

Let Us Eat and Drink, for Tomorrow We Shall Die: Effects of Mortality Salience and Self-Esteem on Self-Regulation in Consumer Choice

ROSELLINA FERRARO
BABA SHIV
JAMES R. BETTMAN*

We examine how making mortality salient affects consumer choices. We develop a new theoretical framework predicting when consumer behaviors will be more (less) indulgent when mortality is salient, arguing that individuals focus more of their limited self-regulatory resources on domains that are important sources of self-esteem and less on domains that are not important sources. In two domains, food choice and charitable donations/socially conscious consumer behaviors, high mortality salience led to less indulgent choices among participants for whom that domain was an important source of esteem and more indulgent choices for participants for whom the domain was not an important esteem source.

Individuals display a wide variety of behavioral responses to reminders of the possibility of their own death. In the laboratory, making mortality salient has increased intentions to engage in physical fitness activities (Arndt, Schimel, and Goldenberg 2003), preference for luxury goods (Mandel and Heine 1999) and materialism (Arndt et al. 2004), interest in sex (Goldenberg et al. 2000), and aggressive driving behavior (Ben-Ari, Florian, and Mikulincer 1999). Public events can also make mortality salient and influence behaviors. After September 11, 2001, for example, people reported increases in overeating and going off diets, drinking, smoking, time spent with family and friends, shopping, and church attendance (e.g., Barnes and Petersen 2001).

Terror Management Theory (TMT; Greenberg, Solomon,

and Pyszczynski 1997) provides a framework for understanding such behaviors. Events that remind individuals of death engender existential anxiety, leading to the use of two main coping strategies to alleviate this anxiety, defense of one's cultural worldview and attempts to bolster and enhance self-esteem (Pyszczynski et al. 2004). We focus on the strategy of bolstering/enhancing self-esteem as a buffer against existential anxiety. Terror Management Theory argues that, when mortality is made salient, individuals increase their efforts to live up to the standards upon which their self-esteem is based. For different individuals, the particular domains leading to self-esteem (i.e., domains central to self-worth for which the individual feels capable of living up to the standards) are likely to differ (Crocker et al. 2003). For example, physical appearance may be crucial for one person, while being seen as virtuous may be valued by another. When mortality is salient, individuals will focus attempts to bolster or increase areas of self-esteem that are central to them and in which they can live up to standards.

Volitional acts that bolster or increase self-esteem often require self-regulatory resources (Arndt et al. 1997), which are limited and can be depleted by such volitional actions (Muraven and Baumeister 2000). Pursuit of self-esteem in a domain that is an important potential source of esteem can deplete self-regulatory resources, leaving fewer resources for domains that are not central sources of self-esteem (Crocker and Park 2004). Therefore, individuals may display the greatest self-regulation for areas central to self-esteem

*Rosellina Ferraro is a PhD candidate at the Fuqua School of Business, Duke University, Durham, NC 27708-0120 (rf@mail.duke.edu). Baba Shiv is associate professor of marketing at Graduate School of Business, Stanford University, Stanford, CA 94305-5015 (shiv_baba@gsb.stanford.edu). James R. Bettman is Burlington Industries Professor of Business Administration at the Fuqua School of Business, Duke University, Durham, NC 27708-0120 (jrb12@mail.duke.edu). The authors contributed equally to this research. The authors thank Tanya Chartrand, Irwin Levin, Joshua Weller, participants at the 2003 Columbia Marketing Camp, participants at a marketing faculty seminar at the Fuqua School of Business, Duke University, and the editor and reviewers for their helpful feedback at various stages of this project. The authors also thank Himanshu Mishra, Justin Petersen, and Nikesh Vora for their help in administering the experiments and coding the protocols. The studies were conducted while the second author was at the University of Iowa.

in which they can live up to standards and exhibit the least self-regulation for areas not central to self-esteem or in which the individual has low esteem. Hence, mortality salience can lead to either an increase or a decrease in self-regulation depending upon whether a domain is an important contingency of self-worth for an individual. These effects seem to be specific to making mortality salient and do not hold for other sources of anxiety or other negative experiences (Pyszczynski et al. 2004, 450).

We examine two domains of consumer self-regulation, food choice and charitable donation/socially conscious consumer behaviors, representing two different contingencies of self-worth, appearance for food choice and virtue for donation/socially conscious consumer behaviors. Appearance is an external contingency, requiring others' validation; one's virtue is an internal contingency (Crocker and Park 2004). We find similar results in both domains. When mortality is made salient, those for whom their body or their virtue is a source of self-esteem behave in ways characterized by greater self-regulation, that is, greater choice of a less indulgent food and increased donations and intent to engage in socially conscious consumer behaviors. Those for whom their body or virtue is not an important source of self-esteem display more indulgent behaviors consistent with lower self-regulation, that is, choosing more indulgent food, donating less, and showing lower intent to engage in socially conscious consumer behaviors.

