

Terror Management and Cognitive-Experiential Self-Theory: Evidence That Terror Management Occurs in the Experiential System

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The authors hypothesized, on the basis of terror management theory and cognitive-experiential self-theory, that participants in an experiential mode of thinking would respond to mortality salience with increased worldview defense and increased accessibility of death-related thoughts, whereas participants in a rational mode would not. Results from 3 studies provided convergent evidence that when participants were in an experiential mode, mortality salience produced the typical worldview defense effect, but when participants were in a rational mode it did not. Study 4 revealed that mortality salience also led to a delayed increase in the accessibility of death-related thoughts only when participants were in an experiential mode. These results supported the notion that worldview defense is intensified only if individuals are in an experiential mode when considering their mortality. Discussion focuses on implications for understanding terror management processes.

To date, over 30 studies have supported the worldview defense hypothesis derived from terror management theory, which states that mortality salience amplifies positive reactions to those who support one's worldview and negative reactions to those who threaten one's worldview. Although these effects have been demonstrated across a wide range of social situations that impinge on the individual's cultural worldview, to progress toward a fuller understanding of these effects, researchers are now beginning to explore the conditions under which they are most and least likely to occur (Greenwald, Pratkanis, Leippe, & Baumgardner, 1986). The present research was designed to provide further insight into factors influencing worldview defense by considering the possible differences between rational and experiential thinking about the problem of death (e.g., Epstein, 1990, 1994).

Terror Management Theory and Evidence Supporting It

Terror management theory (Greenberg, Pyszczynski, & Solomon, 1986; see Solomon, Greenberg, & Pyszczynski, 1991, for a detailed exposition), derived largely from the writings of

cultural anthropologist Ernest Becker (e.g., Becker, 1973), is based on the premise that humans, like all other animals, have an instinct for survival. However, unlike other animals, humans have sophisticated cognitive capabilities, including the capacity for temporal and self-reflective thought, which provide them with an awareness of their own mortality. The conflict between our instinct for survival and our awareness of our mortality creates the potential for paralyzing terror. This terror is managed by investing in a cultural worldview, which provides an explanation for existence, a set of values that prescribe good and bad behavior, and a promise of safety and death transcendence to those who adhere to the standards of their worldview. Having faith in one's cultural worldview and meeting the standards dictated by it (self-esteem) create a cultural anxiety buffer that enables individuals to function with minimal anxiety. Consequently, a large proportion of social behavior is directed toward the maintenance of faith in one's worldview and self-esteem.

Research derived from terror management theory has focused primarily on two hypotheses: that self-esteem serves an anxiety-buffering function and that reminders of mortality increase one's commitment to one's worldview. In support of the first hypothesis, a series of studies have shown that people with either dispositionally high or experimentally enhanced self-esteem exhibit less anxiety and anxiety-related defense in response to threatening stimuli (Greenberg et al., 1993; Greenberg, Solomon, et al., 1992). High self-esteem has also been shown to decrease defensive responses to thoughts of death (Harmon-Jones et al., 1997).

In support of the second hypothesis, another series of studies have shown that, in response to reminders of mortality, people become more favorable toward those who support their worldview and more unfavorable toward those who violate it (e.g., Florian & Mikulincer, 1995; Greenberg et al., 1990; Ochs-

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mann & Reichelt, 1995; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). This effect seems to be specific to the problem of death. Neither thoughts about other aversive events, such as an important exam, public speaking, or intense pain (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994; Greenberg et al., 1995), actual or imagined failure (Harmon-Jones et al., 1997), nor contemplating the worries of life after college have led to the same biasing of evaluations. Further support for the specificity of these effects to death is provided by the fact that thinking about these other aversive events has led to an increase in negative affect, whereas the mortality salience treatments used in our studies have not. In addition, internal analyses have consistently failed to provide any indication that affect mediates worldview-defensive responses to mortality salience. The overall pattern of results from these studies suggests that negative affect is not necessary to produce mortality salience effects.

The Nature of Mortality Salience Effects

Although mortality salience effects have been demonstrated in more than 30 separate studies, relatively little is known about the thought processes involved in these effects. It seems highly unlikely that participants are consciously aware that the mortality salience questionnaire used in these studies is leading them to derogate different others. Indeed, if terror management theory is correct, mortality concerns must exert most of their influence outside of consciousness, because most people (with the possible exception of the present authors) seem to spend little time consciously contemplating the problem of death. The theory posits that mortality concerns are a superordinate nonconscious motivator of a wide range of more circumscribed and concrete goals and behaviors (for a detailed analysis of the hierarchical relationship between terror management and other motives, see Pyszczynski, Greenberg, Solomon, & Hamilton, 1990; Pyszczynski, Solomon, Greenberg, 1997; Solomon et al., 1991).

The existing evidence is consistent with the proposition that the processes underlying mortality salience effects occur outside of consciousness. Participants consistently have not reported elevated affect in response to mortality salience inductions, and, in debriefings, they have uniformly denied any awareness that the mortality salience treatment was particularly impactful or that it affected their responses to the targets they subsequently evaluated. In addition, a recent set of studies (Greenberg et al., 1994) indicated that participants who were distracted from the topic of death after a mortality salience induction engaged in heightened worldview defense, whereas participants who were forced to keep death-related themes in consciousness did not. Among participants who simply listed whatever thoughts came to mind after the mortality salience induction, a tendency to avoid further thoughts about death was associated with higher levels of worldview defense. In addition, Arndt, Greenberg, Pyszczynski, and Solomon (1996) have found that presentation of the word *death* below the subjective threshold of awareness increased both death-thought accessibility and worldview defense. These findings suggest that the problem of death exerts its effects most clearly when it is on the fringes of consciousness, that is, when it is highly accessible but outside of current focal attention.

It also seems unlikely that the psychological route from thinking about one's own death to defending one's worldview is rationally based. For example, viewing a person who praises the United States favorably and one who criticizes the United States unfavorably (or the various other types of worldview defense found in previous studies) does not logically bear on the inevitability of one's own death. Rather, terror management theory posits that the terror-assuaging function of the cultural worldview develops out of socialization experiences; because of links to parental love and protection, faith in a worldview and living up to the values of the worldview become the individual's psychological basis of security (for a more complete developmental account, see Solomon et al., 1991). Thus the mechanisms of terror management are likely to be deeply ingrained and virtually automatized, operating under neither the auspices of consciousness nor the confines of rationality (cf. Rank, 1936/1978).

Cognitive-Experiential Self-Theory

Interestingly, cognitive-experiential self-theory (CEST; Epstein, 1983, 1994) posits that a great deal of human cognitive activity is neither conscious nor logical. From this perspective, rational thinking is characteristic of only one of two distinct cognitive systems that foster human adaptation. According to Epstein (1994), the rational system "is a deliberative, effortful, abstract system that operates primarily in the medium of language" (p. 715) that is "experienced actively and consciously, and requires justification via logic and evidence" (p. 711). The experiential system, on the other hand, is "a crude system that automatically, rapidly, effortlessly, and efficiently processes information" (Epstein, 1994, p. 715) and "is experienced passively and preconsciously and is self-evidently valid" (p. 711). Because it is less effortful and more efficient, the experiential system is the default option or dominant system in most situations. The rational system is activated primarily in situations in which cues suggest the need for rational analysis. This distinction is consistent with recent neuropsychological investigations that have indicated that there are two distinct memory systems: a declarative memory system and an emotional memory system (see, e.g., LeDoux, 1994). The *declarative memory system* is posited to involve the learning and remembering of conscious events, whereas the *emotional memory system*, originating in the limbic system, is posited to involve processes operating independent of conscious awareness (LeDoux, 1994).

