

Personality and Social Psychology Bulletin

<http://psp.sagepub.com/>

Play It Safe or Go for the Gold? A Terror Management Perspective on Self-Enhancement and Self-Protective Motives in Risky Decision Making

Mark J. Landau and Jeff Greenberg
Pers Soc Psychol Bull 2006 32: 1633
DOI: 10.1177/0146167206292017

The online version of this article can be found at:
<http://psp.sagepub.com/content/32/12/1633>

Published by:



<http://www.sagepublications.com>

On behalf of:



[Society for Personality and Social Psychology](#)

Additional services and information for *Personality and Social Psychology Bulletin* can be found at:

Email Alerts: <http://psp.sagepub.com/cgi/alerts>

Subscriptions: <http://psp.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

Citations: <http://psp.sagepub.com/content/32/12/1633.refs.html>

>> [Version of Record](#) - Nov 22, 2006

[What is This?](#)

Play It Safe or Go for the Gold? A Terror Management Perspective on Self-Enhancement and Self-Protective Motives in Risky Decision Making

Mark J. Landau

Jeff Greenberg

University of Arizona

Terror management theory (TMT) posits that bolstering self-esteem buffers mortality concerns; accordingly, in past research, heightening mortality salience (MS) increases self-enhancement. However, risky self-esteem-relevant decisions often present a choice between enhancing self-esteem by striving for excellence and protecting self-esteem by avoiding potential failure. Which strategy is preferred under MS? Combining TMT with insights from Steele, Spencer, and Lynch's (1993) resource model, the authors hypothesized and found that MS leads high, but not low, self-esteem participants faced with a risky decision to pursue opportunities for excellence despite substantial risk of failure (Studies 1 and 2); in Study 3, using a more impactful decision, this effect was replicated and it was furthermore found that mortality-salient low-self-esteem participants become more risk-averse. Furthermore, in Study 2, a self-affirmation prime, previously shown to reduce MS-induced defenses, eliminated the self-enhancement effect among high-self-esteem participants. Implications for understanding self-esteem, TMT, and risky decision making are briefly discussed.

Keywords: *decision making; self-esteem; terror management theory; resource model; self-enhancement; self-protection*

An aspiring skateboarder, Chris has a modest but familiar repertoire of skateboarding maneuvers. One day his peers challenge Chris to perform a new and difficult trick. Chris knows that although successfully executing this trick will earn him acceptance and admiration, a botched attempt will result in ridicule. In such cases, as the ambitiousness of what one chooses to attempt to do increases, so does both the potential gain in self-esteem if one succeeds and the likelihood of a self-esteem-threatening failure. Consequently, when people can choose how difficult an endeavor to attempt, two strategies

can serve their self-esteem needs: they can strive to enhance success and opt for the high-payoff/high-risk alternative or they can choose to protect against the threatening implications of failure and prefer the low-payoff/low-risk alternative (e.g., Atkinson, 1957; Josephs, Larrick, Steele, & Nisbett, 1992; Loewenstein & Lerner, 2003; Lopes, 1987; for a review, see Larrick, 1993).

The broad goal of this article is to gain a more complete understanding of the factors that determine which strategy people will choose by considering the psychological function of self-esteem, a question addressed by terror management theory (TMT; see Greenberg, Solomon, & Pyszczynski, 1997; Solomon, Greenberg, & Pyszczynski, 1991). According to TMT, self-esteem functions in part to manage deeply entrenched concerns about mortality. Empirical support for this view is provided by evidence that self-esteem buffers anxiety and that reminders of one's mortality increase the use of self-enhancing strategies such as self-serving biases, group identifications, and increased striving for success in various achievement domains (see Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). However, TMT research has not yet considered the defensive function of self-protective strategies, such as Chris's option to stick to the familiar skateboarding tricks and avoid potential failure. The more specific goal of this article is thus to combine

Authors' Note: We thank Ryan Caskey and Allie Furman for their assistance in data collection. This work was partially supported by National Science Foundation Grant BCS-0241371. Correspondence concerning this article should be addressed to Mark J. Landau, University of Arizona, Department of Psychology, PO Box 210068, Tucson, AZ 85721-0068; e-mail: mjlandau@email.arizona.edu.

PSPB, Vol. 32 No. 12, December 2006 1633-1645

DOI: 10.1177/0146167206292017

© 2006 by the Society for Personality and Social Psychology, Inc.

insights from TMT with the resource model of self-threat resiliency (Steele, Spencer, & Lynch, 1993) to assess how heightened mortality concerns and trait self-esteem interact to influence which course of action people prefer when they are faced with risky self-esteem-relevant decisions.

TMT

TMT builds from Ernest Becker's (1971, 1973) broad theoretical analysis of the psychological function of perceiving meaning in the world and value and significance for the self. The theory posits that humans, by virtue of their capacities for abstract and temporal thought, realize that their death is always potentially imminent and ultimately inevitable. This realization conflicts with a biological orientation (shared with most other forms of life) to avoid threats to continued existence and in this way creates the potential to experience existential terror. People manage the potential for terror engendered by the awareness of their own mortality by (a) investing in cultural worldviews that imbue life with meaning, order, and permanence and offer the promise of death transcendence (either literal or symbolic) to those who fulfill cultural prescriptions for value and (b) maintaining the perception that they are fulfilling the cultural prescriptions for value and are thus eligible for some form of personal immortality. TMT defines self-esteem as the perception that one is a significant member of a meaningful universe that functions ultimately to provide protection from mortality concerns.

Two lines of evidence support the claim that self-esteem serves a terror management function. One comes from tests of the anxiety-buffer hypothesis: Insofar as self-esteem provides protection from the potential for anxiety, then increased levels of self-esteem should reduce proneness to anxiety. In an initial test of this hypothesis, Greenberg et al. (1992) found that boosting self-esteem with positive feedback on a personality test reduced self-reported anxiety in response to graphic video depictions of death. They also found that positive personality or intelligence feedback reduced physiological arousal in anticipation of painful electric shocks. Subsequent research demonstrated that participants with dispositionally high or temporarily elevated self-esteem did not exhibit defensive efforts to deny vulnerability to an early death (Greenberg et al., 1993) or the increased worldview defense and death-thought accessibility typically evoked by mortality reminders (Harmon-Jones et al., 1997).

A second line of support for the terror management function of self-esteem comes from tests of the mortality-salience hypothesis: Insofar as self-esteem provides protection from mortality concerns, then temporarily increasing the accessibility of death-related thought

(i.e., mortality salience, MS) should intensify efforts to bolster and defend self-esteem. Multiple studies using diverse operationalizations of self-esteem striving and defense have confirmed this broad hypothesis (for a review of this research, see Pyszczynski et al., 2004). For example, MS leads to increased efforts to fulfill standards of value and competence in various achievement domains, such as risky driving (Taubman Ben-Ari, Florian, & Mikulincer, 1999), fitness intentions (Arndt, Schimel, & Goldenberg, 2003), physical strength (Peters, Greenberg, & Williams, 2005), charitable action (Jonas, Schimel, Greenberg, & Pyszczynski, 2002), and identification with one's body (Goldenberg, McCoy, Pyszczynski, Greenberg, & Solomon, 2000), among those who value these domains as a source of self-esteem. MS also has been shown to increase other self-enhancing strategies, including adjustment of group identifications (Arndt, Greenberg, Schimel, Pyszczynski, & Solomon, 2002) and use of self-serving biases (Dechesne et al., 2003; Mikulincer & Florian, 2002). This research has operationalized MS in a variety of ways and has included a wide range of controls in which participants are induced to think about aversive topics other than death, such as physical pain, academic failure, or social rejection. Despite the fact that these control topics sometimes produce more negative affect than MS inductions, they have consistently failed to produce effects parallel to MS on the primary measures of self-enhancement.