THEORETICAL DEVELOPMENT

Mortality Salience, Self-Esteem, and Self-Regulation

Terror Management Theory postulates that events making an individual's death and mortality more salient lead to potentially overwhelming existential anxiety. Two broad strategies for buffering against such anxiety are defending one's cultural worldview (e.g., acting more aggressively toward a target with different political beliefs) and bolstering and enhancing one's self-esteem (Pyszczynski et al. 2004). We focus on the second strategy, bolstering and enhancing self-esteem.

Making mortality salient increases striving for self-esteem and hence increases behaviors that meet standards of value in domains that are important potential sources of esteem. Two critical implications of this statement are that one must feel capable of behaving in ways that meet standards of value in a domain and that a domain must be an important source of esteem for the individual. For example, Ben-Ari et al. (1999) found that participants for whom driving was relevant to their self-esteem drove (in a car simulator) more aggressively under mortality salience than in the control condition. Driving speed did not differ across conditions for those who indicated that driving was not an important source of self-esteem. Mortality salience also increased fitness behavior intentions for those with high importance on fitness (Arndt et al. 2003) and increased the appeal of physical sex

for those high in body esteem (Goldenberg et al. 2000; for other examples, see Pyszczynski et al. 2004, 439–45).

When mortality is made salient, constructs central to an individual's self-worth become more accessible (Arndt, Greenberg, and Cook 2002) and individuals increase self-esteem striving in important domains that can bolster or enhance their self-esteem. Such volitional actions in the service of self-esteem striving often require self-regulatory resources to suppress death-related anxiety (Arndt et al. 1997) and to initiate and control behaviors. However, self-regulatory resources are limited and can be depleted by such volitional acts (Muraven and Baumeister 2000). Thus, focusing on a domain that is an important source of self-esteem can leave fewer available self-regulatory resources for non-central domains or domains where the individual has low esteem and thus cannot meet standards of value. As Crocker and Park (2004, 408) state, "when people successfully self-regulate in domains on which self-worth is staked, this is likely to consume self-regulatory resources . . . the pursuit of self-regulation may be associated with poor self-regulation in other domains." Mortality salience can lead to different patterns of behavior in different domains depending upon how individuals vary in the importance of the domains for self-esteem and/or their level of esteem in those domains.

We hypothesize that mortality salience interacts with the importance of a domain as a potential source of esteem for an individual to determine behaviors. More precisely, for high mortality salience compared to low mortality salience, an individual for whom a domain is an important source of esteem will show increases in behaviors consistent with self-regulation and meeting standards of value for that domain, whereas an individual for whom a domain is not an important source of self-esteem will engage in more behaviors consistent with poorer self-regulation in that domain. To clarify this general hypothesis, we apply this framework to food choice and to donation/socially conscious consumer behaviors.

Mortality Salience, Body Esteem, and Food Choice

In our first two studies, we examine the choice between chocolate cake and fruit salad. Wertenbroch (1998) has shown that such choices between vice and virtue products can lead to consumer self-control problems. To analyze such a choice, we must consider gender in addition to the factors outlined above. Women are more concerned with physical appearance than men (Crocker et al. 2003), substantially more concerned with weight and dieting than men (Rozin, Bauer, and Catanese 2003), and more likely than men to be dieters (restrained eaters; Hawkins, Turell, and Jackson 1983). We verified this for our subject population in a pretest.

The relative availability of self-regulatory resources plays a critical role in indulgent versus restrained eating behavior for women. Restrained eaters (i.e., females) fail (succeed) at self-regulation and engage in indulgent (less indulgent) food behaviors when they reduce (increase) the amount of attention directed toward the self and the body (e.g., Polivy,

Heatherton, and Herman 1988). Ward and Mann (2000) showed that restrained eaters distracted from the self by higher levels of cognitive load consumed more nacho chips, M&M candies, and chocolate chip cookies than those who were under lower levels of cognitive load. Thus, lowered self-regulatory resources lead to less self-control and more indulgent eating for restrained eaters (i.e., females), so we expect the relative availability of self-regulatory resources to influence women's choices of chocolate cake versus fruit salad.

In our studies, we measure body esteem (Franzoi and Shields 1984). Low-body-esteem women cannot meet standards of value regarding the body and hence will not use the body as a source for self-esteem striving when mortality is made salient. Because self-regulatory resources will be directed toward more promising sources of esteem, they will have reduced self-regulatory resources for food choices under high mortality salience (Goldenberg et al. 2000). The particular choice used, chocolate cake versus fruit salad, also may be particularly demanding of women's self-regulatory resources. Snacks and chocolate are rated higher as comfort foods for women than for men (Wansink, Cheney, and Chan 2003), and over 90% of self-named chocoholics are women (Hetherington and Macdiarmid 1993). This reduction in self-regulatory resources will lead to greater choice of cake for low-body-esteem women under high mortality salience.

In contrast, when mortality is made salient, women with high body esteem are likely to focus their self-regulatory resources on their eating behaviors, and they will be able to control those behaviors so as to meet standards of value and bolster/enhance their self-esteem related to appearance (Goldenberg et al. 2000). Thus, we expect high-body-esteem women to choose fruit salad more frequently under high mortality salience.

