one to react with less anxiety and defense in response to threats, whereas weakening that structure should increase such reactions. Consistent with this hypothesis, studies have shown that when self-esteem is increased, subjects exposed to threatening stimuli exhibit less self-reported anxiety, physiological arousal, and defense in response to threats unrelated to the self-esteem induction, such as vivid scenes of death or painful electric shocks (Greenberg et al., 1993; Greenberg, Solomon, et al., 1992). More recently, it has also been shown that subjects who have recently affirmed the validity of an important aspect of their worldviews are less prone to exhibit both physiological and self-report signs of anxiety in response to death-related stimuli than those who have recently refuted an important aspect of their worldviews (Pyszczynski et al., 1994). This last study demonstrates that faith in the worldview is indeed important for assuaging mortality concerns.

The mortality salience hypothesis states that because the cultural anxiety-buffer serves to manage concerns about death, when mortality is salient, people are especially motivated to maintain its integrity, responding in an especially positive manner to anyone who supports it and responding in an especially negative manner to anyone who threatens it. Support for this proposition has been obtained in a series of studies showing that thoughts of one's own mortality lead to especially favorable reactions to those who validate one's worldview and to especially unfavorable reactions to those who challenge it; we term this *worldview defense* (e.g., Greenberg et al., 1990; Greenberg, Simon, et al., in press; Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992; Ochsmann & Reichelt, 1994; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). These studies have demonstrated this effect for a variety of aspects of cultural worldviews (moral standards, religious beliefs, na-

tionalistic attitudes) and for a variety of ways that other people can impinge on them (behaving contrary to cultural standards, verbal criticism of cultural beliefs and values, simple membership in a different cultural group).

Comparison conditions and auxiliary measures in these studies indicated that these effects do not result from negative affect, heightened self-awareness, physiological arousal, or the priming of cultural values (all of which could be viewed as potential unintended consequences of the mortality salience induction). In addition, the effects of thoughts about one's own mortality have been compared with those of thoughts about an upcoming exam, giving a speech in front of a large audience, intense pain, general worries about life after college, an important failure, and an actual failure experience. In these studies, mortality salience consistently led to more worldview defense than any of the other treatments, in spite of the fact that some of these treatments produced measurable increases in negative affect (Greenberg, Pyszczynski, Solomon, Simon, & Breus, in press; Greenberg, Simon, et al., in press; Harmon-Jones et al., 1994). These findings provide converging support for the proposition that the increased worldview defense produced by thoughts about one's mortality results specifically from the salience of death and not from the salience of aversive events in general (see Solomon et al., 1994, for a review of these studies).

Terror Management and Mild Depression

From the perspective of terror management theory, many psychological disturbances result from difficulties in maintaining the effective functioning of either or both components of the cultural anxiety-buffer (Hamilton, Greenberg, Pyszczynski, & Cather, 1993; Solomon et al., 1991a, 1991b). Clinical observations and research suggest that depression involves difficulties in maintaining faith in the cultural worldview (e.g., Becker, 1964; Frankl, 1969; Yalom, 1980). For example, Crumbaugh (1968) reported a strong association of high scores on the Depression subscale of the Minnesota Multiphasic Personality Inventory with low scores on the Purpose-in-Life Test, a test designed to assess faith in a meaningful view of life. More recently, Emmons (1992) showed that depression is associated with consideration of abstract concerns, such as questioning the meaning of life and the value of society. In addition, Kunzendorf and Maguire (1994) reported a correlation between depression and a belief that life has no meaning.

This research indicating that depressed persons question the meaningfulness of life, in conjunction with the terror management proposition that cultural worldviews provide such meaning, suggests that depressed individuals have tenuous faith in their cultural worldviews. This tenuous faith should make depressed individuals par-

ticularly vulnerable to reminders of their mortality. Because such individuals are less well protected from mortality concerns, when confronted with their mortality, they should need to bolster their existing defenses even more strongly than people with a strong cultural anxiety-buffer. If this analysis is correct, then mildly depressed individuals should respond to mortality salience with even greater defense of the worldview than has been shown with normal or nondepressed samples.