In sum, convergent evidence supports the claim that self-esteem functions as a buffer against mortality concerns. However, in none of these studies did the opportunity to self-enhance carry a substantial risk of failure. For example, participants in the Mikulincer et al. studies had the opportunity to drive fast or not; likewise, participants in the Goldenberg et al. studies could identify with the body or not. These actions carried a single outcome with a relatively foreseeable and positive consequence for self-esteem; participants in these studies were not making decisions in which increased striving for self-esteem was accompanied by increased likelihood of failure. Consequently, we know very little about how terror management concerns influence self-esteem striving under conditions in which the more potential gain in self-esteem if one succeeds, the more the likelihood of self-esteem damaging failure. The present research explored this issue in contexts in which the individual can choose among actions varying in potential gain and potential risk to self-esteem.

Resource Model

Decisions are often influenced by the anticipated consequences of alternative outcomes on emotional well-being and self-esteem (Loewenstein & Lerner, 2003). According to the resource model (Steele et al., 1993),

the individual's estimation of how much a decision will affect his or her self-esteem is affected by his or her general level of self-esteem. This model builds on self-affirmation theory's (Steele, 1988; Steele & Liu, 1983) claim that people can flexibly defend global self-esteem from threats in one domain by affirming adequacy in unrelated domains. The model posits that an individual's trait self-esteem is positively associated with his or her general store of positive self-views, or affirmational resources, that can be recruited to cope with the threatening implications of a poor decision and thereby restore overall self-esteem. High self-esteem (SE) individuals tend to be less defensive in response to actual or potential self-threats because they possess more abundant and accessible holdings of affirmational resources; low SE individuals, in contrast, tend to have fewer and less accessible resources capable of affirming overall self-esteem and are thus more prone to defensiveness and risk-aversion (for a review of relevant research, see Spencer, Josephs, & Steele, 1993).

Josephs et al. (1992) applied the resource model to investigate the role of trait self-esteem in risky decision making. High and low SE participants decided between certain monetary gains and risky gambles; in addition, some participants were led to expect feedback about the results of foregone alternatives. Josephs et al. hypothesized that low SE participants who anticipated feedback on their decision would be motivated to avoid regret and would thus prefer the certain gain to the risky gamble, whereas high and low SE participants would exhibit comparable risk when no feedback was expected. The results were consistent with this hypothesis, supporting the notion that faced with a risky self-esteem-relevant decision, low SE individuals tend to choose the action that minimizes the potential for threat because they lack the affirmational resources to fend off postdecision regret; high SE individuals, in contrast, are less risk averse because they are confident in their ability to shrug off the regret of a poor choice. These results are more broadly consistent with the well-supported notion that high SE individuals are generally motivated to enhance their self-image and perceptions of success, whereas low SE individuals are more cautious in their responses to the social environment (Baumeister, Tice, & Hutton, 1989; Tice, 1993) and are motivated to protect their self-image from potential threats (e.g., by avoiding evaluative contexts that could potentially expose their personal shortcomings, Harris & Snyder, 1986; Strube & Roemmele, 1985, and self-handicapping when failure is meaningful, Tice, 1991).

Combining Insights

TMT research demonstrates that heightened mortality concerns increase self-esteem defense and striving, which has typically been operationalized as self-enhancing

tendencies to identify with or excel in valued domains in the relative absence of risk. However, people are often faced with two different strategies for maintaining a positive self-image: focus on attaining ideals or on avoiding the consequences of failing to attain them (James, 1890; McClelland, Atkinson, Clark, & Lowell, 1953). The resource model and similar approaches (e.g., Baumeister et al., 1989) posit that because of individual differences in affirmational resources, trait self-esteem is an important determinate of which strategy is used: high SE individuals strive to enhance success because they can recruit many resources to neutralize a potential failure, whereas low SE individuals minimize the potential for self-image threat to protect the few resources they have. Combining these insights, we expected that trait self-esteem would moderate how MS affects the decision between high-payoff/high-risk and low-payoff/low-risk alternatives. Specifically, in Study 1, we tested the hypotheses that mortality-salient high SE participants would be motivated to self-enhance and thus prefer the risky alternative, whereas mortality-salient low SE participants would choose the cautious alternative.

STUDY 1

Study 1 tests the hypothesis that MS would lead high SE participants to make more risky decisions in a self-esteem-relevant scenario but not in a self-esteem-irrelevant one. Low SE participants, in contrast, were not expected to show any increase in risk as a function of MS and should become even more risk-averse. To test these predictions, we primed high and low SE participants with either death or an aversive control topic and then had them make risky decisions on two scenarios. The format of the decision-making task was based on work by Kahnemann and Tversky (1979): Participants decide between a high-payoff/high-risk and a low-payoff/low-risk option at a series of trials and at each successive trial the probability that the high-payoff/high-risk outcome will result in success dwindles (with a corresponding increase in the likelihood of failure and social rejection). We were interested in when participants opted for the low-payoff/low-risk option—the sure thing. Based on the foregoing analysis, we predicted that MS would lead high SE participants, who possess sufficient resources to cope with the subjective impact of failure, to prefer the high-payoff/high-risk option even at low probabilities of success; in contrast, mortality-salient low SE participants would take a more risk-averse strategy, choosing the sure thing to minimize the possibility of failure.

Josephs et al. used forced-choice gambling scenarios in which the outcome of the risky gamble was decided on a random basis. Therefore, participants knew that the likelihood of the high-risk alternative resulting in a negative

outcome was randomly determined and not due to a personal shortcoming. Although a randomly determined negative outcome can call one's judgment into question, it seems that low SE participants were concerned with minimizing the potential for disappointment that one feels when random outcomes don't turn out in one's favor (e.g., losing the state lottery) rather than the threat to self-esteem when a negative outcome is perceived as the result of some personal shortcoming (see Loomes & Sugden, 1982). Because tasks that are highly relevant to one's self-image seem to show the clearest contrast between self-enhancement and self-protective motives (Pyszczynski & Greenberg, 1983; Tice, 1991), we wanted to assess risky decision making in cases where the decision's outcomes would clearly affect self-esteem. Specifically, we used a hypothetical scenario involving choosing which joke to tell from among jokes that vary in payoff and risk. Success or failure in joke-telling relates to social acceptance, wit, intelligence, and behavioral competence, domains that are acknowledged as widely valued (Allport, 1937; Harter, 1993; Higgins, 1996). We also had participants make similar ratings for a self-esteem-irrelevant scenario to assess whether the results could be due to an increase in generic risk-seeking.

Method

Participants were 114 introductory psychology undergraduates (90 women, 24 men) who participated as part of a class exercise. In a classroom setting, participants were asked to take part in a study of personality attributes and administered a randomly assigned packet of questionnaires. The packets differed only in the MS treatment and the order of the scenarios.

Following two personality fillers included to sustain the cover story, we included Rosenberg's (1965) trait self-esteem measure. The next page was an MS manipulation used in previous research (Dechesne et al., 2003). Participants in the MS condition responded to the following open-ended question: "Please write down the first sentence that comes to your mind when thinking about your own death." To control for the possibility that the effect of this induction is merely a generalized reaction to reminders of any aversive experience, participants in the control condition were asked, "Please write down the first sentence that comes to your mind when thinking about dental pain." Because MS effects have been found to be strongest after a short period of delay between an explicit MS induction and the dependent variable assessment (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994), all participants completed a self-report mood scale (PANAS; Watson, Clark, & Tellegen, 1988) and a neutral filler directly following the prime.¹

Participants were then given two risky decision-making scenarios (counterbalanced in order, see exact wording

in the appendix). The self-esteem-relevant scenario asked participants to imagine giving the commencement speech at their college graduation and having to choose between two jokes: Joke A (high payoff/high risk), which is hilarious and touching if successful but could fail completely, or Joke B (low payoff/low risk), which is less impressive but has a 100% likelihood of success. Participants were asked to decide between the jokes at 10 trials, where the likelihood of Joke A being successful decreases at each trial. For example, at Trial 1, Jokes A and B both have 100% likelihood of success: it thus makes sense to choose Joke A at this trial (which all participants did). At Trial 2, the likelihood of Joke A success is 90%, at Trial 3 it dwindles to 80%, and so forth. At Trial 10, there is a 0% chance that Joke A will be successful (as might be expected, all participants opted for Joke B at this trial). The self-esteem-irrelevant scenario followed the exact same format. However, the scenario asked participants to imagine another person at a convenience store deciding how to play a consumer contest. Because this decision was relatively trivial, revolved around someone else, and didn't bear on one's competence or general worth, it served as our self-esteem-irrelevant scenario. Following completion of the decision-making scenarios, participants were fully debriefed.