Men are generally not dieters (restrained eaters). Because self-regulation of eating is generally not an issue for them, it will not require large amounts of self-regulatory resources. In addition, the particular choice of chocolate cake versus fruit salad may not require substantial self-regulatory resources for males, as noted above. Thus, we expect males' choices of chocolate cake versus fruit salad to be relatively unaffected by levels of mortality salience and body esteem. In sum, we hypothesize a three-way interaction of mortality salience, body esteem, and gender. For low-body-esteem females, choice of the indulgent option (cake) will be higher for high versus low mortality salience; for high-body-esteem females, choice of cake will be lower for high versus low mortality salience. For males, we expect no differences in choice of cake across the mortality salience or body esteem conditions.

Mortality Salience, Virtue, and Donation and Socially Conscious Consumer Behaviors

In our third study, we examine charitable donation behavior and intent to engage in socially conscious consumer behaviors. Participants were told that they would be entered

in a lottery with a \$200 prize for taking part in the study and were asked to decide how much of their potential winnings they wished to donate to charity (the United Way). They also were asked to rate their likelihood of engaging in a variety of socially conscious consumer behaviors (e.g., take public transportation, buy fair trade coffee or chocolate, drive an SUV or truck extensively [reverse coded]).

We use Crocker et al.'s (2003) virtue source of self-esteem as our indicator of the importance of this domain as a source of self-esteem for each participant, allowing us to generalize to a situation where we do not expect gender effects. (Crocker et al. [2003] show that men and women rate virtue equally highly as a source of self-worth.) In addition, we can examine amount donated and an index of socially conscious consumer behaviors.

Our prediction, given our general framework above, is relatively straightforward. We expect an interaction of mortality salience condition with high versus low virtue, with high virtue participants donating greater amounts under high mortality salience than under low mortality salience and low virtue participants donating lower amounts under high mortality salience than under low mortality salience.

EXPERIMENT 1

Experiment 1 examines the effects of mortality salience on choices of an indulgent food option and the role of gender and body esteem in moderating these effects. In this experiment, one option was more indulgent (chocolate cake) than the other (fruit salad), especially for women, as noted above. Experiment 1 also attempts to rule out two alternative accounts, one related to mood states and a second related to distraction. We hope to show that the mortality salience manipulation did not affect mood states such as nervousness, distress, and fear, which have been shown to engender indulgent food-related behaviors (e.g., Tice, Bratslavsky, and Baumeister 2001). We also test a second alternative explanation, that mortality salience and resultant death-related thoughts are a source of distraction and reduce the total level of self-regulatory resources in general, whereas our theory argues that mortality salience alters the focus of allocation of those resources. We use a measure of the extent to which individuals deliberated about their decision to examine the effect on total deliberation. We demonstrate effects on the focus of resources in experiments 2 and 3.

Design and Procedure

The experiment used a 2 (mortality salience: high vs. low) \times 2 (gender) \times 2 (body esteem: high vs. low) between-subjects design, with mortality salience manipulated and body esteem a measured factor dichotomized using a median split. One hundred twenty-seven participants (62 females and 65 males) were randomly assigned to the two mortality salience conditions. The procedure for the experiment was adapted from Shiv and Fedorikhin (1999). Participants were told that the study was about the effects of a change in environment on people's memories for events, that they

would be asked to describe an event that occurred recently, and that as compensation for taking part in the study they would be provided with a choice of snacks (no mention was made of the nature of these snacks). Participants were administered the mortality salience manipulations, responded to a series of mood measures, chose between chocolate cake and fruit salad, and completed a series of scales measuring body esteem and serving as a manipulation check.

Arndt et al. (2002, 320) present a process model of mortality salience effects with an initial stage in which "death thoughts first provoke proximal defenses designed to remove death-related cognitions from conscious awareness." Increased accessibility of death-related thoughts occurs with delay, with worldview defense or self-esteem bolstering used as distal defenses to combat the anxiety raised by mortality salience. Thus, a delay period is necessary for standard mortality salience effects to occur, and our procedure provided the requisite delay between the mortality salience manipulation and choice.

Participants in the high mortality salience condition were asked to describe "what you remember about the September 11 tragedy—where you were when you first got the news, the thoughts that went through your mind and the emotions you experienced on receiving the news, what you did immediately after receiving the news, and for a few days after the tragedy." Participants in the control condition were given the same instructions but in reference to a fire that occurred in November 2001 in the Old Capitol dome on the campus where the study was conducted, with no deaths. Participants then decided in private which snack they would like to have.

Measures

Immediately after the mortality salience manipulation, participants responded to a 20-item PANAS mood scale (Watson, Clark, and Tellegen 1988), which had 10 positive items ($\alpha = .74$) and 10 negative items ($\alpha = .77$). Participants then rated the extent to which they deliberated on their decision about which snack to choose, using three seven-point scales (very low to very high) about the extent to which they deliberated, the time they spent thinking, and the amount of attention they paid to the task ($\alpha = .79$). Shiv, Edell-Britton, and Payne (2004) show in their studies that this measure is sensitive to manipulations of cognitive load. Participants also responded to a series of 15 true/false statements that served as a manipulation check for the mortality salience manipulation. This measure has been used previously to manipulate mortality salience (e.g., Goldenberg et al. 2000) and includes statements such as "I am very much afraid to die" and "I often think about how short life really is." Body esteem was measured using the Franzoi and Shields (1984) Body Esteem Scale (BES), which captures how positively or negatively a person feels about the various physical features and functions of his/her body. Participants then indicated their gender and were debriefed.