An alternative hypothesis could also be generated, but it seems less likely from a terror management perspective. Specifically, mildly depressed individuals may actually fail to defend their worldviews following mortality salience because the faith in their worldviews is weak and does not serve them well. However, terror management theory argues that some protection from mortality concerns is necessary. Therefore, depressed individuals would only be expected to fail to defend their worldviews if they had abandoned them completely.

Perhaps this would be the case for severely (psychotically) depressed individuals, but it is highly unlikely to be the case for the mildly depressed college samples that, for ethical and practical reasons, were used as subjects in these studies. These subjects were still participating in the dominant American worldview; they were getting up in the morning, getting dressed, going to classes, answering their telephones, and even fulfilling their introductory psychology research requirements. Thus, just as the proverbial ship seeks any port in a storm, these subjects, when confronted with mortality, are likely to rely on and strenuously defend their American worldview.

EXPERIMENT 1

To test this hypothesis, we conducted two experiments in which mildly depressed and nondepressed college students thought about either their own mortality or a neutral topic (watching television) and then read and evaluated essays that either supported or threatened aspects of their worldviews. In Experiment 1, as in several previous studies (Greenberg, Simon, et al., 1992), we exposed mildly depressed and nondepressed American subjects to a mortality salience or control questionnaire and then had them read a pro-U.S. and an anti-U.S. essay. We used favorability of reactions to the pro-U.S. and anti-U.S. targets as indicators of worldview defense.

Method

Subjects. The participants were 21 male and 26 female undergraduates selected on the basis of their scores on the Beck Depression Inventory (BDI; Beck, 1967), administered at a mass testing session at the beginning of the semester and again at the beginning of the experimental session. Subjects who scored 0-3 on this measure

were categorized as nondepressed ($M = 1.21$), and subjects who scored 10 and above were categorized as mildly depressed ($M = 17.39$). For ethical reasons, subjects who reported any suicidal ideation were not selected. Data from seven subjects whose BDI scores at the time of the experimental session no longer fit these cut-off points were not used.

Procedure. Subjects were run in homogenous groups (mildly depressed or nondepressed) of four to six persons in a 2 (Mildly Depressed vs. Nondepressed) \times 2 (Mortality Salience vs. Control) factorial design. Experimenters were blind to both depression and mortality salience grouping variables. The first experimenter explained to subjects that they would participate in two unrelated studies. Study 1 was described as an investigation of the relationship between personality traits. Each subject received a packet of questionnaires, which consisted of the BDI, two filler questionnaires, the mortality salience or the control treatment, and the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988).

The mortality salience manipulation was the same as that used in previous studies (e.g., Greenberg et al., 1990; Greenberg, Simon, et al., 1992). It consisted of two open-ended questions asking subjects to contemplate their own mortality. The control questionnaire asked subjects to respond to parallel questions about watching television.

After subjects completed this packet of questionnaires, the experimenter collected the packets, whereupon a second experimenter entered the room to conduct Study 2. The second experimenter told subjects that this study was designed to examine how Americans react to foreign impressions of the United States and that they would read and react to two such essays so that a paper summarizing American reaction to such impressions can be prepared.

All subjects received the same pro-U.S. and anti-U.S. essays, counterbalanced for order. These essays and the measures described below were used by Greenberg, Simon, et al. (1992). The pro-U.S. essay focused on the freedom and opportunities available to all people in the United States, whereas the anti-U.S. essay focused on the lack of opportunities available to those who are not wealthy. These essays were handwritten, and each had the same number of grammatical errors. Following each essay was a five-question assessment of it. The questions assessed how valid, biased, and well written the subjects thought the essays were and how much subjects thought they would like the author and how interested they would be in meeting the author (rating were made on scales from 1 to 9; higher numbers indicated a more positive evaluation). To support the cover story, subjects were asked after completing these questions to briefly write down their reactions to each essay; most subjects

wrote one sentence or less. Then, subjects were asked to rate the target from 1 (*Not at all*) to 9 (*Extremely*) on a set of 30 traits (e.g., ignorant, honest, knowledgeable, ungrateful). After subjects completed these questionnaires for both targets, they were thoroughly debriefed.