This distinction between rational and experiential modes of thinking is supported by research demonstrating differences in both information processing and influences on social behavior (for a recent review of evidence supporting CEST, see Epstein, 1994). Consistent with the CEST characterization of the two systems, research has shown that heuristic processing (e.g., Tversky & Kahneman, 1974) occurs primarily when participants are in an experiential mode, whereas more logic-based inferences occur when participants are in a rational mode (e.g., Epstein, Lipson, Holstein, & Huh, 1992; Kirkpatrick & Epstein, 1992). Consistent with the notion that the emotion-based experiential system is most influential in the control of ongoing social behavior, Sappington and colleagues (Sappington, Rice, Burlinson, & Gordon, 1981; Sappington, Russell, Triplett, & Goodwin,

1981) found that emotionally based beliefs exert a stronger effect on social behavior than do intellectually based beliefs (cf. Fazio, 1990).

Terror Management and the Rational Versus Experiential Distinction

If, as we have argued, fear of death is an unconscious, primal concern that stems from the individual's desire for survival, mortality salience effects should occur primarily when an individual is in an experiential mode. Rational processing may undermine the use of terror management defenses in several ways. As Epstein (1980) has suggested, thinking in a rational mode may prevent the emotional impact of a threatening issue from registering or "sinking in." Consistent with this notion, Lazarus and colleagues (e.g., Lazarus, Opton, Nomikos, & Rankin, 1965) have demonstrated that an intellectual primary appraisal of potential stressful events reduces stress reactions to such events. This is also consistent with Freud's (1936/1966) suggestion that people often actively seek to think about threatening material in an abstract, intellectual manner because this can be an effective way of detaching a stimulus from its threatening implications. Furthermore, given that there is no logical connection between the fact that one will die someday and faith in one's cultural worldview, thinking about death in a rational mode may lead one's defensive tendencies to gravitate toward more rational means of coping with mortality, such as promising oneself to quit smoking or get more exercise. Thus, we hypothesized that mortality salience is less likely to lead to increased worldview defense when participants are in a rational mode of thinking than when they are in an experiential mode of thinking.

Study 1

This hypothesis may help explain something we have observed over the last few years in conducting our mortality salience research: Whereas experiments conducted by some experimenters have consistently demonstrated mortality salience effects, those conducted by others have consistently failed to do so. Our observation of the characteristics of these experimenters suggests that informal, laid-back, comfortable experimenters obtain these effects, whereas formal, uptight, uncomfortable experimenters do not. The foregoing analysis suggests a plausible explanation for this phenomenon: Informal experimenters elicit an experiential mode of thinking in participants, whereas formal experimenters elicit a rational mode. Study 1 was designed to determine whether the formality of the experimenter does indeed affect the likelihood that mortality salience will increase defense of one's worldview.

Thus, in Study 1, we varied the appearance and manner of the same male experimenter so that he was perceived as either informal or formal. By using one of these styles, the experimenter conducted a typical mortality salience study in which participants were induced to consider either their own mortality or a neutral topic and then were asked to evaluate two foreign students, one who wrote a pro-U.S. essay and one who wrote an anti-U.S. essay (e.g., Greenberg et al., 1994; Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992). We predicted that although mortality salience would lead to exaggerated worldview

defense when the experimenter was informal, this effect would be reduced or eliminated when the experimenter was formal. We also expected that when the experimenter was informal, the open-ended responses to the mortality salience or control questionnaires would be more experiential (as opposed to rational) than when the experimenter was formal, thus revealing an effect on mode of thinking.

Method

Participants and procedure. Participants were 14 male and 33 female introductory psychology students at the University of Arizona who participated in this research for partial course credit. Participants were randomly assigned to conditions and tested in groups of 3 to 5 in a 2 (mortality salience vs. television control) \times 2 (conceptual mode: experiential, informal experimenter vs. rational, formal experimenter; between-subjects) \times 2 (anti-American vs. pro-American target; within-subjects) design. The study was modeled after previous mortality salience studies (e.g., Greenberg, Simon, et al., 1992) and was ostensibly set up as two separate short studies. Study 1 was described to participants as designed to determine "what personality traits seem to go together in people," whereas Study 2 was described as designed to determine "how Americans react to impressions of the United States made by people from foreign countries." To ensure privacy, participants worked in individual cubicles in both studies. The same experimenter ran both studies in the same session under the premise that combining the studies was an efficient use of participants' time. No participants reported being bothered by doing the two studies or reported seeing any way in which the two studies could have been linked.

In Study 1, participants completed an initial packet of questionnaires, which contained two filler personality measures followed by either the mortality salience or television-control treatment. The mortality salience treatment consisted of having participants respond to the following two open-ended questions: "Please briefly describe the emotions that the thought of your own death arouses in you" and "Jot down, as specifically as you can, what you think will happen to you physically as you die and once you are physically dead." In the control condition, parallel questions were asked with respect to watching television. More specific, participants were asked to "Please briefly describe the emotions that the thought of watching television arouses in you" and "Jot down, as specifically as you can, what you think will happen to you physically as you watch television and once you have physically watched television." This treatment was followed by the Positive and Negative Affect Schedule-Expanded Form (PANAS-X; Watson & Clark, 1991) to assess positive and negative affect.

After all participants had finished Study 1, they were told that Study 2 consisted of reading two brief essays written by foreign students about the United States and then evaluating them. Participants then returned to the cubicles and were given the materials. The essays, one pro-U.S. and the other anti-U.S., were the same as those used in several previous mortality salience studies and were counterbalanced for order of presentation (e.g., Greenberg, Simon, et al., 1992). The evaluations consisted of five questions: To what extent do you like this person? How intelligent did you think this person was? How knowledgeable did you think this person was? How much did you agree with this person's arguments? How valid did you think this person's arguments were? Responses were made on 9-point scales that ranged from 1 (*the negative response*) to 9 (*the positive response*). This was followed by an evaluation that was designed to evaluate perceptions of the experimenter as well as to check on the conceptual mode-formality manipulation. Participants responded to four questions on a 9-point scale that ranged from 1 (*the negative response*) to 9 (*the positive response*). The questions were as follows: How much did you like the experimenter? How intelligent did you think the experimenter was? How knowledgeable did you think the

Table 1
Cell Means for the Two-Way Interactions on Experimenter Liking
and the Warmth Factor for Study 1

Factor	Mortality salient		Control	
	Informal experimenter	Formal experimenter	Informal experimenter	Formal experimenter
Liking	7.73 _a	6.50 _b	6.67 _b	6.83 _b
Warmth	7.61 _a	5.58 _b	6.55 _c	5.95 _{b,c}

Note. Means with different subscripts differ at $p < .05$. Scores could range from 1 (*not at all likeable/warm*) to 9 (*totally likeable/warm*).

experimenter was? How clearly were the instructions presented? These questions were followed by the following set of trait adjectives on which participants rated the experimenter (1 = *not at all applicable*; 9 = *totally applicable*): *friendly, rude, cold, outgoing, professional, lively, distant, conservative, warm, authoritative, easygoing, uncomfortable, likeable, bored, liberal, and enthusiastic*. After participants completed the evaluations, they were thoroughly debriefed and thanked for their time.

Conceptual mode—experimenter formality manipulation. The experimenter's formality was varied by adjusting the experimenter's appearance, mannerisms, and language. In the formal condition, the male experimenter wore a lab coat over long pants and black, horn-rimmed glasses, and sat stiffly behind a desk. In the informal condition, the experimenter wore shorts, a T-shirt, and Birkenstock shoes. He also sat on the desk and used his hands expressively as he talked. The experimenter's verbal presentation was essentially the same in both conditions, with slight modifications in the informal condition to include more informalities (e.g., referring to participants as "you guys" and interspersing "okay" into various parts of the presentation).

Results

Experimenter manipulation check. As a check on our formality manipulation, we conducted Experimenter Formality \times Mortality Salience analyses of variance (ANOVAs) on participants' responses to the evaluations of experimenter items. This revealed only a significant Experimenter Formality \times Mortality Salience interaction on the liking-for-experimenter item, $F(1, 43) = 4.26$, $p < .05$ (see Table 1).¹ Pairwise comparisons revealed that mortality salient, informal experimenter participants liked the experimenter more than did participants in the other three conditions (all t s > 2.02 , p s $< .05$). There were no other significant differences for this item.