Results and Discussion

Preliminary analyses revealed no differences as a function of gender or the order in which the scenarios were presented. Thus, these variables were excluded from subsequent analyses. Our dependent measure was the trial, from 1 to 10, for which the participant first chose the low-payoff/low-risk option for the scenarios. Thus, the higher the score, the greater risk the individual was willing to take to tell the high potential payoff joke. To conduct a mixed ANOVA, we formed high and low SE groups via median split ($Mdn = 33.0$). A 2 (priming condition: MS vs. dental pain, between) \times 2 (high vs. low SE, between) \times 2 (scenario: self-esteem-relevant vs. irrelevant, within) mixed analysis of variance (ANOVA) revealed a main effect for scenario such that people were less risky in the self-esteem-relevant compared to the self-esteem-irrelevant scenario, $F(1, 110) = 7.90, p < .01$. Consistent with the resource model, there was also a Self-Esteem \times Scenario interaction, such that high SE participants were more risky than lows, but only in the self-esteem-relevant scenario, $F(1, 110) = 6.27, p = .01$. This was qualified by the predicted three-way interaction, $F(1, 110) = 5.01, p = .03$. To interpret this interaction, we performed separate Priming Condition (dummy coded) \times Self-Esteem (continuous and centered) regressions on the risk scores for each scenario.

Self-esteem-relevant scenario. This analysis revealed a main effect for self-esteem ($\beta = .23, t = 3.05, p = .003$) and a marginal priming condition main effect ($p = .11$),

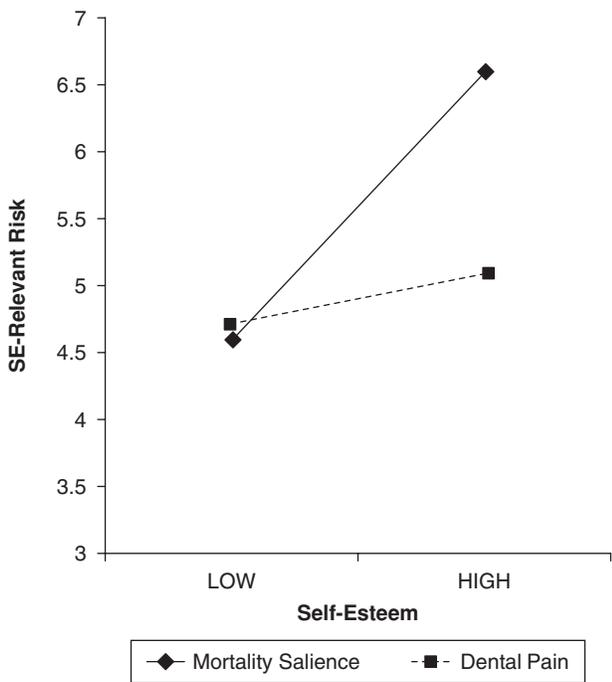


Figure 1 Self-esteem-relevant risk as a function of mortality salience and self-esteem in Study 1.

NOTE: SE = self-esteem. Higher scores indicate higher risk. Scale ranged from 1 to 10.

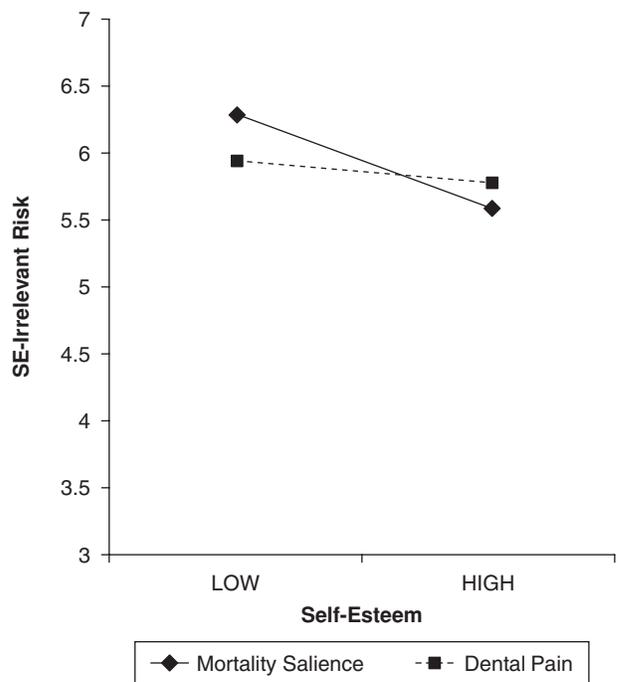


Figure 2 Self-esteem-irrelevant risk as a function of mortality salience and self-esteem in Study 1.

NOTE: SE = self-esteem. Higher scores indicate higher risk. Scale ranged from 1 to 10.

which were qualified by the two-way interaction ($\beta = -.24, t = -2.01, p = .05$). We plotted this interaction in Figure 1 using 1 *SD* above (high SE) and below (low SE) the mean of self-esteem (Aiken & West, 1991). Analyses of the simple slopes indicate that within the MS condition, high SE participants made more risky decisions than did lows ($\beta = .44, t = 3.64, p < .001$). Furthermore, among high SE participants, those in the MS condition were more risky than were those in the control prime condition ($\beta = .33, t = 2.58, p = .01$). The simple slope for self-esteem within the dental pain condition did not attain significance ($\beta = .08, t = .61, p = .54$).

Self-esteem-irrelevant scenario. The same analysis on the self-esteem-irrelevant scenario yielded no significant effects (all β s < .10, t s < 1.12, p s > .3; see plot in Figure 2).

These results supported the hypothesis that MS would lead high but not low SE participants to become more risky in a self-esteem-relevant decision. Furthermore, this effect did not extend to a self-esteem-irrelevant scenario, suggesting that defensive responses to MS are specific to ego-relevant decisions. This pattern of results is consistent with the claim that when facing an uncertain decision with divergent potential consequences for self-esteem, after MS, dispositional self-esteem is an important determinate of which route will be taken. Although we expected that low SE participants would respond to

MS with even less risk, the mean was very low, less than 5. This means that even when there was more than a 60% chance of succeeding with the risky joke, low SE participants opted for the safer joke. This may be why an MS-induced increase in self-esteem concern didn't push low SE participants to an even more conservative strategy.

STUDY 2

The results of Study 1 were generally consistent with the TMT/resource model prediction—when facing a risky self-esteem-relevant decision one can either opt for risky gains or play it safe, and heightening self-esteem concerns via MS led those with larger stores of self-esteem resources to become more risky, whereas those with fewer played it safe regardless of whether mortality was salient. Although prior research has found that MS increases low-risk self-esteem striving, the present results show that this is also true when increased self-esteem striving is associated with increased risk of failure, but only for individuals high in self-esteem.