Results¹

Three measures of response to the essays were extracted from the data. First, a principle components factor analysis with varimax rotation conducted on the evaluation items (the primary dependent measure) revealed one factor that included all items except how well written the essay was. The other four items had loadings greater than .50 on this factor and were combined to create an evaluation index (Cronbach's alpha = .92).² Second, the favorability of subjects' open-ended responses concerning their reactions to the essays was rated, from 1 (*Very unfavorable*) to 9 (*Very favorable*), by two independent judges who were blind to conditions; high interrater reliability was found, $r = .91$. This rating for each target was used as an open-ended favorability rating. Third, a principal components factor analysis was performed on the trait rating items. Although this analysis yielded four significant factors, no obvious conceptual distinctions could be made between these factors. Therefore, a composite index of favorability of trait ratings was computed by subtracting the sum of the negative trait ratings from the sum of the positive trait ratings (Cronbach's alpha = .92).³

A 2 (Depression) \times 2 (Mortality Salience) \times 2 (Target: Anti-U.S. vs. Pro-U.S.) MANOVA, with the latter factor treated as a repeated measure, performed on the evaluation, open-ended, and trait measures revealed the expected three-way interaction, $F(3, 39) = 3.05, p < .05$. Separate ANOVAs were then performed on each measure.

Evaluations of the targets. A 2 (Depressed vs. Nondepressed) \times 2 (Mortality Salience vs. Television Control) between-subjects \times 2 (Target) within-subjects ANOVA conducted on the target evaluation composite revealed a main effect for position, $F(1, 43) = 82.27, p < .001$, which indicated that subjects preferred the pro-U.S. target over the anti-U.S. target. This effect was qualified by a two-way Mortality Salience \times Target interaction, $F(1, 43) = 35.95, p < .001$, replicating the usual mortality salience effect (means are displayed in Table 1), and the predicted three-way interaction between level of depression, mortality salience, and target evaluation, $F(1, 43) = 9.53, p < .01$ (means are displayed in Table 2). Separate two-way ANOVAs within the nondepressed and mildly depressed samples revealed a very strong mortality salience by target interaction in the depressed sample, $F(1, 20) = 58.18, p < .001$, but only a marginal interaction in the nondepressed sample, $F(1, 23) = 3.50, p < .075$.

TABLE 1: Cell Means for the Mortality Salience \times Target Interaction, Experiments 1 and 2

	<i>Mortality Salience</i>	<i>Control</i>
Experiment 1		
Evaluations		
Anti-U.S. target	3.33 _c	4.80 _b
Pro-U.S. target	6.65 _a	5.48 _b
Open-ended responses		
Anti-U.S. target	3.59	4.22
Pro-U.S. target	7.00	6.04
Experiment 2		
Evaluations		
Worldview-threatening target	2.57 _c	3.90 _d
Worldview-supportive target	7.39 _a	5.49 _b

NOTE: Means for evaluations and open-ended responses could range from 1 to 9; higher numbers indicate greater favorability. Means within each evaluation measure that do not share a common subscript differ at $p < .05$.