Results

Manipulation Check. The 15 true/false statements about thoughts of death revealed only a main effect of mortality salience. Importantly, there were no gender differences and no interactions involving gender. The number of statements to which participants agreed was significantly higher for high ($M = 6.77$) than for low mortality salience ($M = 5.12$; $F(1, 125) = 26.51, p < .0001$).

Choice. Choice of the chocolate cake across the various conditions is presented in figure 1. In line with our predictions, a logistic regression analysis revealed a significant mortality salience by BES by gender interaction ($\chi^2 = 7.03$; $p < .008$) in addition to a marginal main effect of mortality salience ($\chi^2 = 3.67$; $p < .06$), a significant main effect of BES ($\chi^2 = 6.87$; $p < .009$), and significant two-way interactions between BES and gender ($\chi^2 = 7.36$; $p < .007$) and between mortality salience and BES ($\chi^2 = 5.72$; $p < .02$; here and in the remaining analyses in this article, the chi-square statistics have one degree of freedom).

Consistent with our hypothesis, choice of chocolate cake among females low on body esteem was significantly higher when mortality salience was high (94.1%) than when it was low (43.8%; $\chi^2 = 8.89$; $p < .008$). Further, choice of chocolate cake among high-body-esteem females was marginally lower when mortality salience was high (23.1%) than when it was low (37.5%; $\chi^2 = 3.59$; $p < .06$). Finally, choice of chocolate cake among males was no different across the high (40.6%) and low mortality salience conditions (36.4%; $p > .20$).

Ruling out Alternative Accounts Related to Mood and Distraction. Previous research has shown that participants' mood states are unaffected by mortality salience, and we showed that this was the case in our research as well. Separate ANOVAs on respondents' overall positive and negative mood state indices and on the 20 individual items revealed no significant treatment effects ($p > .20$). In particular, ANOVAs on PANAS items related to emotional distress (i.e., nervous, scared, distressed, upset, afraid, and jittery) all revealed insignificant treatment effects ($p > .20$). These results suggest that mood states did not account for the effects of mortality salience on subsequent indulgent choices.

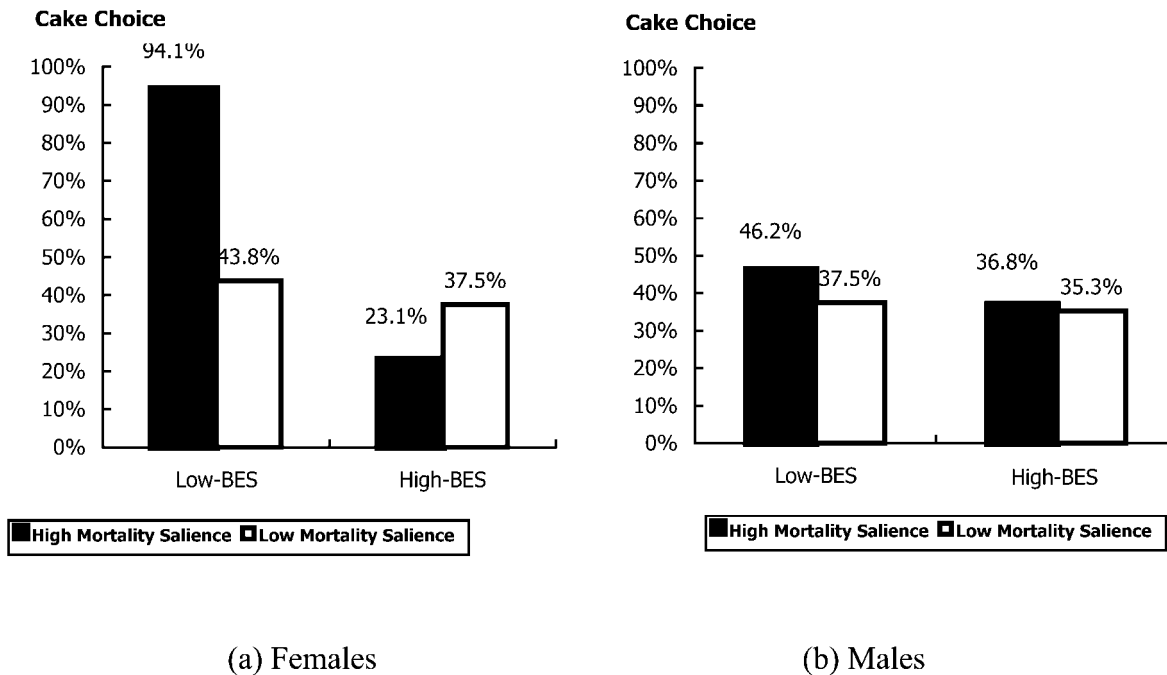
Another account for our findings is that individuals in the high mortality salience condition were under higher levels of distraction. An ANOVA on the extent to which participants deliberated on their snack decisions revealed no significant treatment effects ($p > .20$), suggesting that distraction did not account for mortality salience's effect on choices.