TMT complements the resource model by lending insight into the psychological function of self-esteem. For the resource model and similar approaches, it is the potential for failure and regret that decision makers defend against. According to TMT, however, striving to

enhance self-esteem, such as with positive illusions or striving in valued domains, is itself a defensive response to deep-seated mortality concerns. Therefore, combining the two perspectives yields an interesting prediction about how risky decision making would be affected when a self-affirmation induction (e.g., Fein & Spencer, 1997; Sherman, Nelson, & Steele, 2000; Steele, 1988; Steele & Liu, 1983; Tesser & Cornell, 1991) renders affirmational resources more available: insofar as self-enhancement is a defensive response to mortality reminders, an opportunity to affirm valued characteristics should eliminate high SE participants' mortality-induced striving for success. This prediction is consistent with a number of findings that bolstering self-esteem (e.g., through positive feedback on personality and intelligence tests) or affirming a valued self-aspect eliminates the increased accessibility of death-related thoughts and worldview defense typically instigated by MS inductions (Harmon-Jones et al., 1997; Schmeichel & Martens, 2005; for a review, see Pyszczynski et al., 2004). This prediction is tested in Study 2.

To test this hypothesis, we used a design similar to Study 1, but in addition we had half the participants complete a self-affirmation prime designed to focus their thoughts on an important personal value and thereby activate affirmational resources. If our analysis is correct, for high SE individuals, this self-affirmation should reduce the MS-induced preference for a high-gain/high-risk choice. It is also possible that after MS, the self-affirmation induction will provide sufficient resources to increase risk-taking among low SE participants. However, it is unclear whether low SE individuals have sufficient resources to draw on for self-affirmation given that the evidence on the effects of self-affirmation on low SE individuals is mixed (e.g., Murray, Bellavia, & Feeney, 2001; Spencer, Fein, & Lomore, 2001).

Method

Participants were 75 undergraduates (40 women, 35 men) who participated for extra credit. In Study 1, we measured dispositional self-esteem during the experimental session. However, there is evidence that simply completing a self-esteem measure can render affirmational resources more salient (Steele et al., 1993). Because in Study 2 we looked specifically at self-affirmation, we wanted to avoid the potential for affirmation in the experimental session via the self-esteem assessment. Therefore, for the current study, we measured participants' self-esteem (using Rosenberg's measure) approximately 8 weeks prior to the experimental session in a mass screening session.

In a lab setting, a male experimenter (blind to condition) explained that the study was concerned with personality characteristics and ushered participants into separate cubicles. They were then administered a packet

of materials and encouraged to respond naturally and to work through the materials in the order presented.

Following a couple of fillers intended to sustain the cover story, participants were given a self-affirmation prime intended to prime a personally important or unimportant value or attribute (see Cohen, Aronson, & Steele, 2000; Sherman et al., 2000). The first page listed 12 values and attributes and participants were instructed to rank them in order of personal importance. The list included the following values and characteristics: aesthetic appreciation, sense of humor, relations with family and friends, spontaneity, social skills, athletics, music ability or appreciation, neatness or tidiness, physical attractiveness, creativity, managerial skills, and romantic values. Participants in the affirmation condition were instructed to consider their most important value/characteristic from the ranking exercise and to write a brief essay explaining why the value is important to them and describing a time in their lives when it had been particularly important. Participants in the no affirmation condition were instructed to consider their ninth-ranked value and write a brief essay describing why the value might be important to the average student.

The next questionnaire was the MS manipulation. Participants in the MS condition responded to two open-ended questions (used in prior TMT studies, e.g., Greenberg et al., 1990): "Please briefly describe the thoughts and 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 as you physically die and once you are physically dead."

McGregor, Zanna, Holmes, and Spencer (2001) and van den Bos (2001) have recently suggested an alternative explanation of MS effects according to which MS may be a special case of the general impact of uncertainty. Although a large body of evidence suggests that MS effects are generally not the result of uncertainty concerns and are specific to death (Greenberg et al., 1997; Landau et al., 2004; Mikulincer, Florian, & Hirschberger, 2003), it was important to test this alternative in the current study given the rather straightforward link between risky decision making and uncertainty concerns. To test whether the predicted effects are specific to thoughts of death and not generalized uncertainty, we gave participants in the control condition van den Bos's (2001) uncertainty salience induction: "Please briefly describe the emotions that the thought of your being uncertain arouse in you" and "Please write down, as specifically as you can, what you think physically will happen to you as you feel uncertain." The PANAS and a neutral filler served as the delay and distraction following the MS manipulation.

The final page in the packet was the self-esteem-relevant decision scenario used in Study 1. Because the

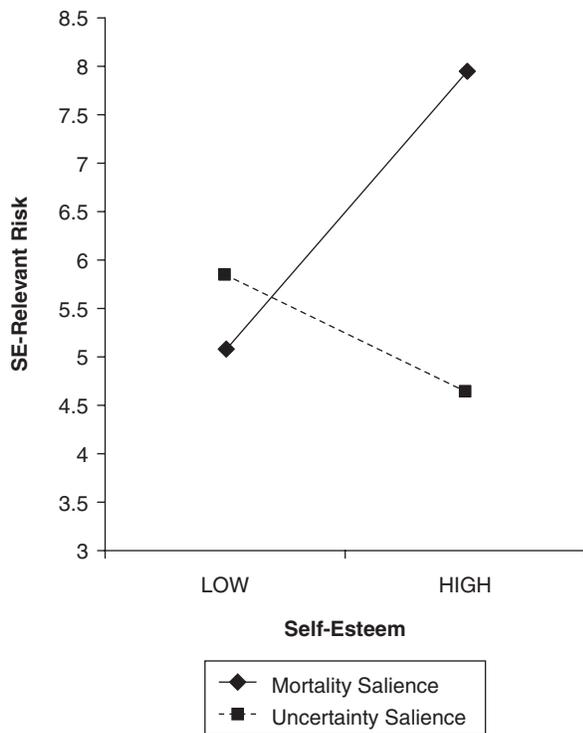


Figure 3 Self-esteem-relevant risk as a function of mortality salience and self-esteem with no affirmation in Study 2.

NOTE: SE = self-esteem. Higher scores indicate higher risk. Scale ranged from 1 to 10.

results of Study 1 revealed no effects for the self-esteem-irrelevant decision scenario, we did not include it in the current study. After completing this questionnaire, participants were debriefed.

Results and Discussion

Preliminary analyses revealed no differences as a function of gender. We regressed self-esteem-relevant risk on priming condition (MS vs. uncertainty salience, dummy coded), self-esteem (continuous and centered), self-affirmation (affirmation vs. no affirmation, dummy coded), and all interactions. Results revealed a marginal main effect for affirmation ($\beta = .21, t = 1.81, p = .07$), which was qualified by the predicted three-way interaction ($\beta = .69, t = 2.70, p < .01$; all other t s $< 1.5, p$ s $> .14$). To interpret this, we examined the Priming Condition \times Self-Esteem interaction separately within the affirmation and no affirmation conditions.

No affirmation condition. Within the no affirmation condition, we found the predicted two-way interaction ($\beta = .62, t = 2.45, p = .02$). We plotted this interaction in Figure 3 using 1 *SD* above (high SE) and below (low SE) the mean of self-esteem. As predicted, and replicating the results of Study 1, analysis of the simple slopes

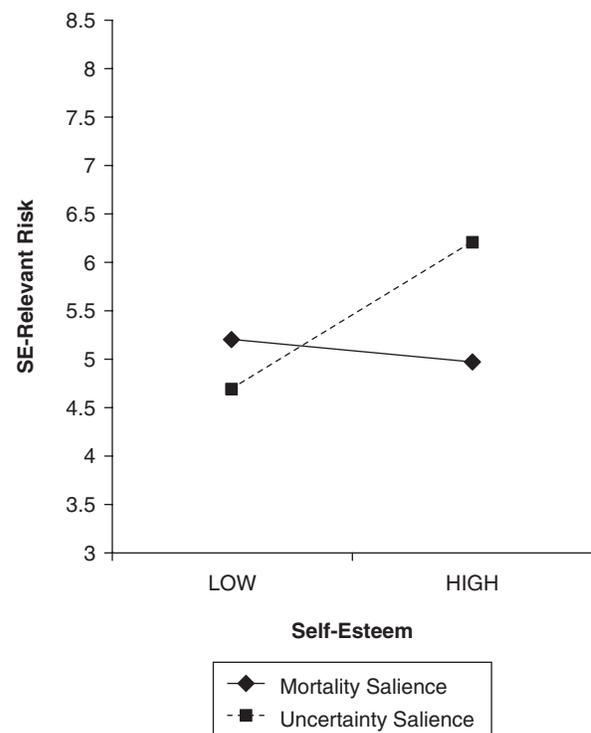


Figure 4 Self-esteem-relevant risk as a function of mortality salience and self-esteem with affirmation in Study 2.