Pairwise comparisons in the control condition revealed that nondepressed subjects evaluated the pro-U.S. target significantly more positively than the anti-U.S. target, $t(43) = 2.54, p < .05$, but mildly depressed subjects did not, $t(43) < 1$. However, nondepressed and mildly depressed subjects did not differ significantly in their reactions to either the pro- or anti-U.S. targets, both $t(43) < 1$. In contrast, when mortality was salient, both nondepressed and mildly depressed subjects evaluated the pro-U.S. target more positively than the anti-U.S. target, $t(43) = 5.47, p < .001$, and $t(43) = 9.77, p < .001$, respectively. Moreover, when mortality was salient, mildly depressed subjects evaluated the pro-U.S. target more favorably than did nondepressed subjects, $t(43) = 2.43, p < .05$, and evaluated the anti-U.S. target more negatively than did nondepressed subjects, $t(43) = 2.00, p = .05$. Mildly depressed subjects thus did not differ significantly from the nondepressed in the control condition but exhibited stronger worldview defensive reactions to both targets than nondepressed subjects when mortality was salient.

Open-ended responses. A 2 (Depression) \times 2 (Mortality Salience) \times 2 (Target) ANOVA, with the latter factor treated as a repeated measure, performed on responses to the open-ended items revealed a main effect for target, $F(1, 41) = 38.85, p < .001$, and a marginally significant Mortality Salience \times Target interaction, $F(1, 41) = 3.82, p < .06$, which paralleled the mortality salience effect for the evaluation composite (see Table 1). Although the three-way interaction was not significant, $F(1, 41) = 1.35, p < .25$, as may be seen in Table 2, the pattern of means was roughly similar to the interaction effect obtained with the favorability composite; mildly depressed subjects exhibited the most pro-U.S. bias in the

TABLE 2: Cell Means for the Depression \times Mortality Salience \times Target Factorial, Experiment 1

	<i>Mortality Salience</i>		<i>Control</i>	
	<i>Mildly Depressed</i>	<i>Nondepressed</i>	<i>Mildly Depressed</i>	<i>Nondepressed</i>
Evaluations				
Anti-U.S. target	2.91 _f	3.75 _e	4.93 _d	4.67 _d
Pro-U.S. target	7.16 _a	6.13 _b	5.18 _{cd}	5.77 _{bc}
Open-ended responses				
Anti-U.S. target	3.40	3.75	4.36	4.08
Pro-U.S. target	7.30	6.75	5.64	6.42
<i>n</i>	11	13	11	12

NOTE: Means for evaluations and open-ended responses could range from 1 to 9; higher numbers indicate greater favorability. Means within the evaluation measure that do not share a subscript differ at $p = .05$.

mortality-salience condition and the least pro-U.S. bias in the control condition.

Trait ratings. A 2 (Depression) \times 2 (Mortality Salience) \times 2 (Target) ANOVA, with the latter factor treated as a repeated measure, performed on the trait rating composite revealed a significant main effect for essay position, which indicated that subjects rated the anti-U.S. target less positively than the pro-U.S. target, $F(1, 43) = 7.08, p = .01$. No other effects approached significance.

The relationship between affect and target favorability. Separate 2 (Depression) \times 2 (Mortality Salience) ANOVAs were performed on the Positive Affect and Negative Affect scales from the PANAS. A significant main effect of depression was found on negative affect, $F(1, 42) = 23.05, p < .0001$, which indicated that, consistent with their classification, mildly depressed subjects reported greater negative affect than did nondepressed subjects.⁴

An ANCOVA was conducted with positive and negative affect scores as covariates to determine whether the effects on evaluation of the essays were mediated by any affective consequences of mortality salience.⁵ Neither the positive nor negative affect covariate was statistically significant, and the critical three-way interaction remained significant when affect was covaried out, both $ps < .01$. These findings indicate that, as in prior research, affect did not mediate the effects of mortality salience on target favorability for either mildly depressed or nondepressed subjects.

Discussion

The results for the evaluation composite indicate that in the absence of a mortality salience induction, mildly depressed subjects were, if anything, a little less biased in favor of the pro-U.S. essay than were the nondepressed subjects. This is consistent with the idea that depressed individuals have tenuous faith in their worldviews, and it could also be viewed as consistent with a fairly large literature documenting a variety of domains

in which mildly depressed subjects do not exhibit self-serving or defensive bias (e.g., Alloy & Abramson, 1979, 1988; Alloy & Ahrens, 1987; Coyne & Gotlib, 1983). However, as expected, when confronted with a reminder of their mortality, mildly depressed subjects exhibited an even stronger pro-U.S. preference than did nondepressed subjects. Thus mortality salience led to especially strong worldview defense in mildly depressed subjects.