Discussion

In a context where one option is more indulgent than the other, individuals' choices are influenced by mortality salience, gender, and the individual's body esteem, supporting

FIGURE 1

EXPERIMENT 1: CHOICE OF THE INDULGENT OPTION (CHOCOLATE CAKE)



our theoretical framework for how mortality salience, self-esteem, and self-regulatory resources interact to influence behavior. Choice of the chocolate cake was higher among females low on body esteem when mortality salience was high than when it was low, whereas for females high on body esteem choice of the chocolate cake was lower when mortality salience was high than when it was low. Males were unaffected by the mortality salience manipulation.

Chocolate is rated higher as a comfort food and is more likely to be a source of food addiction for women than for men, so women may have had to use more self-regulatory resources than men in attempting to control their food choices in this experiment. If we had used a food that was more tempting to men than to women, it is possible we could have obtained different patterns across genders.

Experiment 1 also ruled out the possibility that the effects of mortality salience on indulgent choices were due to mood states of the participants or levels of distraction during the choice task. The lack of effects on mood scales is typical of research on mortality salience. Researchers of TMT offer two explanations for why there are no effects on specific mood scales related to anxiety: it is the potential for, rather than the experience of, death-related anxiety that leads to typical TMT effects (Greenberg et al. 2003), and such anxiety may be at a nonconscious or implicit level and thus not assessed well by self-report mood scales (Arndt et al. 1997).

EXPERIMENT 2

In experiment 2, we examine the role of making earlier coping behaviors salient in moderating the effects observed in experiment 1. In our conceptualization, mortality salience increases the potential for existential anxiety; individuals then cope with such anxiety by bolstering or enhancing self-esteem. However, if participants are able to reduce existential anxiety using a coping strategy other than self-esteem striving, they will have no need to use self-regulatory resources in the service of self-esteem striving. Hence, there will be no differences in the availability of regulatory resources across body esteem conditions when coping is salient, and the effects of mortality salience on indulgent choices observed in experiment 1 should not occur. This logic formed the basis for experiment 2. Specifically, one group of participants was asked to remember how they coped following either September 11 or the Old Capitol fire, while another group was not asked to do so. If our conceptualization is valid, then we ought to replicate the findings of experiment 1 among those participants for whom how they coped was not made salient. However, with reduced need for self-esteem striving, choices of cake should be no different across mortality salience and body esteem conditions under high coping salience and should be similar

to cake choices under the low mortality salience, low coping salience conditions.

We also provide more direct evidence for our proposed process. We have argued that self-regulatory resources are directed more toward central sources of self-esteem for the individual, depleting the availability of self-regulatory resources for domains not central to self-esteem or in which the individual has low esteem. Cognitive responses reflecting what thoughts came to mind while participants were deciding between the two options should provide indicators of the allocation of self-regulatory resources. We code these responses for body-esteem-related thoughts and predict that, when coping is not made salient (no recall of coping behaviors), there will be more body-esteem-related thoughts for high-body-esteem individuals under high rather than low mortality salience and fewer such thoughts for low-body-esteem individuals under high rather than low mortality salience (Goldenberg et al. 2000). We also predict, in line with our coping rationale above, that the number of thoughts related to body esteem will be essentially the same for the high coping salience conditions and the low mortality salience, low coping salience conditions. We predict that these body-esteem-related thoughts will parallel the effects of the independent variables on the choice of chocolate cake versus fruit salad. To our knowledge, previous research has not examined such cognitive responses related to body esteem to document thought focus.

Design and Procedure

Since the effects of mortality salience on indulgent food choices were found for females and not males in experiment 1, only females participated in experiment 2. Experiment 2 used a 2 (mortality salience: high vs. low) \times 2 (coping salience: high vs. low) \times 2 (body esteem: high vs. low) between-subjects design, with mortality salience and coping salience manipulated and body esteem dichotomized using a median split. One hundred nineteen female participants were randomly assigned to the four mortality salience/coping salience conditions. The procedure and measures closely paralleled those used in experiment 1, except that cognitive responses were collected following choice by having participants report whatever thoughts went through their minds while deciding between the two options.

The instructions for manipulating the mortality salience factor were similar to those used in experiment 1, with the following sentence added to the instructions in the high coping salience conditions: "When describing these thoughts and emotions, focus on how you coped with news of the tragedy." In the low coping salience conditions, this sentence was replaced with: "When describing these thoughts and emotions, focus on your experiences following the news of the tragedy."

Results

Manipulation Check. As in experiment 1, 15 true/false statements about thoughts of death assessed the success of

the mortality salience manipulation. An ANOVA on the number of statements to which participants agreed revealed a main effect of mortality salience, and none of the other main effects or interactions was significant. The number of statements to which participants agreed was significantly higher for high ($M = 8.96$) than for low mortality salience ($M = 7.64$; $F(1, 125) = 8.92$, $p < .004$).