NOTE: SE = self-esteem. Higher scores indicate higher risk. Scale ranged from 1 to 10.

indicate that within the MS condition, high SE participants made more risky decisions than did lows ($\beta = .59, t = 2.36, p = .02$). Furthermore, among high SE participants, those in the MS condition were more risky than those in the uncertainty salience condition ($\beta = .65, t = 2.55, p = .02$). Also, among mortality-salient high SE participants, those in the no affirmation condition exhibited significantly more risk than did those in the affirmation condition ($\beta = .63, t = 3.38, p = .002$). The slope for self-esteem within the uncertainty salience condition was negative but did not attain significance ($\beta = -.24, t = 1, p = .30$).

Affirmation condition. The same analysis conducted within the affirmation condition revealed no significant main effects for priming condition or self-esteem, and their interaction also was nonsignificant (t s $< 1.1, p$ s $> .2$; see Figure 4 for slopes). The trend for uncertainty-salient high SE participants to become more risky did not meet significance ($t = 1.25, p > .2$).

Study 2 replicated the effect found in Study 1—high SE participants responded to MS with increased risk—but also showed that this effect was eliminated when high SE participants completed a self-affirmation prime prior to the MS manipulation. These results support the notion that striving to enhance success in a risky

decision is itself a psychological defense against mortality concerns. When self-esteem is bolstered by self-affirmation, high SE participants no longer exhibit a defensive increase in risk. As in Study 1, low SE participants maintained a relatively low level of risk, and this was not reliably influenced by MS, self-affirmation, or their interaction; however, the direction of the means for the low SE individuals was generally consistent with reduced risk-taking after MS.

STUDY 3

Although convergence of the findings from the first two studies using two different MS inductions and two different aversive control conditions increases confidence in our analysis, these studies used the same hypothetical decision scenario. Consequently, it is important to test our hypotheses with a different decision and one involving a real choice rather than a hypothetical one. Thus, in Study 3, we had participants choose the level of potential payoff and risk in an assessment of their creativity.

We also thought that MS would be more likely to motivate decreased willingness to risk failure among low SE individuals if the decision—and potential for failure—were real rather than hypothetical. Thus, we expected that in a more ego-involving context, MS would not only increase risk-taking among high SE participants (as in Studies 1 and 2) but also would reduce risk-taking among low SE participants. Finally, we contrasted MS with a new control condition that by asking participants to think about unpredictable bouts of intense physical pain simultaneously makes high aversiveness and high uncertainty salient. No control condition employed in prior MS studies has so explicitly made both of these concepts salient at once.

Method

The sample consisted of 48 undergraduates (34 women, 14 men) who took part in the experiment in partial fulfillment of a course requirement. Of these, 2 participants in the control prime condition were dropped from the data analyses because their responses to the open-ended questions about uncertain pain included explicit references to their own death, leaving a total of 46 participants. Participants were run in small groups in a laboratory setting by a female experimenter. The study was described as concerning the link between personality characteristics and creativity. Participants were told that after completing some personality forms they would complete a test of their creative intelligence. To heighten the self-esteem relevance of the creativity test, the experimenter emphasized that creative intelligence is linked to general intelligence and is an important predictor of academic and career success.

She also told participants that they would receive feedback on their creativity test performance to get an idea of their creative strengths and weaknesses (in actuality, no feedback was given).

In separate cubicles, participants were administered a randomly assigned packet of personality-gauging questionnaires. As in Study 1, Rosenberg's self-esteem measure followed two neutral fillers. The next page was the MS manipulation. Participants in the MS condition completed the same open-ended questions pertaining to one's eventual death that were used in Study 2. Participants in the control condition completed parallel questions with respect to the experience of uncertain bouts of severe physical pain:

Imagine experiencing bouts of intense physical pain; you are uncertain how long they will last, when they will occur, and how they will affect your activities. Please briefly describe the emotions that the thought of experiencing such bouts of pain arouses in you. . . . Jot down, as specifically as you can, what you think will happen to you as you experience these bouts of pain and once you have experienced them.

All participants then completed the PANAS and a neutral filler as the necessary delay.

The experimenter then returned to the cubicle to administer a folder of materials and the instructions for the creative intelligence test, which involved coloring in an abstract geometric line pattern with seven spaces. The format of the patterns was similar to that of paint by numbers exercises. Specifically, inside some of the spaces were numbers that determined how that space was supposed to be colored. The instructions emphasized that spaces with numbers in them must be filled in completely with the color corresponding to that number. The instructions then explained that the patterns have varying numbers of open spaces that contained no numbers and were intended to provide the opportunity for the participant to be as creative as he or she wants. Specifically, the instructions said,

In other words, you are free to design these spaces in whatever way you want, with whatever colors and patterns you think reflect *your true creativity*. Within these spaces, you can make new shapes or patterns, use multiple colors, and include pictures and text.

We expected that participants would perceive the choice of a pattern with many open spaces as a riskier choice than one with few open spaces because such a pattern provides a much larger area to display either one's creative capacities or lack thereof; thus, many open spaces provides both the opportunity to excel in creative intelligence and to fail abysmally. Alternatively, choosing a

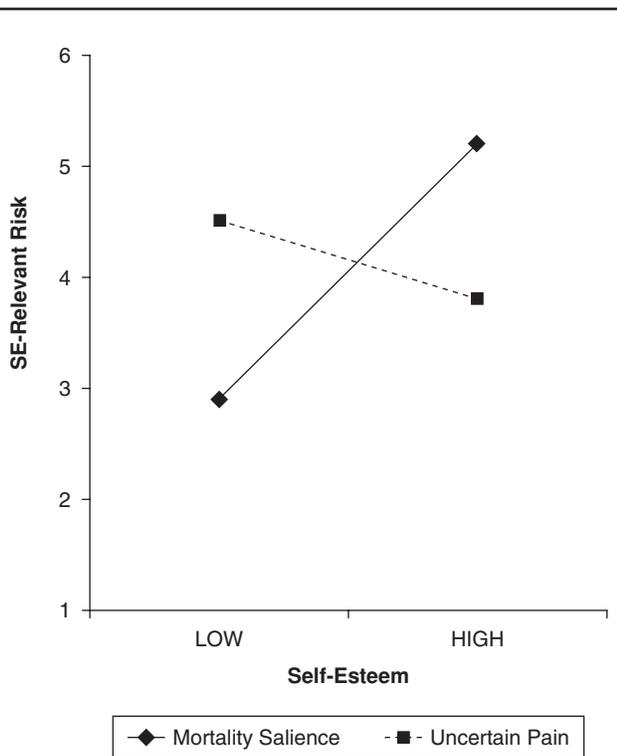


Figure 5 Self-esteem-relevant risk as a function of mortality salience and self-esteem in Study 3.

NOTE: SE = self-esteem. Higher scores indicate higher risk. Scale ranged from 1 to 6.

pattern with few open spaces and most of the spaces to be completed in a predetermined manner is less risky, with less opportunity either to excel or fail. It is important to note, however, that whereas in Studies 1 and 2 the decision between the two jokes was explicitly defined as a risky decision, and the probabilities of success and failure were clearly specified, in the current study we cannot be sure that participants perceived the choice between patterns as varying in risk in the expected manner.