Although this three-way interaction was significant in the MANOVA, it did not emerge on the trait ratings and the open-ended responses. Although of some concern, there are plausible explanations for why the effects were not found on these measures. The open-ended responses were short and often vague and were elicited primarily to bolster the cover story; thus it is not surprising that they were not a particularly sensitive measure. The trait ratings included a number of traits that would be hard to assess based on the essays. In addition, it may be that once the evaluation measure was completed, there was less of a need for further worldview defense. Indeed, in past research, trait ratings following other evaluation measures have shown weaker and less consistent effects (e.g., Greenberg, Simon, et al., 1992). Clearly, the evaluation items constituted the most direct and immediate way to defend the worldview.

From the perspective of terror management theory, the intensified reactions to those who impinge on the cultural worldview reflect the greater need for the protection that the worldview provides when one is confronted with thoughts of mortality. We suggest that the emergence of worldview defense in response to mortality salience on the part of mildly depressed subjects reflects a similar process. Although these subjects may have become somewhat alienated and may have questioned their worldviews as part of their depressive episode, as noted earlier, they clearly had not completely detached from the worldview. The increased need for protection brought on by the mortality salience induction appar-

ently caused them to fall back on the worldview and to defend it vigorously.

EXPERIMENT 2

Although the results of Experiment 1 conformed closely to our expectations in showing heightened worldview defense by mildly depressed subjects, they stand in sharp contrast to a substantial body of evidence suggesting that depressed individuals are less defensive than their nondepressed counterparts (e.g., Alloy & Abramson, 1979, 1988). In addition, the usual mortality salience effect was only marginally significant among nondepressed subjects in Experiment 1. Therefore, we decided that it was important to conceptually replicate Experiment 1 to determine whether the key finding of greater worldview defense by mildly depressed subjects was reliable.

In Experiment 2, we took a more individualized approach to assessing worldview defense. Rather than assuming our subjects had a pro-American worldview, as we did in Experiment 1, we assessed a specific worldview-relevant attitude and then exposed subjects to essays supporting or challenging that attitude (similar strategies were used in Greenberg et al., 1990; Greenberg, Simon, et al., 1992). We chose attitude toward the legalization of burning the American flag because it seemed linked to central aspects of the worldview. Those who believe this act should remain legal tend to rely on the central American value of free speech; those who believe this act should be illegal tend to argue that it is an insult to the nation.

We again predicted that after mortality salience, whereas nondepressed subjects should exhibit a strong bias in favor of the worldview-supportive essay, mildly depressed subjects should exhibit even stronger worldview defense.

Method

Subjects. A total of 29 male and 32 female subjects were recruited from a mass survey session that included the BDI and a question about their attitude regarding the legality of flag burning. The BDI was also administered during the experiment. Subjects were considered nondepressed if they scored 0-4 ($M = 2.16$) and were considered mildly depressed if they scored 10 or above ($M = 17.37$) at both BDI administrations. Subjects who indicated suicidal thoughts were not recruited for this study.

Subjects were also selected for their attitudes about the legality of burning the U.S. flag. On a 9-point scale, subjects were considered against legality if they responded between 1 and 4 (1 = *Totally disagree*) and for legality if they responded between 6 and 9 (9 = *Totally agree*). Subjects who reported a 5 were not recruited.

Most subjects were against the legality of flag burning (with an overall mean of 3.45). Attitude position did not differ as a function of group or condition, all F s < 1.0.

Procedure. Subjects were run in groups of three to eight. As in Experiment 1, subjects were led to believe they were participating in two unrelated studies. Study 1 was conducted in the same manner as in Experiment 1, except that the PANAS was replaced by the PANAS-X (Watson & Clark, 1991).