Choice. Choice of chocolate cake across the various conditions is presented in figure 2. In line with our predictions, a logistic regression analysis revealed a significant mortality salience by BES by coping salience interaction ($\chi^2 = 6.30$; $p < .01$) in addition to a marginal main effect of BES ($\chi^2 = 3.30$; $p < .07$), a marginal interaction between BES and coping salience ($\chi^2 = 3.02$; $p < .08$), and a significant interaction between mortality salience and BES ($\chi^2 = 5.15$; $p < .03$).

Results in the low coping salience conditions were similar to those in experiment 1 (see fig. 2, *a*). Consistent with our hypothesis, choice of the chocolate cake among females low on body esteem was significantly higher when mortality salience was high (84.6%) than when it was low (38.5%; $\chi^2 = 7.48$; $p < .007$). Further, choice of the chocolate cake among females high on body esteem was marginally lower when mortality salience was high (17.7%) than when it was low (37.5%; $\chi^2 = 2.72$; $p < .10$). As shown in figure 2, *b*, in the high coping salience conditions, choice of the chocolate cake was no different across the high and low mortality salience conditions, both among participants low on body esteem (44.4% and 31.3%, respectively; $p > .20$) and those high on body esteem (41.7% and 28.6%, respectively; $p > .20$).

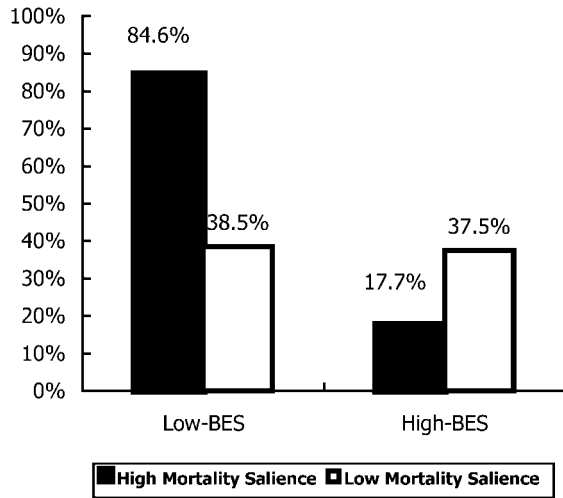
Cognitive Response Data. Participants' cognitive responses were coded by an independent judge for the number of thoughts related to body esteem, that is, any statements related to appearance, weight, and health. Figure 3 shows that the pattern of results for number of body-esteem-related thoughts mirrored the choice frequencies. An ANOVA on the number of body-esteem-related thoughts revealed a significant mortality salience by BES by coping salience interaction ($F(1, 109) = 5.36$; $p < .02$), a marginal interaction between BES and coping salience ($F(1, 109) = 3.00$; $p < .09$), and a significant interaction between mortality salience and BES ($F(1, 109) = 5.26$; $p < .03$).

In line with our conceptualization, the pattern of results for body-esteem-related thoughts in the low coping salience conditions (see fig. 3, *a*) was similar to the choice patterns in the low coping salience conditions. Specifically, the average number of body-esteem-related thoughts among participants low on body esteem was significantly lower when mortality salience was high ($M = .31$) than when it was low (1.23; $F(1, 109) = 5.12$; $p < .03$), whereas the average number of body-esteem-related thoughts among participants high on body esteem was higher when mortality salience was high (2.11) than when it was low (1.19; $F(1, 109) = 5.55$; $p < .02$). As shown in figure 3, *b*, in the high coping salience conditions, the average number of body-esteem-

FIGURE 2

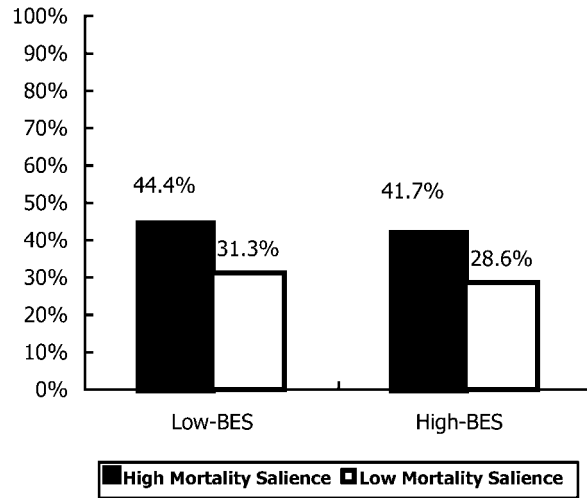
EXPERIMENT 2: CHOICE OF THE INDULGENT OPTION (CHOCOLATE CAKE)