Principal components factor analysis on the trait rating for the experimenter revealed three factors: Warmth (friendly, outgoing, lively, warm, easygoing, likeable, and enthusiastic), Coldness (cold, rude, uncomfortable, and bored), and Political Orientation (liberal, conservative, and authoritative). ANOVAs performed on composites for each factor revealed a significant main effect of experimenter on Warmth, $F(1, 43) = 14.78$, $p < .002$, which was qualified by an Experimenter Formality \times Condition interaction, $F(1, 43) = 4.41$, $p < .05$ (see Table 1). Pairwise comparisons revealed greater reports of warmth for the experimenter in the mortality salient, informal experimenter condition than in any of the other three conditions (all t s > 3.14 , p s $< .01$). Control, informal experimenter participants also reported greater warmth for the experimenter than did mor-

tality salient, formal experimenter participants, $t(43) = 2.82$, $p < .05$. There were no other significant effects on this or the other two factors, Coldness and Political Orientation.

Responses to the mortality salience and control questionnaires. The open-ended responses did not differ in length as a function of condition in this or any of the subsequent studies. We content-analyzed the open-ended responses to the mortality or television questionnaire to assess whether they were predominantly experiential or rational in tone. Raters were instructed to label a response experiential if it was predominantly holistic, concrete, and focused on current feelings and experiences. An experiential response was thus one in which participants expressed current emotions, imagined what it would be like to die or watch television, or expressed their current hopes, fears, or other feelings about death or television. An example of an experiential response is the following: "I am curious—I hate to think about death. It scares me to think when we die, that could be the end of my existence—PERIOD!" or "Happiness, since the troubles of this world will no longer be a problem."

Raters were instructed to label a response rational if it was predominantly analytic, focused on logical reasoning, highly structured, and abstract. A rational tone was one in which participants rationally discussed emotions they would feel, analytically described the physical processes, or rationally discussed theories about death or television. An example of a rational tone would be,

I am curious about death, but not afraid. Everyone must die and it is a part of life. I guess the reason I am not afraid of it is that I believe that the soul lives on and from near-death stories, it sounds like death would not be scary at all

or

I wonder what is after death if anything. I wonder how my family and friends would react afterwards. I think about who would show up at my funeral.

Two independent raters, blind to the formality—conceptual mode manipulation, coded the mortality and television responses according to this distinction and achieved 96% agreement. A third

¹ Preliminary analyses for all four studies included gender of participant and order of evaluation of targets as independent variables, and neither produced significant effects in any analysis. Therefore, neither variable was used in the primary analyses.

person read the responses independently to resolve any inconsistencies.

A 2 (mortality salience vs. control) \times 2 (formality) \times 2 (experiential vs. rational response) log-linear analysis revealed a significant effect for the predicted Formality of Experimenter \times Type of Response $\chi^2(1, N = 43) = 41.12, p = .001$, with 86% (21 of 24) of the participants in the informal experimenter condition responding to the mortality salience treatment in an experiential manner and only 13% (3 of 23) of the participants in the formal condition responding in this manner. No other effects approached significance. This supports the notion that an informal experimenter elicits experiential responses to the open-ended items, whereas a formal experimenter elicits more rational responses.

Defense of worldview. As in our prior research (e.g., Greenberg et al., 1994), we computed composite measures of evaluations of the targets—reactions to the authors and reactions to the arguments made by the authors—and conducted separate 2 (condition: mortality salience vs. control) \times 2 (experimenter: informal vs. formal; between-groups) \times 2 (target: pro-vs. anti-American; within-subjects) ANOVAs on each measure. The ANOVA on the author composite revealed a main effect for the target variable, with participants preferring the pro- ($M = 6.31$) over the anti-American ($M = 3.87$) target, $F(1, 43) = 80.79, p < .001$. This was qualified by a Condition \times Target interaction, $F(1, 43) = 14.45, p < .01$. Pairwise comparisons revealed that both mortality salient and nonsalient participants were more favorable to the pro-American target than to the anti-American target, $t(43) = 8.86, p < .01$, and $t(43) = 3.59, p < .01$, respectively. However, as in previous studies, relative to control participants, mortality salient participants were more favorable than nonsalient participants in their evaluations of the pro-American target, $t(43) = 2.36, p < .05$, and more unfavorable in their evaluations of the anti-American target, $t(43) = 2.92, p < .05$.

This interaction was qualified by the predicted three-way interaction, $F(1, 43) = 10.81, p = .002$. Cell means are displayed in Table 2. Separate two-way ANOVAs conducted within each conceptual system condition revealed a strong Mortality Salience \times Target interaction in the informal experimenter condition, $F(1, 21) = 46.47, p < .001$, but no hint of this interaction in the formal experimenter condition, $F(1, 22) = 0.09, p = .76$. Pairwise comparisons revealed that, within the informal condition, mortality salience led to more favorable evaluations of the pro-American author and less favorable evaluations of

the anti-American target. In fact, the mortality salient, informal experimenter condition yielded more favorable evaluations of the pro-American target and less favorable evaluations of the anti-American target than did any other condition (all t s $> 2.03, p$ s $< .05$). No simple effects of mortality salience were found in the formal experimenter condition.

For the evaluation of the arguments composite, a 2 (mortality salience) \times 2 (experimenter; between-subjects) \times 2 (target; within-subjects) ANOVA revealed a main effect for target, $F(1, 43) = 28.24, p < .001$, which indicates that participants favored the pro-American arguments ($M = 6.32$) over the anti-American arguments ($M = 4.25$). There were no other significant effects on this measure.

Self-reported affect. A 2 (mortality salience) \times 2 (formality; between-subjects) multivariate analysis of variance (MANOVA) was conducted on the affect subscales (Fear, Hostile, Sadness, Guilty, Self-Assurance, Joviality, Attentiveness, Serenity, Surprise, Fatigue, and Shyness) of the PANAS-X (Watson & Clark, 1991) to assess whether the mortality salience treatment affected participants' self-reports of affect. No multivariate effects approached significance (all p s $> .19$). In addition, univariate ANOVAs on the most conceptually relevant types of affect—fear, sadness, and self-assuredness—also failed to reveal any effects (all p s $> .25$).

Discussion

Study 1 revealed an effect of mortality salience on worldview defense in the informal experimenter condition but not in the formal experimenter condition. We suggest that this is because the formal experimenter put participants in a rational mode of thinking, which led participants to think about death in a detached, intellectualized manner. In support of this possibility, participants' open-ended responses were predominantly rational when the experimenter was formal and predominantly experiential when he was informal. A rationally based consideration of one's mortality may be less likely to provoke increased defense of one's worldview because intellectualizing the problem of death reduces its impact.

The manipulation checks supported this interpretation of the effect of experimenter formality primarily in the mortality salient condition. In the control condition, the means were in the right direction for two of the three measures, but the differences were not significant. Although the manipulation did not seem to have much impact on liking in the control condition, it clearly

Table 2
Cell Means for the Three-Way Condition \times Experimenter \times Target Interaction
on the Author Composite for Study 1

Target	Mortality salient		Control	
	Informal experimenter	Formal experimenter	Informal experimenter	Formal experimenter
Pro-American	7.39 _a	6.14 _b	5.83 _b	5.86 _b
Anti-American	2.73 _d	3.89 _c	5.00 _c	3.89 _c

Note. Means with different subscripts differ at $p < .05$. Ratings of the author could range from 1 (totally negative) to 9 (totally positive).

led to the expected difference in the way participants responded to the open-ended control questions: 83% (10 of 12) responded to the television items in an experiential manner in the informal condition, whereas only 27% (3 of 11) responded in this manner when the experimenter was formal.