Therefore, we conducted a pilot investigation to assess this assumption. We had 18 participants (5 men, 13 women) from the same subject pool as in Study 3 imagine that they were participating in a test of their creative intelligence and complete a packet of materials. The packet began with the same instructions used in the main study; the next two pages were two versions of the same pattern, one with 1 open space and one with 6 open spaces (we randomly selected one of the two one vs. six open-space patterns used in the main study; the two versions were counterbalanced in order). The final page contained a single forced-choice question:

Imagine that you are taking this test of creative intelligence and that you were going to be given a choice which test form (A or B) you wanted to

complete and receive feedback on. Please circle which test form you think provides both the greatest opportunity to show a high level of creativity and the greatest risk of showing a low level of creativity [followed by *Test form "A"* and *Test form "B"*].

The results indicate that 94% of the participants (all but one) chose the pattern with more open spaces as the riskier pattern, $\chi^2(1) = 14.2$, $p < .01$. This finding supports the assumption that participants spontaneously perceive a pattern with more open spaces as a riskier choice than one with fewer open spaces.

In the main study, participants were given a folder containing six different patterns (presented in random order) and were instructed to select the pattern that they wanted to complete and receive feedback on. Each pattern had seven spaces and between one to six open spaces. To prevent confounding the number of open spaces with a particular pattern, participants received one of two pattern sets such that for a given pattern, the number of open spaces in one set was the reverse score (on a 6-point scale) of the number of open spaces in the other set. Preliminary analyses including pattern set as a between-subjects factor revealed no significant main effects or interactions; therefore, this variable was excluded from subsequent analyses. After participants had chosen their pattern, the experimenter explained that they would not be completing the pattern. A full debriefing followed.

Results and Discussion

The dependent measure was the chosen pattern corresponding to the number of risky open spaces (1-6) participants chose to complete. We regressed the open-space number on priming condition (MS vs. uncertain pain, dummy coded), self-esteem (continuous and centered), gender, and all interactions. Results revealed no significant main effects but the predicted Priming Condition \times Self-Esteem interaction ($\beta = .77$), $t(39) = 3.64$, $p = .001$.² We plotted this interaction in Figure 5 using 1 *SD* above (high SE) and below (low SE) the mean of self-esteem. As predicted, and conceptually replicating the results of Studies 1 and 2, analyses of the simple slopes indicate that within the MS condition, high SE participants made more risky decisions than did lows ($\beta = .89$, $t = 2.72$, $p = .01$). Also replicating the results of Studies 1 and 2, high SE participants chose to complete significantly more risky open spaces in the MS condition compared with those in the uncertain pain condition ($\beta = .58$, $t = 2.10$, $p = .03$). Furthermore, as hypothesized, low SE participants chose to complete significantly fewer risky open spaces in the MS condition compared with those in the uncertain pain condition ($\beta = .66$, $t = 2.29$, $p = .03$). The slope for self-esteem within the uncertain pain condition was negative but did not attain significance ($\beta = -.25$, $t = -1.11$, $p = .27$).

Using a real decision rather than a hypothetical one, and making aversive and uncertain thoughts salient in the control condition, Study 3 provided a conceptual replication of the effects found in Studies 1 and 2: High SE participants responded to MS with increased risk, choosing a pattern that offered greater possibilities of showing one's creativity or lack thereof. Furthermore, this study also showed that low SE individuals primed with mortality became more risk-averse than control-primed low SE individuals, choosing a pattern that offered little opportunity to assess their creativity level. Participants primed with intense and unpredictable bouts of pain, a highly aversive and highly uncertain future prospect, did not exhibit these effects. Taken together with the finding in Study 2 that uncertainty salience did not produce effects parallel to MS, these findings make an especially strong case for the specific role of mortality concerns in activating self-enhancement and self-protective motives in risky decision making.

GENERAL DISCUSSION

The present studies examined the effects of MS on activation of self-esteem enhancement and protection motives in the context of risky self-esteem-relevant decisions. Prior research (Spencer et al., 1993) has shown that trait self-esteem is a useful determinate of choice among enhancing and protective strategies: high SE individuals, who possess more affirmational resources capable of coping with regret, are motivated to enhance self-esteem; low SE individuals have fewer affirmational resources and are thus motivated to protect their self-esteem from the threatening implications of failure.

Based on this work, Study 1 tested the prediction that self-esteem needs instigated by MS would lead high, but not low, SE participants to self-enhance by choosing the high-payoff/high-risk alternative in a self-esteem-relevant (but not irrelevant) scenario. This prediction was confirmed. This finding extends TMT research, which has tended to focus on safe self-enhancing strategies, by showing that MS leads high but not low SE individuals to make choices involving both more potential self-esteem gain and more risk of failure. In Study 2, high SE participants again responded to MS (using a different induction) with increased self-enhancement, but this effect was eliminated when participants completed a self-affirmation prime intended to boost perceived resources. This finding extends the resource model by suggesting that self-enhancing risk (and not only protective risk-aversion) can serve as a defensive strategy when mortality concerns are high. Finally, in Study 3, using a real decision, we replicated the mortality-induced risky self-enhancement effect for high SE individuals, and more

important, we also found that MS led low self-esteem individuals to make a more self-protective, low-risk choice. This latter finding supports the idea that when self-esteem resources are low, in risky situations, shielding the self from the potential for failure can serve as a defensive strategy against mortality concerns. The results of Study 3 provide the first evidence that MS can increase efforts to protect self-esteem by avoiding the potential for failure.

Given that trait self-esteem is an individual difference measure, we cannot be certain about what aspect or correlate of self-esteem is responsible for its moderating influence on MS effects. However, we believe that the integration of TMT and the resource model that was the basis of our hypotheses provides the most likely account. High SE people, with many self-esteem resources available, opt ambitiously to go for the gold when mortality is made salient, knowing that their self-worth can withstand the potential threat of failure. Low SE people reminded of their mortality but with highly limited self-esteem resources don't want to risk failure, which could further sap their limited feelings of self-worth.

The most likely alternative explanation of the moderating role of self-esteem may be based on the different expectations for success of high and low SE people. Being generally higher in self-efficacy, high SE people were likely to have been more confident that they could pull off the high-payoff joke and demonstrate their creativity. Thus, they may have been more willing to choose the high-risk option after MS because they were more confident of winning the gold. However, this explanation seems a bit less likely because the task in Studies 1 and 2 explicitly specified the probabilities of success of the various options. In addition, the effects of self-affirmation in Study 2 would be hard to account for with a self-efficacy explanation. If anything, self-affirmation should increase perceived self-efficacy, in which case it should have increased risky decision making among high SE participants, yet it did the opposite, in line with our integration of TMT with the resource model. Still, further research is needed to definitively determine what mediates the moderating role of self-esteem on the effects of MS on choice of self-enhancing or self-protective strategies. We chose self-esteem to focus on as the individual difference measure in the current studies because it is the pivotal construct in our integration of TMT with the resource model and central to research on both topics.

Implications for TMT, Self-Esteem, and Decision Theories

In addition to showing MS-induced risky self-enhancement among high SE individuals, an important contribution of the current research is the finding from Study 3 that low SE participants responded to MS with safer, self-protective choices in a real self-esteem-relevant

decision. This finding extends TMT because existing empirical support for the terror management function of self-esteem consists primarily of demonstrations that MS bolsters efforts to enhance the self or succeed in valued performance domains in the relative absence of risk (Pyszczynski et al., 2004). The current findings show, however, that MS not only leads to increased efforts to excel but also leads those with low dispositional self-esteem to avoid the potential for failure and regret. The important implication, then, is that mortality-induced concerns with personal competence and worth may not always manifest in heightened striving for excellence; they also can motivate some people—at least those who are low in self-esteem resources and vulnerable to threats to their self-image—to limit their aspirations to avoid the threatening implications of failure.