Cake Choice



(a) Low Coping Salience

Cake Choice

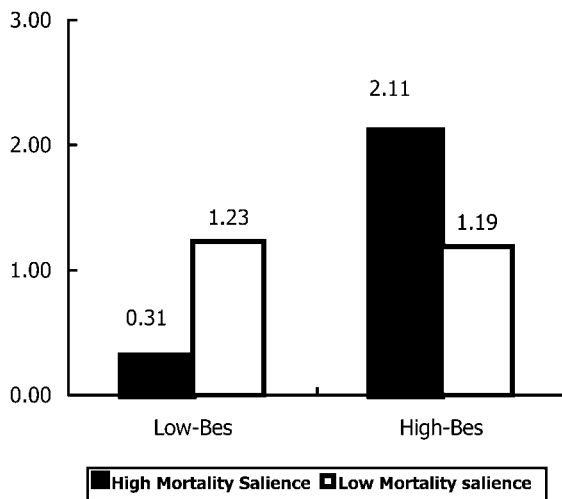


(b) High Coping Salience

FIGURE 3

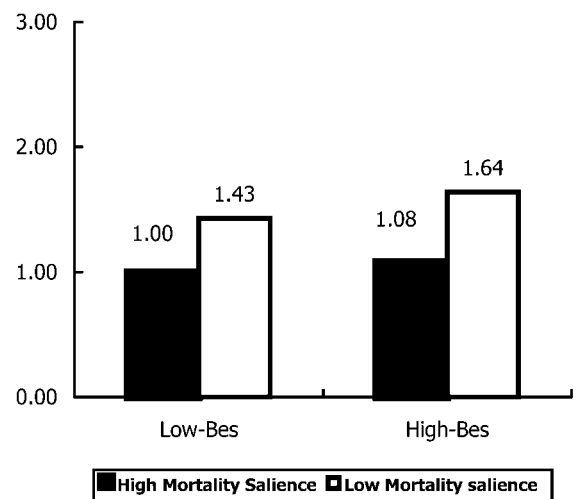
EXPERIMENT 2: NUMBER OF BODY-ESTEEM-RELATED THOUGHTS

Body-esteem thoughts



(a) Low Coping Salience

Body-esteem thoughts



(b) High Coping Salience

related thoughts was no different across the high and low mortality salience conditions, both among participants low on body esteem ($M = 1$ and $M = 1.43$, respectively; $p > .20$) and those high on body esteem ($M = 1.08$ and $M = 1.64$, respectively; $p > .20$). As expected, the number of body esteem thoughts is essentially the same for the high coping salience and the low mortality salience, low coping salience conditions. Thus, these results parallel the choice results.

Ruling out Alternative Accounts Related to Mood and Distraction. As in experiment 1, there were no significant treatment effects on the overall positive and negative mood indices or any of the individual scale items. Further, as in experiment 1, an ANOVA on the extent to which participants deliberated on their decisions about which snack to choose revealed no significant treatment effects ($p > .20$).

Discussion

The results of experiment 2 provide further support for our conceptualization. The experiment 1 findings were replicated in the low coping salience conditions of experiment 2. Choice of the chocolate cake was higher among female participants low in body esteem when mortality salience was high than when it was low, whereas choice of the chocolate cake was lower when mortality salience was high than when it was low for females high in body esteem. Participants were relatively unaffected by the mortality salience manipulation under high coping salience conditions. Critical support for our theoretical framework and proposed process was obtained by coding participants' thought protocols for body-esteem-related thoughts. The number of such thoughts paralleled the effects of the independent variables on choice.

EXPERIMENT 3

In experiment 3, we extend the findings of the earlier experiments to a new behavioral domain, namely, virtuous behaviors such as donating money to a charity or intending to engage in socially conscious consumer behaviors. We examine the role of another source of self-esteem, virtue, in moderating such effects under mortality salience. Individuals low on virtue as a source of esteem could be construed as behaving more indulgently if they are less likely to engage in such virtuous behaviors.

Experiment 3 differed from the earlier experiments in other respects as well. In addition to using a different set of dependent measures (amount donated to a charity and intentions to engage in various socially conscious consumer behaviors) and a different source of self-esteem (i.e., virtue), experiment 3 used a more traditional approach to manipulating mortality salience, asking participants two questions about either the prospect of their own death or about dental pain (e.g., Arndt et al. 2002). Finally, instead of using thought protocols to assess the focus of participants' self-regulatory processes, experiment 3 used a set of scale items.

Design and Procedure

Experiment 3 used a 2 (mortality salience: high vs. low) \times 2 (self-esteem related to virtue: high vs. low) between-subjects design with the former factor manipulated and the latter measured (dichotomized using a median split). One hundred fifteen participants were randomly assigned to the two levels of mortality salience, and the procedure closely paralleled that used in experiments 1 and 2. Participants were told that as compensation for taking part in the study they would be entered in a lottery, if they were the lucky winner they would receive \$200, and they had the option of contributing any part of their winnings to a charity (the lottery was actually carried out).

Participants then responded to the Contingencies of Self-Worth Scale (Crocker et al. 2003), which includes five items related to virtue as a source of self-esteem ($\alpha = .81$). To manipulate mortality salience, participants in the mortality salience condition responded to two open-ended questions often used in previous TMT research (e.g., Arndt et al. 2002): "In the space provided, 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." Participants in the control condition responded to two open-ended questions about dental pain (e.g., Arndt et al. 2002): "In the space provided, please briefly describe the emotions that dental pain arouses in you," and "Jot down, as specifically as you can, what happens to you when you experience dental pain."