As in some of our previous research (e.g., Greenberg et al., 1994), the mortality salience effect emerged on evaluations of the target persons but not on evaluations of their essays. Perhaps once participants had reacted to the authors in a worldview-defensive manner, the worldview was sufficiently protected such that biased evaluations of the essays were not necessary. In addition, it is likely that the evaluation of the argument composite is less sensitive to mortality salience effects than the author composite, because evaluating the arguments requires a more rational type of judgment than does evaluating the author, which requires more emotional type of judgments (e.g., "How much do you like this person?").

Study 2

The formal experimenter led to both more rationally based thoughts about death and an elimination of the usual effect of mortality salience on worldview defense in Study 1. However, from this evidence we cannot be certain that the effect on worldview defense resulted from the difference in mode of thinking as opposed to some other undetected difference caused by the manipulation of experimenter formality. Therefore, in Study 2, we took a more direct approach to testing the hypothesis that reminders of death increase worldview defense when processed in an experiential mode but not when processed in a rational mode. To this end, we used written instructions to manipulate rational versus experiential mode of thinking, as has been done in previous CEST studies (e.g., Epstein et al., 1992). Participants then responded to the same questionnaires to manipulate mortality salience, read the same essays praising or criticizing the United States, and completed the same measures that we had used to assess worldview defense in Study 1. We predicted that mortality salience would lead to increased worldview defense when participants were put in an experiential set but not when they were put in a rational set.

Method

Participants. Participants were 48 (28 female and 20 male) introductory psychology students from the University of Arizona who participated to partially fulfill a course requirement. They were randomly assigned to conditions in a 2 (mortality salience treatment: mortality salience vs. control) \times 2 (conceptual system: experiential vs. rational; between-subjects) \times 2 (pro- vs. anti-American target; within-subjects) factorial design.

Procedure. The materials and procedure for this study were the same as in Study 1, except that the experimenter's style was held constant as informal, which has been the typical approach in our previous mortality salience studies. Conceptual system was manipulated by using written instructions. These instructions were patterned closely after instructions used in research testing CEST (Epstein et al., 1992; Kirkpatrick & Epstein, 1992). Experiential-mode participants were instructed that "On the following page are two open-ended questions, please respond to them with your first, natural response. We are just looking for people's gut-level reactions to these questions." Rational-mode participants were instructed that

On the following page are two open-ended questions, please carefully consider your answers to them before responding. We would like you to be as rational and analytic as possible in responding to these questions. Please be careful and thorough when considering your responses to the questions.

These instructions were followed by the mortality salience manipulation, which was identical to that used in Study 1 in which participants responded to two open-ended questions regarding either their mortality or watching television. This was again followed by the PANAS-X. Participants were then given the pro- and anti-American essays and asked to evaluate them, as in Study 1. After completing these measures, participants returned to the main room, where they were debriefed and thanked for their time.

Results

Manipulation check: Responses to the mortality salience and control questionnaires. Two independent raters with 93% agreement coded the responses to the death and television questions as either experiential or rational in tone by following the same procedure that was used in Study 1. A 2 (mortality salience vs. control) \times 2 (rational vs. experiential instructions) \times 2 (experiential vs. rational response) log-linear analysis revealed a marginal effect, $\chi^2(1, N = 46) = 44.69, p < .01$, for the expected Instruction \times Response interaction. Participants in the experiential condition tended to respond to the mortality salience treatment in an experiential manner (75% or 18 of 24), whereas participants in the rational condition did not (10% or 2 of 24). This supports the notion that the manipulation affected cognitive mode.

Worldview defense. As in Study 1, a 2 (mortality salience) \times 2 (conceptual system; between-subjects) \times 2 (target; within-subjects) ANOVA was performed on the author and essay composites. A main effect for target, $F(1, 46) = 49.72, p < .001$, a Mortality Salience \times Target interaction, $F(1, 46) = 10.92, p < .01$, and a Conceptual System \times Target interaction, $F(1, 46) = 8.73, p < .01$, were found on the author composite. The main effect for target indicated that participants generally rated the pro-American target more favorably ($M = 6.12$) than the anti-American target ($M = 3.79$). The Mortality Salience \times Target interaction reflected the typical pattern of stronger pro-American bias in the mortality salient condition than in the control condition. The Conceptual System \times Target interaction also reflected a stronger pro-American bias for participants in an experiential mode than for participants in a rational mode.

These effects were qualified by the predicted Mortality Salience \times Conceptual System \times Target interaction, $F(1, 46) = 10.20, p < .001$. Cell means are displayed in Table 3. Separate two-way ANOVAs conducted within each conceptual system condition revealed a strong Mortality Salience \times Target interaction in the experiential-mode condition, $F(1, 21) = 19.67, p < .01$, but no hint of this interaction in the rational-mode condition, $F(1, 21) = .01, p = .94$. Pairwise comparisons revealed that, within the experiential-mode condition, mortality salience led to more favorable evaluations of the pro-American target and less favorable evaluations of the anti-American target. Indeed, the mortality salient experiential conditions yielded more favorable evaluations of the pro-American target and less favorable evaluations of the anti-American target than did any other condition (all t s $> 2.14, p$ s $< .05$).

Table 3
Cell Means for the Three-Way Condition × Conceptual Mode × Target Interaction on the Argument and Author Composites for Study 2

Target	Mortality salient		Control	
	Experiential instructions	Rational instructions	Experiential instructions	Rational instructions
Author composite				
Pro-American	7.64 _a	5.67 _b	5.73 _b	5.44 _b
Anti-American	2.22 _c	4.29 _d	4.58 _d	4.13 _d
Argument composite				
Pro-American	8.00 _a	5.57 _b	5.95 _b	5.73 _b
Anti-American	1.75 _c	4.14 _d	4.00 _d	4.50 _d

Note. Means with different subscripts differ at $p < .05$. Ratings of the author and the arguments could range from 1 (*totally negative*) to 9 (*totally positive*).

For the evaluation of the arguments composite, the ANOVA revealed a main effect for target, $F(1, 46) = 54.16, p < .001$, which indicated that participants favored the pro-American arguments ($M = 6.31$) over the anti-American arguments ($M = 3.60$). There were also two two-way interactions, one for Mortality Salience × Type of Argument, $F(1, 46) = 9.27, p < .01$, and one for Conceptual Mode × Type of Argument, $F(1, 46) = 14.11, p < .01$. The pattern of means was similar to that found on the author composite.

These effects were again qualified by the predicted three-way interaction, $F(1, 46) = 7.71, p < .001$. Separate two-way ANOVAs conducted within each conceptual system condition again revealed a strong Mortality Salience × Target interaction in the experiential mode condition, $F(1, 21) = 22.81, p < .01$, but no hint of this interaction in the rational-mode condition, $F(1, 21) = .03, p = .86$. Pairwise comparisons revealed that, within the experiential-mode condition, mortality salience led to more favorable evaluations of the pro-American arguments and less favorable evaluations of the anti-American arguments. The mortality salient experiential condition once again yielded more favorable evaluations of the pro-American arguments and less favorable evaluations of the anti-American arguments than did any other condition (all $t_s > 2.66, p_s < .05$).

Self-reported affect. A 2 (mortality salience) × 2 (conceptual system) between-subjects MANOVA was conducted on the affect subscales of the PANAS-X (Watson & Clark, 1991) to assess whether the mortality salience treatment affected participants' self-reports of affect. No multivariate effects approached significance (all $p_s > .30$). As in Study 1, univariate ANOVAs on fear, sadness, and self-assuredness again failed to yield any effects approaching significance (all $p_s > .25$).

Discussion

The results of Study 2 provide strong converging support for the hypothesis that mortality salience effects occur when participants are in an experiential mode of responding but not when they are in a rational mode. These results conceptually

replicate the findings of Study 1 with a more direct manipulation of conceptual mode. In this study, the effects also occurred on the argument composite. Perhaps this happened because the direct experiential instructions were more effective than the informal experimenter in keeping the participants experiential through the argument ratings. The convergence in findings across studies, coupled with the effect of both manipulations on the content of participants' responses to the mortality salience items, suggests that it is mode of thinking rather than some other aspect of the inductions that led to these effects. These findings suggest that approaching the problem of death in a rational mode undermines the increase in worldview defense that such encounters typically produce.