After subjects completed the Study 1 materials, the experimenter introduced Study 2 in a manner similar to that used in Experiment 1, except that she explained that the essays were written by English composition students for and against particular social issues and that we were gathering reactions to these essays as a way of pretesting them for future research. The experimenter gave subjects two essays to read and evaluate; one argued that flag burning should remain legal, and one argued that it should not. Thus one essay supported an aspect of the subject's worldview, and one essay threatened an aspect of the subject's worldview. If a subject was pro flag burning, then the essay affirming that position would support the subject's worldview, whereas the essay against flag burning would threaten it, and the reverse would be true for subjects who were against flag burning.

Each essay was followed by questions used successfully in recent research (Greenberg, Simon, et al., in press). They assessed how much subjects liked the author and how intelligent and knowledgeable they thought the author was, as well as to what extent subjects agreed with the author and thought the author's position was valid. Subjects responded to these five questions on scales ranging from 1 to 9; higher numbers indicated a more positive response. Open-ended reactions were not obtained because the cover story did not call for them. Trait ratings were not collected because the most relevant traits were assessed by the first three questions of the evaluation and because a composite of subsequent trait ratings seems to be a rather insensitive measure of worldview defense. After subjects completed the second packet of questionnaires, they were fully debriefed and thanked for their time.

Results and Discussion

Evaluations of the target. A principal components factor analysis with varimax rotation conducted on the evaluation items revealed one factor; consequently, all the items were combined to create an evaluation index (Cronbach's $\alpha = .94$). A 2 (Nondepressed vs. Mildly Depressed) \times 2 (Mortality Salience vs. Control) between-subjects \times 2 (Target: Supporter vs. Threatener of an Aspect of Subjects' Worldviews) within-subjects ANOVA conducted on the favorability composite revealed a main effect for target, $F(1, 57) = 160.73$, $p < .001$, which

TABLE 3: Cell Means for the Depression \times Mortality Salience \times Target Interaction, Experiment 2

	<i>Mortality Salience</i>		<i>Control</i>	
	<i>Mildly Depressed</i>	<i>Nondepressed</i>	<i>Mildly Depressed</i>	<i>Nondepressed</i>
Worldview-threatening target	1.80 _c	3.28 _d	3.68 _d	4.12 _d
Worldview-supportive target	7.91 _a	6.91 _b	5.24 _c	5.73 _c
<i>n</i>	15	16	15	15

NOTE: Means for favorability could range from 1 to 9; higher numbers indicate greater favorability. Means that do not share a subscript differ at $p = .05$.

indicated that subjects preferred the worldview-supportive target over the worldview-threatening target. The ANOVA also revealed a Mortality Salience \times Target interaction, $F(1, 57) = 32.42, p < .001$, replicating the usual mortality salience effect, and a Depression \times Target interaction, $F(1, 57) = 4.44, p < .05$, suggesting that mildly depressed subjects were especially negative toward the threatening target.

Most important, these effects were qualified by the predicted three-way interaction between depression, mortality salience, and target, $F(1, 57) = 4.84, p < .04$. Means for the three-way interaction are displayed in Table 3. Within the nondepressed and mildly depressed subjects, we conducted separate Mortality Salience \times Target ANOVAs. For nondepressed subjects, a significant Mortality Salience \times Target interaction was found, $F(1, 29) = 4.45, p < .05$. This interaction replicates previous terror management findings (e.g., Greenberg et al., 1990). This finding was even stronger for mildly depressed subjects, $F(1, 29) = 51.63, p < .001$.

To further understand the predicted three-way interaction, we conducted pairwise comparisons. Within conditions, these comparisons revealed that even in the absence of mortality salience, both mildly depressed and nondepressed subjects evaluated the supportive target more positively than the threatening target, $t(57) = 2.69, p < .01$, and $t(57) = 2.78, p < .01$, respectively. These two groups did not differ from each other in their evaluations of either the supportive or the threatening target, $t < 1.0$.