The current findings are consistent with motivational theories of risk preferences (e.g., Atkinson, 1957; Lopes, 1987), which posit that decisions are based in part on anticipated emotional consequences of a decision and that some people will be chronically motivated to maximize positive emotional outcomes, whereas others will be motivated to minimize the possibility of negative emotional outcomes. The current findings go further, however, in suggesting that tendencies toward risk-aversion and risk-proneness both stem in part from a single, more distal psychological motivation to maintain self-esteem as a buffer against mortality concerns. The resource model contributes the insight that individuals with low self-esteem have fewer means of defending against a threat to their self-image and are therefore more likely to be cautious in their ego-relevant decisions when terror management needs are heightened. Of interest, the current findings also suggest that self-affirmations and other ways to bolster terror management may sometimes reduce the motivation of high SE people to reach toward their most ambitious aspirations.

An interesting issue for future research concerns the potential role of self-esteem stability (Kernis & Goldman, 2003) in such risky decision making. Unstable high SE people seem to simultaneously want high self-esteem and yet lack the resources to sustain it. Thus, they may be motivated to go for the gold after MS, or they may choose to play it safe. Perhaps such individuals would generally play it safe but, unlike our low self-esteem participants, would be buttressed sufficiently by a self-affirmation experience to choose the option with more potential for self-esteem gain.

These findings also suggest a parallel with work based on regulatory focus theory (Higgins & Spiegel, 2004). In the current studies, for high SE individuals, MS seemed to encourage a promotion focus, that is, a focus on maximizing the possible gain, whereas for low SE individuals, MS appeared to encourage a prevention focus,

that is, minimizing the chance of loss. This suggests that adjustments in regulatory focus may play a significant role in the particular modes of terror management people choose, a matter that may warrant additional attention in future research.

In these studies, we focused on risky decision making to examine self-enhancement and self-protective motives in terror management processes. However, other lines of research show that low SE individuals use diverse strategies, such as self-handicapping (Tice, 1991), public displays of modesty (Baumeister et al., 1989), and failing strategically (Baumeister et al., 1989), to protect their self-image from the threatening implications of failure. A useful direction for future research would be to examine whether the use of these strategies is affected by MS and dispositional and situationally manipulated self-esteem. More research along these lines might yield useful insights into why people are sometimes rigidly compelled to succeed at any cost, whereas at other times, they fall short of achieving their full individual potential.

APPENDIX

Self-Esteem-Relevant and Self-Esteem-Irrelevant Decision Scenarios

Self-Esteem-Relevant Scenario

Imagine that you have been asked to give a speech at your graduation ceremony. You are speaking to hundreds of your classmates. Now imagine that you can begin your speech with one of two jokes: Joke A OR Joke B. If you tell Joke A, it can turn out to be *extremely funny and touching*. However, Joke A is a little complicated, and there's a chance that no one will laugh. Joke B is mildly funny, but *not as funny* as Joke A. However, Joke B is guaranteed to work—everyone will get it. The circles in the tables below represent your chances of successfully delivering each joke. If each box contains a circle, your chances of successfully delivering the joke are guaranteed, whereas if there are no circles, you have no chance of successfully delivering the joke. Imagine that for each numbered pair below, you must choose to deliver only Joke A OR Joke B. Note that you are offered varying chances of Joke A being successful, while your chances of Joke B being successful are always guaranteed. For each row, indicate which joke you would choose to tell by placing a checkmark in *one* of the two boxes.

Self-Esteem-Irrelevant Scenario

Imagine that Don goes to a convenience store to pick up a 24-pack of soda. As it happens, the store is holding a contest. Don is told that he can choose one of two options: Option A OR Option B. If Don chooses Option A he will get to spin a wheel. If the wheel lands on the right spot, Don will get the soda completely free. However, if the wheel does not stop on the right place, Don will have to pay full price for the soda. If he chooses Option B, he will receive a dollar off his 24-pack

with no questions asked. The circles in the tables below represent Don's chances of success at Option A or Option B. If each box contains a circle, his chances of receiving the option are guaranteed, whereas if there are no circles, he has no chance of success with the option. Imagine that for each numbered pair below, you must choose whether Don should choose Option A OR Option B. Note that Don is offered varying chances of Option A being successful, while his chances of Option B are always guaranteed. For each row, indicate which option you think Don should choose by placing a checkmark in *one* of the two boxes.

NOTES

1. To assess whether mortality salience (MS) affected mood, we performed a MANOVA and ANOVAs on the subscales of the PANAS and ANOVAs on the aggregate positive and negative affect scales as well. Consistent with previous TMT research demonstrating that MS does not engender affect, there were no significant differences found for these analyses. To ensure that the MS effects reported above were not mediated by affect, we conducted ANCOVAs with the affect subscale scores (including positive and negative affect) as covariates and the effects of MS remained statistically intact. Thus, we are quite confident that, as in past research, these findings are not caused by affective differences between MS and control conditions.

2. The analysis also revealed an unexpected Gender \times Self-Esteem interaction ($\beta = .60$, $t(39) = 2.43$, $p = .02$). Inspection of means does not suggest any clear interpretation, and because the interaction did not involve MS, we did not consider it further (all other t s < 1.6 , p s $> .16$).