Study 3

One issue not clarified by Study 1 is exactly when participants need to be experiential for mortality salience effects to emerge. There seem to be three possibilities. One is that they need to be experiential when considering their own mortality; when writing about one's mortality in a rational, intellectualized way, the individual may be insulated from the threatening nature of these thoughts.

Another possibility is that it doesn't matter what mode the participants are in when contemplating their mortality, but it matters what mode they are in when evaluating the targets. It is possible that mortality salience will always arouse terror management concerns but that these concerns will only affect evaluations of the targets when participants are responding to the targets experientially rather than rationally.

The third possibility is that participants have to be in an experiential mode both when contemplating their mortality and when responding to the targets. An experiential consideration of mortality may be necessary to arouse terror management concerns, and yet, if people switch to a rational mode when evaluating the targets, their evaluations may not be biased by that concern. However, if they remain in an experiential mode, the motivational concern should dominate their reactions to the targets, manifested by increased pro-American bias.

To test among these possibilities, a third study was conducted in which we created four conditions by including instructions manipulating rational-experiential mode both directly before the mortality salience questionnaire and again directly before the opportunity to evaluate the pro- and anti-American targets. We also included one television (all experiential) condition to determine whether one or more of these conditions would in fact reproduce the usual elevation in worldview defense. If worldview defense is elevated whenever the experiential instruction precedes the mortality salience treatment, the first hypothesis would be supported. If worldview defense is elevated whenever the experiential instruction directly precedes target evaluations, the second possibility would be supported. If worldview defense is only elevated when the experiential instruction is given at both junctures, then it would be clear that people have to be in an experiential mode when both contemplating their own death and evaluating the targets for mortality salience effects to emerge.

Method

Participants. Twenty-two male and 38 female undergraduate social psychology students from the University of Arizona participated as part of in-class demonstrations of contemporary social psychological research. The data of 5 participants, 2 in the television condition and 1 from three of the four remaining conditions, were dropped for reporting that they remembered the materials from participation in prior research.

Procedure. Two group sessions consisting of 25 and 40 participants, respectively, were tested by two different experimenters. Participants were randomly assigned to conditions in a 2 (experiential vs. rational mortality salience) \times 2 (experiential vs. rational target evaluation) between-subjects design with one double experiential instruction, television salience control condition. Evaluation of the pro- versus anti-American targets was again administered as a within-subject variable.²

When introducing the study, both experimenters delivered a scripted cover story explaining that they would be administering a packet of personality questionnaires commonly used in contemporary social psychological research. Participants were instructed to complete the questionnaires in the order presented and, when finished, to wait as the experimenter would then go over the materials so they "would learn about some of the materials used in social psychology research."

The materials for this study were the same as those used in Study 2, except the conceptual system manipulation preceded the evaluations of the pro- and anti-American essays. The mortality salience manipulation, identical to that used in the first two studies, was again preceded by the experiential or rational instructions that were used in Study 2. After responding to the mortality salience or control questionnaire, participants completed the PANAS-X (Watson & Clark, 1991), which was designed to assess positive and negative affect, and a filler questionnaire.

Participants then read a cover page introducing the target essays that explained an interest in "looking at how Americans react to impressions of the United States held by people from foreign countries." The cover page further explained that these evaluations would be used to help select the best essays and would be followed by another page of instructions that constituted a second conceptual system manipulation. The experiential instructions read,

On the following pages are two essays about the United States written by foreign students at the University of Arizona. Please read the following statement and then respond to it with your first, natural response. Remember, we are looking for people's gut-level reactions to the essays.

The rational instructions read,

On the following pages are two essays about the United States written by two foreign students at the University of Arizona. Please CAREFULLY consider what the authors wrote about their impressions when you evaluate the essays. Remember, we are trying to select the best essays so please be careful and thorough when considering your responses to the essays.

The essays were the same as those used in the first two studies and were counterbalanced for order of presentation. When done, participants were asked to list on the back page whether they had seen any of these materials before and if they had any ideas about what the study might be about. Participants were then thoroughly debriefed and thanked.

Results

Initial analyses included experimenter as a variable, but because no differences were found, it is not reported further.

Defense of worldview. Because the primary purpose of this study was to assess the impact of varying conceptual systems,

both pre-mortality salience and pre-target evaluation, we first performed a 2 (pre-mortality-salience conceptual system) \times 2 (pre-target-evaluation conceptual system; between-subjects) \times 2 (target; within-subjects) ANOVA on both the author and argument composites within the mortality salience conditions. On the author composite, we found a main effect for target, $F(1, 45) = 26.72, p < .001$, a pre-Mortality-Salience Conceptual System \times Target interaction, $F(1, 45) = 4.77, p < .05$, and a pre-Target-Evaluation Conceptual System \times Target interaction, $F(1, 45) = 9.54, p < .01$. The main effect for target indicated that participants generally preferred the pro-American author ($M = 5.83$) over the anti-American author ($M = 4.62$). The pre-Mortality-Salience Conceptual System \times Target interaction and the pre-Target-Evaluation Conceptual System \times Target interaction both reflected the tendency for participants who received the experiential instructions to exhibit greater pro-American bias than participants receiving the rational instructions.

These effects were qualified by a pre-Mortality-Salience Conceptual System \times pre-Target Conceptual System \times Target interaction, $F(1, 45) = 7.75, p < .01$. Cell means are displayed in Table 4. Pairwise comparisons revealed that the only condition to exhibit significantly more favorable evaluations of the pro-American target than of the anti-American target was the mortality salience condition, in which participants received both sets of experiential instructions, $t(55) = 6.82, p < .01$ (all other $ts < 1.65$). Indeed, double experiential, mortality salience participants exhibited more favorable evaluations of the pro-American target and less favorable evaluations of the anti-American target than did any condition (all $ts > 2.31, ps < .05$), with the following exception. Although the double experiential, mortality salience condition showed lower evaluations of the anti-American author than did the rational-experiential, mortality salience condition $t(55) = 4.72, p < .05$, they did not differ on evaluations of the pro-American author ($t < 1$). Additional pairwise comparisons also revealed that the rational-experiential, mortality salience condition responded with more favorable evaluations of the pro-American author than did the experiential-rational, mortality salience condition, $t(45) = 2.17, p < .05$. There were no significant differences among any of the other conditions (all $ts < 1.45$).

For the evaluations of the argument composites, the ANOVA revealed a main effect for target, $F(1, 45) = 27.19, p < .001$, which indicated that participants favored the pro-American arguments over the anti-American arguments. There was also a two-way interaction between pre-target-evaluation conceptual system and target, $F(1, 45) = 18.98, p < .001$. The pattern of means was similar to that found for the author composite.

These effects were qualified by the predicted pre-Mortality-Salience Conceptual System \times pre-Target-Evaluation Conceptual System \times Target interaction, $F(1, 45) = 9.42, p < .01$. Cell

² Only the double experiential television condition was included because findings from previous studies showed that mortality salience engenders increased cultural worldview defense when participants are in an experiential mode of processing and not in a rational mode. Thus, if any effects were to emerge within the television condition they would be expected to do so after a double experiential manipulation, thereby rendering unnecessary the inclusion of rational instructions in the television control condition.