However, when mortality was salient, mildly depressed subjects reacted with more worldview defense than did nondepressed subjects. Specifically, mildly depressed subjects evaluated the supportive essay more positively, $t(57) = 2.17, p < .05$, and the threatening essay less positively, $t(57) = 3.24, p < .01$, than did nondepressed subjects. Thus the hypothesis that mildly depressed subjects would react to mortality salience with especially strong worldview defense was supported again.

The relationship between affect and target favorability. Separate 2 (Depression) \times 2 (Mortality Salience) ANOVAs were performed on the Positive Affect and Negative Affect scales from the PANAS-X (one subject failed to

complete these measures). Significant main effects of depression were found for negative affect, $F(1, 58) = 11.64, p < .01$, and positive affect, $F(1, 58) = 4.60, p < .05$, which indicated that mildly depressed subjects reported greater negative affect and lower positive affect than did nondepressed subjects.

An ANCOVA was conducted with positive and negative affect scores as covariates to determine whether the effects on evaluation of the essays were mediated by any affective consequences of mortality salience. Neither the positive nor negative affect covariate was statistically significant, and the critical three-way interaction remained significant when affect was covaried out, both $ps < .05$. These findings indicate that, as in prior research, affect did not mediate the effects of mortality salience on target favorability for either mildly depressed or nondepressed subjects.

GENERAL DISCUSSION

The results of the present experiments demonstrate that mildly depressed individuals respond to mortality salience with even greater worldview defense than do nondepressed individuals. Based on terror management theory, we suggest that mildly depressed subjects engaged in more worldview defense in response to mortality salience because they have more tenuous faith in their worldviews and are, therefore, less buffered from mortality concerns. Consequently, when reminded of mortality, they responded by defending that which would protect them—their cultural worldviews.

Deficit in Meaning or Value?

In generating the predictions for this research, we relied primarily on the notion that the worldview, or meaning, component of terror management is weak among mildly depressed individuals. However, it is also possible that such individuals have less protection from mortality concerns because of their deficit in the other component of terror management—self-esteem (or value). Low self-esteem is considered to be one of the basic psychological symptoms of depression (e.g., see Barnett & Gotlib, 1988; Laxer, 1964; Oatley & Bolton, 1985); thus strong depressive reactions to mortality sali-

ence in these studies may be a result of low self-esteem rather than, or in addition to, tenuous faith in the worldview. We have focused primarily on the worldview deficit because, as some of us have argued elsewhere (Hamilton et al., 1993; Pyszczynski & Greenberg, 1992; Pyszczynski, Hamilton, Greenberg, & Becker, 1991), we believe that depression occurs when extreme life stress and continual difficulty sustaining self-esteem lead to a questioning of the validity of one's worldview and the meaningfulness of life.

Although we are not convinced that we currently have the measurement tools to definitively tease apart the specific contributions of deficits in meaning and value in this or other findings, we were able to consider the role of self-reported self-esteem in Study 2, because in that study (but not in Study 1), the Rosenberg (1965) self-esteem scale was administered in the mass survey session. Consistent with past research, our depressed group scored lower on self-esteem than did the nondepressed group, $F(1, 53) = 51.32, p < .01$ ($M_s = 27.1$ and 33.6 , respectively; self-esteem did not differ across conditions). However, when these self-esteem scores were used as a covariate in a three-way ANCOVA on the evaluation index, the critical three-way interaction remained significant, $F(1, 53) = 4.32, p < .05$.⁶ This suggests that the self-esteem difference did not mediate the different reactions of the mildly depressed and the nondepressed subjects to mortality salience found in Study 2. Although we would not want to argue that this finding definitely rules out any role of a self-esteem deficit, it is clearly more consistent with our emphasis on the depressive deficit in the meaning or worldview component of terror management. We hope further research will add to our understanding of the relative contributions of these two factors in this and other findings concerning depression.