REFERENCES

- Aiken, L. S., & West, S. G. (1991). *Multiple regressions: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Allport, G. W. (1937). *Personality: A psychological interpretation*. New York: Holt, Rinehart & Winston.
- Arndt, J., Greenberg, J., Schimel, J., Pyszczynski, T., & Solomon, S. (2002). To belong or not to belong, that is the question: Terror management and identification with gender and ethnicity. *Journal of Personality and Social Psychology*, *83*, 26-43.
- Arndt, J., Schimel, J., & Goldenberg, J. L. (2003). Death can be good for your health: Fitness intentions as a proximal and distal defense against mortality salience. *Journal of Applied Social Psychology*, *33*, 1726-1746.
- Atkinson, J. W. (1957). Motivational determinants of risk-taking behavior. *Psychological Review*, *64*, 359-372.
- Baumeister, R. F., Tice, D. M., & Hutton, D. G. (1989). Self presentations motivations and personality differences in self-esteem. *Journal of Personality*, *57*, 547-579.
- Becker, E. (1971). *The birth and death of meaning*. New York: Free Press.
- Becker, E. (1973). *The denial of death*. New York: Free Press.
- Cohen, G. L., Aronson, J., & Steele, C. M. (2000). When beliefs yield to evidence: Reducing biased evaluation by affirming the self. *Personality and Social Psychology Bulletin*, *26*, 1151-1164.
- Dechesne, M., Pyszczynski, T., Arndt, J., Ransom, S., Sheldon, K. M., van Knippenberg, et al. (2003). Literal and symbolic immortality: The effect of evidence of literal immortality on self-esteem striving in response to mortality salience. *Journal of Personality and Social Psychology*, *84*, 722-737.
- Fein, S., & Spencer, S. J. (1997). Prejudice as self-image maintenance: Affirming the self through derogating others. *Journal of Personality and Social Psychology*, *73*, 31-44.
- Goldenberg, J. L., McCoy, S. K., Pyszczynski, T., Greenberg, J., & Solomon, S. (2000). The body as a source of self-esteem: The effects of mortality salience on identification with one's body, interest in sex, and appearance monitoring. *Journal of Personality and Social Psychology*, *79*, 118-130.
- Greenberg, J., Pyszczynski, T., Solomon, S., Pinel, E., Simon, L., & Jordan, K. (1993). Effects of self-esteem on vulnerability-denying defensive distortions: Further evidence of an anxiety-buffering function of self-esteem. *Journal of Experimental Social Psychology*, *29*, 229-251.
- Greenberg, J., Pyszczynski, T., Solomon, S., Rosenblatt, A., Veeder, M., Kirkland, S., et al. (1990). Evidence for terror management II: The effects of mortality salience on reactions to those who threaten or bolster the cultural worldview. *Journal of Personality and Social Psychology*, *58*, 308-318.
- Greenberg, J., Pyszczynski, T., Solomon, S., Simon, L., & Breus, M. (1994). Role of consciousness and accessibility of death-related thoughts in mortality salience effects. *Journal of Personality and Social Psychology*, *67*, 627-637.
- Greenberg, J., Solomon, S., & Pyszczynski, T. (1997). Terror management theory of self-esteem and social behavior: Empirical assessments and conceptual refinements. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 29, pp. 61-139). New York: Academic Press.
- Greenberg, J., Solomon, S., Pyszczynski, T., Rosenblatt, A., Burling, J., Lyon, D., et al. (1992). Assessing the terror management analysis of self-esteem: Converging evidence of an anxiety-buffering function. *Journal of Personality and Social Psychology*, *63*, 913-922.
- Harmon-Jones, E., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., & McGregor, H. (1997). Terror management theory and self-esteem: Evidence that increased self-esteem reduces mortality salience effects. *Journal of Personality and Social Psychology*, *72*, 24-36.
- Harris, R. N., & Snyder, C. R. (1986). The role of uncertain self-esteem in self-handicapping. *Journal of Personality and Social Psychology*, *51*, 451-458.
- Harter, S. (1993). Causes and consequences of low self-esteem in children and adolescents. In R. F. Baumeister (Ed.), *Self-esteem: The puzzle of low self-regard* (pp. 87-116). New York: Plenum.
- Higgins, E. T. (1996). The "self digest": Self-knowledge serving self-regulatory functions. *Journal of Personality and Social Psychology*, *71*, 1062-1083.
- Higgins, E. T., & Spiegel, S. (2004). Promotion and prevention strategies for self-regulation: A motivated cognition perspective. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 171-187). New York: Guilford.
- James, W. (1890). *The principles of psychology*. New York: Dover.
- Jonas, E., Schimel, J., Greenberg, J., & Pyszczynski, T. (2002). The Scrooge effect: Evidence that mortality salience increases prosocial attitudes and behavior. *Personality and Social Psychology Bulletin*, *28*, 1342-1353.
- Josephs, R. A., Larrick, R. P., Steele, C. M., & Nisbett, R. E. (1992). Protecting the self from the negative consequences of risky decisions. *Journal of Personality and Social Psychology*, *62*, 26-37.
- Kahnemann, D., & Tversky, A. (1979). Prospect theory: An analysis of choice under risk. *Econometrica*, *47*, 263-291.
- Kernis, M. H., & Goldman, B. M. (2003). Stability and variability in self-concept and self-esteem. In M. R. Leary & J. P. Tangney (Eds.), *Handbook of self and identity* (pp. 106-127). New York: Guilford.
- Landau, M. J., Johns, M., Greenberg, J., Pyszczynski, T., Martens, A., Goldenberg, J. L., et al. (2004). A function of form: Terror management and structuring the social world. *Journal of Personality and Social Psychology*, *87*, 190-210.
- Larrick, R. P. (1993). Motivational factors in decision theories: The role of self-protection. *Psychological Review*, *113*, 440-450.
- Loewenstein, G., & Lerner, J. S. (2003). The role of affect in decision making. In R. J. Davidson, K. R. Scherer, & H. H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 619-642). New York: Oxford University Press.
- Loomes, G., & Sugden, R. (1982). Regret theory: An alternative theory of rational choice under uncertainty. *Economic Journal*, *92*, 805-824.
- Lopes, L. L. (1987). Between hope and fear: The psychology of risk. *Advances in Experimental Social Psychology*, *20*, 255-295.
- McClelland, D. C., Atkinson, J. W., Clark, R. W., & Lowell, E. L. (1953). *The achievement motive*. New York: Appleton-Century-Croft.
- McGregor, I., Zanna, M. P., Holmes, J. G., & Spencer, S. J. (2001). Compensatory conviction in the face of personal uncertainty: Going to extremes and being oneself. *Journal of Personality and Social Psychology*, *80*, 472-488.

- Mikulincer, M., & Florian, V. (2002). The effect of mortality salience on self-serving attributions: Evidence for the function of self-esteem as a terror management mechanism. *Basic and Applied Social Psychology, 24*, 261-271.
- Mikulincer, M., Florian, V., & Hirschberger, G. (2003). The existential function of close relationships: Introducing death into the science of love. *Personality and Social Psychology Review, 7*, 20-40.
- Murray, S. L., Bellavia, G., & Feeney, B. (2001). The contingencies of interpersonal acceptance: When romantic relationships function as a self-affirmational resource. *Motivation and Emotion, 25*, 163-189.
- Peters, H. J., Greenberg, J., & Williams, J. M. (2005). Applying terror management theory to performance: Can reminding individuals of their mortality increase strength output? *Journal of Sport and Exercise Psychology, 27*, 111-116.
- Pyszczynski, T., & Greenberg, J. (1983). Determinants of reduction in intended effort as a strategy for coping with anticipated failure. *Journal of Research in Personality, 17*, 412-422.
- Pyszczynski, T., Greenberg, J., Solomon, S., Arndt, J., & Schimel, J. (2004). Why do people need self-esteem? A theoretical and empirical review. *Psychological Bulletin, 130*, 435-468.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Schmeichel, B. J., & Martens, A. (2005). Self-affirmation and mortality salience: Affirming values reduces worldview defense and death-thought accessibility. *Personality and Social Psychology Bulletin, 31*, 658-667.
- Sherman, D. A. K., Nelson, L. D., & Steele, C. M. (2000). Do messages about health risks threaten the self? Increasing the acceptance of threatening health messages via self-affirmation. *Personality and Social Psychology Bulletin, 26*, 1046-1058.
- Solomon, S., Greenberg, J., & Pyszczynski, T. (1991). Terror management theory of self-esteem. In C. R. Snyder & D. Forsyth (Eds.), *Handbook of social and clinical psychology: The health perspective* (pp. 21-40). New York: Pergamon.
- Spencer, S. J., Fein, S., & Lomore, C. D. (2001). Maintaining one's self-image vis-à-vis others: The role of self-affirmation in the social evaluation of the self. *Motivation and Emotion, 25*, 41-65.
- Spencer, S. J., Josephs, R. A., & Steele, C. M. (1993). Low self-esteem: The uphill struggle for self-integrity. In R. Baumeister (Ed.), *Self-esteem and the puzzle of low self-regard*. New York: Plenum.
- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 21, pp. 261-302). New York: Academic Press.
- Steele, C. M., & Liu, T. J. (1983). Dissonance processes as self-affirmation. *Journal of Personality and Social Psychology, 45*, 5-19.
- Steele, C. M., Spencer, S. J., & Lynch, M. (1993). Self-image resilience and dissonance: The role of affirmational resources. *Journal of Personality and Social Psychology, 64*, 885-896.
- Strube, M. J., & Roemmle, L. A. (1985). Self-enhancement, self-assessment, and self-evaluative task choice. *Journal of Personality and Social Psychology, 49*, 981-993.
- Taubman Ben-Ari, O., Florian, V., & Mikulincer, M. (1999). The impact of mortality salience on reckless driving: A test of terror management mechanisms. *Journal of Personality and Social Psychology, 76*, 35-45.
- Tesser, A., & Cornell, D. P. (1991). On the confluence of self processes. *Journal of Experimental Social Psychology, 27*, 501-526.
- Tice, D. M. (1991). Esteem protection or enhancement? Self-handicapping motives and attributions differ by trait self-esteem. *Journal of Personality and Social Psychology, 60*, 711-725.
- Tice, D. M. (1993). The social motivations of people with low self-esteem. In R. F. Baumeister (Ed.), *Self-esteem: The puzzle of low self-regard* (pp. 37-53). New York: Plenum.
- van den Bos, K. (2001). Uncertainty management: The influence of uncertainty salience on reactions to perceived procedural unfairness. *Journal of Personality and Social Psychology, 80*, 931-941.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063-1070.

Received August 22, 2005

Revision accepted June 1, 2006