Table 4
Cell Means for the Three-Way Pre-Mortality Salience Conceptual System × Pre-Target Conceptual System × Target Interaction (With the Dangling Television Control) on the Author and Argument Composites for Study 3

Target	Experiential mortality salience		Rational mortality salience		Control
	Experiential pre-target	Rational pre-target	Experiential pre-target	Rational pre-target	Experiential pre-target
Author composite					
Pro-American	6.51 _a	5.14 _{b,e}	6.14 _{b,c}	5.47 _{b,c}	5.33 _{b,c}
Anti-American	3.51 _d	4.81 _{b,e}	5.39 _{b,c}	4.86 _{b,e}	4.30 _{d,e}
Argument composite					
Pro-American	7.38 _a	5.04 _b	6.75 _{a,c}	5.75 _{b,c}	5.22 _b
Anti-American	3.31 _d	5.29 _b	5.25 _b	5.00 _b	4.68 _b

Note. Means with different subscripts differ at $p < .05$. Ratings of the author and arguments could range from 1 (totally negative) to 9 (totally positive).

means are displayed in Table 4. Pairwise comparisons revealed a pattern mirroring that observed on the author composite. Participants in the double experiential, mortality salience condition were the only ones to exhibit significantly more favorable evaluations of the pro-American argument than of the anti-American argument, $t(55) = 6.85, p < .01$ (all other t s < 1.12). Again, double experiential, mortality salience participants exhibited more favorable evaluations of the pro-American argument and less favorable evaluations of the anti-American argument than did any other condition (all t s $> 2.31, p$ s $< .05$), with the same exception as on the author composite. Although the double experiential, mortality salience condition showed lower evaluations of the anti-American argument than did the rational-experiential, mortality salience condition, $t(55) = 2.92, p < .05$, they did not differ on evaluations of the pro-American argument ($t < 1$). Additional pairwise comparisons again revealed that the rational-experiential, mortality salience condition responded with more favorable evaluations of the pro-American author than did the experiential-rational, mortality salience condition, $t(55) = 2.48, p < .05$. There were no significant differences among any of the other conditions (all t s < 1.48).

Because this study did not have a fully balanced design, in that there was only the one dangling control (double experiential television), we also performed a one-way 5 (conditions; between-subjects) \times 2 (target; within-subjects) ANOVA on the author and argument composites. This analysis revealed a main effect for target, $F(4, 55) = 31.14, p < .001$, and a Condition \times Target interaction, $F(4, 55) = 5.76, p < .001$, on the author composite, as well as on the argument composite, $F(4, 55) = 22.76, p < .001$, and $F(4, 55) = 7.54, p < .001$, respectively. The pattern of means parallels that found in previous analyses.

To check that the double experiential, mortality salience condition exhibited more pro-American bias than the double experiential, television condition, we examined pairwise comparisons on both the author and argument composites. Results revealed that double experiential, mortality salience participants evaluated both the pro-American author and the pro-American argu-

ment more favorably (both t s $> 2.56, p$ s $< .05$) and the anti-American argument less favorably, $t(55) = 2.21, p < .05$, but only differed marginally on evaluations of the anti-American author, $t(55) = 1.72, p < .10$. Additional comparisons also revealed that rational-experiential, mortality salience participants evaluated the pro-American argument more positively than did double experiential, television participants, $t(55) = 2.40, p < .05$, but interestingly, also evaluated the anti-American author more positively, $t(55) = 2.34, p < .05$. No other comparisons with the television condition approached significance (all t s < 1.7).

Self-reported affect. A between-subjects ANOVA with all five conditions was conducted on each of the affect subscales of the PANAS-X (Watson & Clark, 1991) to assess whether the different combinations of manipulations had any effect on participants' self-reports of affect. No effects approached significance (all F s $< 1.15, p$ s $> .33$). As in the first two studies, univariate ANOVAs on fear, sadness, and self-assuredness revealed no effects (all p s $> .25$).

Discussion

Studies 1 and 2 found that mortality salience led to increased cultural worldview defense when participants were in an experiential mode but did not do so when participants were in a rational mode. The results of the present study provide further support for the role of the experiential set in producing mortality salience effects by extending the evidence to suggest the importance of remaining in the experiential mode throughout both the contemplation of mortality and the time during which dependent measures are obtained. More specific, when participants experientially wrote about their mortality and sustained that mode throughout evaluating targets that threatened or supported aspects of their cultural worldview, increased worldview defense occurred. In contrast, when conceptual mode was switched to a rational set before evaluating the targets, increased worldview defense did not occur. It is interesting, however, that when parti-

participants rationally wrote about their mortality but then switched to an experiential set for target evaluation, there was some indication of increased worldview defense. We are, however, quite tentative in drawing inferences about this condition given that, although participants exemplified more favorable evaluations of the pro-American target, they did not show less favorable evaluations of the anti-American target.

Study 4

The findings of the three previous studies converge in demonstrating that terror management processes occur when people think about death in an experiential but not in a rational way. This suggests that rational thinking may diffuse the threatening implications of death, thereby reducing the need to increase one's level of worldview defense (cf. Freud, 1936/1966; Lazarus et al., 1965). Study 4 was designed to provide some preliminary evidence regarding this issue.

Previous studies have suggested that worldview defense occurs primarily when the problem of death is highly accessible but not in current focal attention. Greenberg et al. (1994) have shown that mortality salience leads to increased worldview defense when participants have been reminded of their mortality and then distracted from this issue and that the accessibility of death-related thoughts is higher after a distraction than immediately following a mortality salience treatment. Thus delay and distraction led to both high levels of death-related accessibility and increased worldview defense. On the basis of Martin and Tesser's (1993) research, Greenberg et al. (1994) argued that this delayed increase in accessibility resulted from perseverated concerns about the threatening nature of the prior thoughts of mortality.

This reasoning suggests that if rational thinking undermines the usual effects of mortality salience on worldview defense by diffusing the threatening nature of thinking about death, then putting participants in a rational mode should also undermine the delayed increase in death-related accessibility. To this end, we again manipulated the style and manner of the experimenter so that she was perceived as either informal or formal to test the hypothesis that whereas participants in an experiential mode (informal experimenter) will exhibit a delayed increase in death related accessibility after a mortality salience induction and distraction, participants in a rational mode (formal experimenter) will not.³ To test this hypothesis, we induced participants to think about their own mortality or about watching television and then completed an initial measure of accessibility of death-related thoughts. Participants then read a brief passage designed to distract them; this was followed by a second measure of accessibility.

Method

Participants. Nineteen male and 46 female participants took part in this study for partial course credit.

Procedure. The experimenter manipulation of conceptual mode was the same as in Study 1, except that we used a female experimenter instead of a male experimenter. The experiment was described as a single study considering the relationship among personality traits. Participants completed the same materials as in the first part of Study 1, with the following exceptions. The mortality salience manipulation was followed

by a measure of accessibility of death-related thoughts and a seven-page excerpt from a short story, *The Growing Stone* (Camus, 1957). The excerpt was descriptive, bland, and neutral in content and emotional tone. It described a man driving to a riverbank in a Brazilian forest and then described the river and surrounding environs. The excerpt also described the man's observations from a distance of three men on a raft and a ferry on the river. This was followed by a second measure of death-thought accessibility, the PANAS-X, and the experimenter evaluation form from Study 1. The two accessibility measures were counterbalanced for order of presentation. The accessibility measures consisted of having participants fill in letters to form words that could be designated either neutral or death related. For example, participants would be presented with the letters C O F F ____, which could be completed as either *coffee* or *coffin* (e.g., Bassili & Smith, 1986). For both the pre- and posttest measures, there were 6 possible death-related terms embedded in a list of 20 neutral terms. The procedure of using the two measures of accessibility and the passage from *The Growing Stone* has been used successfully to measure accessibility in the past, and results have revealed that mortality salience leads to increased accessibility of death-related thoughts only after the distraction of reading the passage (Greenberg et al., 1994; Harmon-Jones et al., 1997).