Mild Versus Severe Depression

Before discussing the implications of this research, we should briefly consider the issue of generalizability to clinically depressed individuals. Our mildly depressed sample consisted of people who reported a variety of thoughts, feelings, and behaviors that are associated with the clinical disorder known as depression but who have not been diagnosed by a clinician as having depression. Thus extreme caution should be used when generalizing beyond such samples. If we are to believe their self-reports, however, the subjects in our mildly depressed groups, with mean BDI scores of 17.39 in Experiment 1 and 17.37 in Experiment 2, were clearly experiencing significant psychological difficulties. A recent review of the literature concerning the use of college student samples selected based on scores on the BDI or similar

inventories (Vredenburg, Flett, & Krames, 1993) concluded that the available evidence suggests that conclusions from studies using such samples are generally highly similar to those from studies using clinically diagnosed samples.

However, there is a conceptual basis for thinking that these results might be different with more severely depressed samples. We have argued that the especially strong levels of worldview defense that emerged among mildly depressed subjects when mortality was salient resulted from the difficulty that these individuals seem to have in sustaining meaning. This high level of worldview defense implies that the mildly depressed subjects have not completely given up on their worldviews. As noted earlier, these subjects are, in fact, continuing to participate in a meaningful worldview. In addition, as proposed by self-regulatory perseveration theory (e.g., Pyszczynski & Greenberg, 1987, 1992) and supported by research (for a review, see Barnett & Gotlib, 1988), depressed individuals tend to lack alternative sources of meaning and value. Thus it is not surprising that although they may view some aspects of the culture with cynicism or disdain, they nonetheless rely on that worldview when their need for protection is high. However, this analysis also suggests that if more severely depressed individuals have completely abandoned their cultural worldviews, they might not exhibit any worldview defense in response to mortality salience.

Brief Implications for Addressing the Problem of Depression

Because it is generally believed that having high self-esteem is adaptive and that cultural worldviews provide avenues by which individuals can obtain and maintain self-esteem, having faith in one's worldview can be viewed as critical for good mental health. Given the present findings, this suggests that mortality salience may have some use for improving psychological functioning. Specifically, as Pyszczynski and Greenberg (1992) proposed, carefully guiding mildly depressed individuals to contemplate their mortality may be a valuable tool for getting them to invest in their worldviews and to see them as meaningful, thereby making the goals and standards of their worldviews more apparent so that they can begin to find more effective ways to meet those standards.⁷ The present findings also provide some suggestive empirical support for the general contention of Yalom (1980) and other existential psychologists that consideration of abstract existential concerns may be a very useful therapeutic tactic. We hope that this research will, therefore, stimulate further investigation of the role of existential concerns in both depression and other psychological disorders. In the meantime, in support of the terror management analysis of depression, it seems

clear that in mildly depressed individuals, thoughts of mortality arouse an amplified level of worldview defense.

NOTES

1. Preliminary analyses revealed no significant effects for either gender or order of presentation of the targets for either study. Therefore, they were not included in the final analyses.
2. Analyses including the "writing" item in the composite revealed the same three-way interaction, $F(1, 43) = 9.53, p < .01$.
3. Analyses of factor scores derived from these four factors revealed the same lack of significant interactions found on the overall composite. Therefore, for simplicity's sake, we report only the results for the overall composite.
4. There was also an unexpected and inexplicable two-way interaction on positive affect, $F(1, 42) = 7.45, p < .01$; however, it was apparently spurious because it did not occur in Study 2.
5. For this and all other reported ANCOVAs, the assumption of homogeneity of regression slopes was met.
6. Four subjects did not complete the self-esteem scale during the mass survey session and so were not included in this ANCOVA. If group self-esteem means were entered for the four subjects and included in the ANCOVA, the three-way interaction would remain significant.
7. For a thorough discussion of the process of upward reverberation (consideration of existential concerns) and its role in both spontaneous recovery and psychotherapy, see Pyszczynski and Greenberg (1992, chap. 4 & 8).

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