Results

Experimenter manipulation check. As a check on our experimenter manipulation, we had participants respond to the same evaluations that were used in Study 1. ANOVAs conducted on the four questions revealed a significant main effect for experimenter style on how much participants liked the experimenter, $F(1, 27) = 7.37, p < .05$. Informal experimenter participants reported greater liking for the experimenter ($M = 7.75$) than did formal experimenter participants ($M = 5.86$). There were no other significant differences for this item. There were also no significant effects for the remaining three questions of intelligence, knowledge, and clarity. These questions were followed by the trait ratings for the experimenter. A principal components factor analysis revealed a factor structure very similar to that in Study 1. Therefore, we used the same factors that we used in Study 1. An ANOVA revealed only a significant main effect for experimenter on the Warmth factor, $F(1, 27) = 58.25, p < .001$, with informal experimenter participants ($M = 6.91$) perceiving greater warmth in the experimenter than did formal experimenter participants ($M = 3.28$). For the second factor, Coldness, only a main effect for mode of experimenter was found, $F(1, 27) = 15.81, p < .05$, with formal mode participants ($M = 2.91$) reporting greater coldness for the experimenter than informal mode participants ($M = 1.59$). There were no significant effects on the Political Orientation factor.

Responses to the mortality salience and control questionnaires. We again content-analyzed the open-ended responses to assess any possible differences in the way in which partici-

³ Given the convergence between the manipulations in Studies 1 and 2, we felt that either the experimenter formality manipulation or the cognitive set manipulation could be used in Study 4. We chose the experimenter formality manipulation (a) to see if it would effectively manipulate cognitive mode with a different experimenter, a finding that would be of some interest in its own right and (b) because the formality effect has practical implications for both researchers interested in a subtle way in which cognitive mode can be manipulated and others wishing to replicate mortality salience effects.

pants responded to the open-ended questions. Two independent raters, with 94% agreement, coded the mortality salient and control responses as either experiential or rational in tone by using the procedure that was used in Study 1.

A 2 (mortality salience vs. control) \times 2 (formality) \times 2 (rational vs. experiential responses) log-linear analysis revealed only a significant Formality \times Response interaction, yielding a marginal effect, $\chi^2(1, N = 61) = 60.58, p = .001$, with 93% (30 of 32) of the participants in the informal experimenter condition responding to the mortality salience treatment in an experiential manner, whereas only 18% (6 of 33) of the participants in the formal condition responded in this manner. No other effects approached significance. This again supports the notion that an informal experimenter elicits an experiential response to mortality salience, whereas a formal experimenter elicits a more rational response.

Accessibility of death-related thoughts. A 2 (condition: mortality salience vs. control) \times 2 (formality: formal vs. informal; between-groups) \times 2 (immediate vs. delayed measure; within-subjects) ANOVA on the accessibility measure revealed a two-way Condition \times Time of Measurement interaction, $F(1, 61) = 13.02, p < .01$, as well as a two-way Mortality Salience \times Time of Measurement interaction, $F(1, 61) = 5.56, p < .01$. These effects were qualified by the predicted three-way interaction, $F(1, 61) = 15.08, p < .01$. Cell means are displayed in Table 5. Separate two-way ANOVAs conducted within each conceptual mode revealed that in the informal experimenter condition there was a significant Mortality Salience \times Time of Measurement interaction, $F(1, 29) = 24.42, p < .01$, but no hint of this interaction in the formal condition ($p > .70$). Pairwise comparisons revealed that, within the informal experimenter condition, mortality salient participants exhibited higher levels of death-thought accessibility after a delay than immediately after the induction, $t(29) = 5.86, p < .01$, and higher levels than did control participants both immediately and after a delay, $t(29) = 7.27, p < .001$, and $t(29) = 6.76, p < .001$, respectively. Accessibility did not differ over time for control participants ($t < 1$). Within the formal mode condition, there were no significant pairwise differences ($ts < 1.0$).

Self-reported affect. A 2 (mortality salience) \times 2 (conceptual system) between-subjects MANOVA was conducted on the affect subscales of the PANAS-X (Watson & Clark, 1991) to assess whether the mortality salience treatment affected participants' self-reports of affect. No multivariate effects approached significance (all $ps > .33$). As in the prior three studies, univari-

ate ANOVAs on fear, sadness, and self-assuredness did not yield any effects approaching significance (all $ps > .25$).

Discussion

Study 4 demonstrated that after mortality salience, in the experiential mode, death-related thoughts were more accessible following distraction than they were without distraction. In the rational mode, however, distraction had no effect on accessibility; it remained low. The increase in accessibility after distraction in the experiential condition is consistent with both prior terror management research and Epstein's (1994) analysis of the divergent manner in which the experiential and rational systems respond to significant events that are often outside of conscious awareness. More specific, the results of this study are highly compatible with Epstein's (1994) proposal that in the experiential mode, people respond to significant emotional influences, such as threats, by searching through memory for events or the "emotional accompaniments" related to the impetus. Applied to the present data, such a search may have increased the accessibility of death-related thoughts. In the rational system, on the other hand, Epstein proposed that threats that are outside of conscious awareness are not registered; consequently, people may fail to conduct a search that leads to heightened accessibility. In this case, therefore, accessibility of relevant thoughts would remain low.

There was one minor inconsistency between Studies 1 and 4. Whereas in Study 1 there was a significant Mortality Salience \times Conceptual Mode interaction on the warmth rating of the experimenter, this did not replicate in Study 4. Although a different experimenter was used, the manipulation of rational and experiential was virtually identical, thus suggesting that the increased liking in only the mortality salient condition of Study 1 was spurious or due to some incidental aspect of that study.

General Discussion

The findings of the present studies provide converging support for the proposition that mortality salience effects occur primarily when people are in an experiential mode of thinking. Whereas strong mortality salience effects, similar to those found in previous studies, emerged in response to an informal experimenter who elicited experiential responses in Study 1 and in response to an instructional set that encouraged participants to use their intuitive experiential responses in Studies 2 and 3, no such

Table 5
Cell Means for the Three-Way Condition \times Conceptual Mode \times Time of Accessibility Interaction for Study 4

Time	Mortality salient		Control	
	Informal experimenter	Formal experimenter	Informal experimenter	Formal experimenter
Time 1 (no distraction)	1.20 _a	1.05 _a	1.06 _a	0.94 _a
Time 2 (after distraction)	3.47 _b	1.27 _a	0.88 _a	1.09 _a

Note. Means with different subscripts differ at $p < .05$. Scores could range from 0 (no death-related terms used) to 6 (all possible death-related terms used).

effects of mortality salience were found in response to a formal experimenter or an instructional set that encouraged a careful, rational response to the mortality salience treatment. These findings suggest that mortality salience effects may be limited to situations in which the experiential conceptual system is dominant.

This is an important qualification of prior mortality salience effects and indicates a critical condition that must be created by other researchers interested in replicating the effects. However, this qualification may not be all that limiting in the world outside the laboratory. Epstein (1980) argued that the experiential system is usually the default system for most of the tasks of living; the rational system is believed to take over only when the situation demands a careful, logical analysis. The fact that mortality salience effects have been demonstrated in over 30 separate studies with no explicit induction of an experiential set, both by us and others in Germany (Ochsmann & Mathay, 1996) and in Israel (Florian & Mikulincer, 1995), is consistent with this view. In addition, the fact that mortality salience effects have also been found outside of the laboratory, both in response to questions about death that municipal court judges answered in their chambers prior to setting bond for a hypothetical prostitute (Rosenblatt et al., 1989, Study 1) and in response to passing a funeral parlor on city streets in both Germany and in the United States (Pyszczynski et al., 1996), also suggests that an experiential mode seems to be a common way of functioning in daily life.

Mortality Salience, General Threat, and Anxiety

Terror management theory posits that the problem of the knowledge of mortality has unique psychological consequences because death is inevitable and ultimately thwarts the basic desire for self-preservation. Thus we have argued that this existential threat operates unlike more circumscribed, time-limited threats. Certainly other threats, such as economic pressures (see e.g., Sales, 1972, 1973) and especially threats to self-esteem, may, under certain circumstances, intensify intergroup bias (e.g., Cialdini & Richardson, 1980; Meindl & Lerner, 1984). However, under other circumstances, self-esteem threat has failed to increase intergroup bias (e.g., Hogg & Abrams, 1990; Crocker, Thompson, McGraw, & Ingerman, 1987; Meindl & Lerner, 1984).

As noted in the introduction, when we have compared making people think about their own mortality with making people think about other potentially aversive future events (e.g., giving a speech in public, failing, dental pain, worries after college, one's next important exam) or even giving participants a failure experience that reduces self-esteem, only mortality salience has led to an increase in pro-American bias in reactions to essays by foreign students (Greenberg et al., 1994; Greenberg et al., 1995; Greenberg, Simon, Arndt, Pyszczynski, & Solomon, 1996). Recently, we have also found that the subliminal presentation of the word *death* or *dead* also leads to increased worldview defense, whereas the subliminal presentation of the word *pain* does not (Arndt, Greenberg, Pyszczynski, et al., 1996). Thus, existing evidence suggests that the particular kinds of defensive reactions we have been assessing are not aroused by other types of threats. Other research has indicated that these effects are specifically

linked to heightened accessibility of death-related constructs (for an overview of this work, see Greenberg, Solomon, & Pyszczynski, in press). Of course, we cannot at this point be definitive in arguing that these effects are unique to mortality salience, because future research may reveal other threats that do lead to the kinds of effects we have found for mortality salience.

A related issue concerns the role of anxiety in these effects. In each of these four studies, there was no evidence that mortality salience, whether considered experientially or rationally, aroused anxiety as measured by the Fear subscale of the PANAS-X. In addition, inspection of the within-cell correlations between fear scores and extent of positive reactions to the pro-American essay and negative reactions to the anti-American essay within the conditions that yielded elevated pro-American bias found no evidence that level of anxiety mediated those reactions (all r s < .15, *ns*). Similar results have been found in approximately 30 other mortality salience studies. These findings suggest that the effects of mortality salience are not mediated by increases in anxiety.

Of course, it is certainly conceivable that these null results reflect either problems with our measures or a denial or suppression process in which participants are failing either to acknowledge or to be consciously aware of their anxiety. These are fascinating possibilities that are worth further consideration in future work. However, certain evidence leads us to think that the mortality salience effects occur without any measurable anxiety and that anxiety reactions will not necessarily produce these effects. In two studies, we found that although contemplation of one's next important exam and future worries after college produced self-reported negative affect, they did not reproduce the effects of mortality salience (Greenberg et al., 1995). Two studies using physiological indexes (heart rate, electrodermal activity, blood pulse volume) failed to find any evidence that mortality salience increased anxiety (Arndt, Greenberg, & Harmon-Jones, 1996; Rosenblatt et al., 1989). Two recent studies that used subliminal death primes also failed to find any increase in anxiety (Arndt, Greenberg, Pyszczynski, et al., 1996). Two additional studies assessed the possibility of delayed increases in anxiety, but didn't find any such evidence (Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1996). Thus, the role of experienced affect in these effects, if any, remains to this point a mystery. Perhaps these defensive reactions are so ingrained in people that they occur virtually automatically in anticipation of the potential for affect.

Terror Management, the Experiential Self-System, and Rational Thought

The present findings locate terror management processes in the experiential rather than rational part of the self-system. This fits well with both our theoretical analysis of terror management processes and with other empirical evidence regarding mortality salience effects. Terror management theory posits a developmental process whereby the child learns to control anxiety by investing in, and living up to, the values of an externally imposed security base that begins with the parents but broadens to the larger constructs provided by the culture. Thus, terror management evolves out of a prelogical experiential process that begins

long before the full rational capabilities of the individual have developed. Although the belief that one is a valuable member of a meaningful culture offers no rational or logical solution to the problem of the inevitability of death, the psychological connection between meaning and value and the problem of our vulnerability and mortality are rooted in the early childhood experiences through which we learn to cope with the deep-seated and intense anxieties of things beyond our control.

In addition, thinking about death in a rational manner is not likely to be as threatening as thinking about death in an experiential manner. Such intellectualization may provide the psychological distance necessary to contemplate death-related thoughts with relative equanimity. This is by no means a novel idea. In the mid-1960s, Lazarus and colleagues (e.g., Lazarus et al., 1965) found that an intellectual primary appraisal of potential stressful events can effectively reduce stress reactions to such events. In a similar manner, the present research suggests that it is possible to consider death in an intellectual manner that minimizes or eliminates the need for defense or rumination. Of course, Freud (1936/1966) argued that intellectualization can itself be a form of defense, a way to detach a stimulus from its threatening implications. Perhaps rationally contemplating death entails merely being in a certain cognitive mode at that time; however, it is also possible that people sometimes purposefully shift to such a mode to minimize the impact of thoughts of mortality.

Regardless of whether circumstances simply lead people to respond rationally or they choose to intellectualize as a defense, the present findings show that people appear able to engage in judgments and actions not driven by their defensive existential concerns when they are in a rational mode and under the deliberate control of consciousness. This is a hopeful note in that it suggests people can at least temporarily get beyond defensiveness; unfortunately, when people are relaxed and their emotions are engaged, the experiential mode is likely to be activated, and defensive processes are likely to occur (e.g., Epstein, 1980, 1985, 1990, 1991).

In support of the connection between the experiential mode and defensive responses, Study 4 of the present research provides evidence complementary to the recent findings of Greenberg et al. (1994) that mortality salience effects are strongest after a delay, when death thoughts are accessible but outside consciousness (perhaps in what Freud termed the pre-conscious). This fits well with the idea that terror management occurs in a part of the cognitive system not controlled by the rational thought processes of consciousness. Based on their findings, Greenberg et al. (1994) argued that there are actually two responses to mortality salience. The initial response is not to the existential problem of mortality but to the existence of such unpleasant thoughts in consciousness. This response tends to involve either simply suppressing and distracting oneself from these thoughts or by first minimizing one's perceived vulnerability to death, perhaps by trying to convince oneself that it is a remote problem that one will not have to deal with for a long time (e.g., "Not me, not now," Chaplin, 1995), and then shifting attention elsewhere.

A number of findings support the existence of this initial response (for an overview of this evidence, see Greenberg, Solomon, & Pyszczynski, in press). Studies have shown that people

try to deny their vulnerability to a short life expectancy when the issue is raised (e.g., Greenberg et al., 1993; Quattrone & Tversky, 1984). In addition, Greenberg et al. (1994) found that people quickly distract themselves from thoughts of death following the mortality salience treatment; specifically, they found that accessibility of death-related thoughts is low directly after mortality salience treatment and that, according to a thought-sample measure, spontaneous thoughts quickly shift to mundane matters. Recently, Arndt, Greenberg, Solomon, et al. (1996) found evidence indicating that the initially low death-thought accessibility following mortality salience results from an effortful process of suppression. Greenberg et al. (1996) also found that mortality salience leads to an immediate increase in denial of vulnerability to a short life expectancy.

This initial response takes care of the conscious problem but does not address the deeper problem that resonates from the experiential contemplation of mortality. The deeper problem of the ever-present implicit knowledge of the inevitability of death is addressed by sustaining faith in a cultural worldview and a valued place within that worldview (cf. Greenwald & Banaji, 1995, for a discussion of the role of implicit attitudes in behavior). Thus, the second response to mortality salience should be bolstering the worldview to serve the unconscious need for terror management. In support of such a terror management response, Greenberg et al. (1994) found that once the consciousness of these thoughts is addressed and removed, the accessibility of death-related thoughts increases and worldview defense occurs. These findings converge with the present results in indicating that the terror management strategy of defending the worldview occurs in a part of the cognitive system not controlled by conscious awareness, which seems to correspond to what Epstein refers to as the experiential system. The challenge for further research is to somehow gain access into this experiential system to further examine how terror management processes evolve and operate. Such research would be worthwhile not only for illuminating the processes involved in terror management but also for enhancing our understanding of the general nature of psychological defenses and the dynamic unconscious.

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