Participants then responded to PANAS mood scales, proceeded to another room one individual at a time, and decided how much they would contribute to a charity (the United Way) if they won the lottery. Participants then indicated their intentions to engage in 28 different behaviors over the coming year on five-point extremely unlikely to extremely likely scales. Eighteen were socially conscious consumer behaviors that should be related to virtue as a source of self-esteem (e.g., "Refuse to buy a product if it is made using child or sweat shop labor"); 10 were filler items unrelated to virtue (e.g., "Attend a live music concert"). Finally, participants completed questions serving as a manipulation check, scales measuring level of deliberation, and scales measuring the extent to which participants focused on various aspects of self while deciding about how much to donate (five of these items related to virtue as a source of esteem, e.g., "how ethical a person I am"). We use focus on virtue as an indicator of our proposed process and predict that the degree of focus on virtue will mirror the results for donation and intent to engage in socially conscious behaviors and will parallel the effects of the independent variables on these behaviors.

Results

Manipulation Check. As in experiments 1 and 2, an ANOVA on the number of the 15 true/false statements about thoughts of death to which participants agreed revealed a

main effect of mortality salience, and none of the other main effects or interactions was significant. The number of statements to which participants agreed was significantly higher for high ($M = 8.05$) than for low mortality salience ($M = 6.63$; $F(1, 111) = 5.90, p < .02$).

Donation to the Charity. The average amounts that participants reported that they would donate to the charity from their potential lottery winnings (\$200) across the various conditions are presented in figure 4. The results were consistent with our conceptualization. An ANOVA revealed a significant mortality salience by self-esteem interaction ($F(1, 111) = 6.63, p < .01$) and a significant main effect of self-esteem ($F(1, 111) = 3.89, p < .05$). Planned contrasts revealed that, among participants high on virtue as a source of self-esteem, the average amount that would be contributed to the charity was significantly higher in the high ($M = \$65.00$) than in the low mortality salience condition ($M = \$34.50$; $F(1, 111) = 4.96, p < .03$). Although the average amount given to the charity by individuals low on virtue as a source of self-esteem was not significantly different across the high and low mortality salience conditions, the results were directionally consistent with our conceptualization (\$20.36 and \$28.60, respectively, in the high and low mortality salience conditions). Results for the proportion of participants choosing to donate were similar.

Intentions to Engage in Socially Conscious Consumer Behaviors. Each participant's responses to the 18 socially conscious consumer behaviors were added to form an index (since five-point scales were used for this purpose, the minimum value on this index is 18 and the maximum is 90). An ANOVA on this index revealed a significant mortality

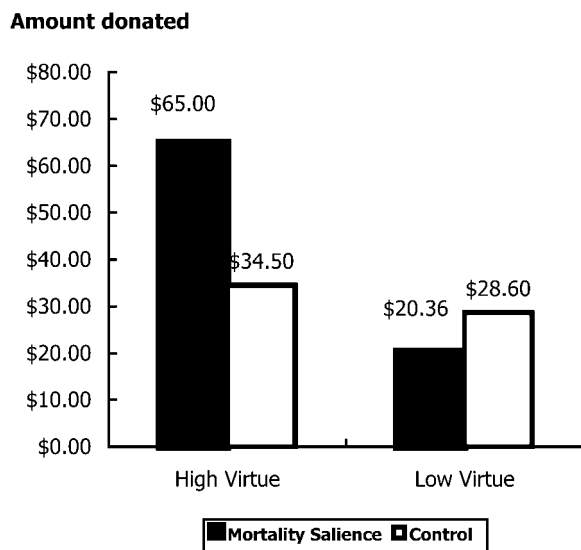
salience by self-esteem interaction ($F(1, 111) = 21.07, p < .0001$) and a significant main effect of self-esteem ($F(1, 111) = 20.53, p < .0001$). Planned contrasts revealed that, among participants high on virtue as a source of self-esteem, the mean index value was significantly higher in the high ($M = 67.7$) than in the low mortality salience condition ($M = 59.1$; $F(1, 111) = 12.52, p < .0006$). Further, among participants low on virtue as a source of self-esteem, the mean of the index was significantly lower in the high ($M = 51.9$) than in the low mortality salience condition ($M = 59.0$; $F(1, 111) = 8.29, p < .005$).

Focus on Virtue while Deciding on the Donation to Charity and Socially Conscious Consumer Behaviors. Participants indicated on five seven-point scale items (not at all to a great extent) the extent to which they focused on virtuous aspects of the self ($\alpha = .90$). An ANOVA on focus on virtue revealed a significant mortality salience by self-esteem interaction ($F(1, 111) = 6.72; p < .01$) and a significant main effect of self-esteem ($F(1, 111) = 7.35; p < .008$). Consistent with the results on the amount to be donated and the index of socially conscious consumer behaviors, planned contrasts revealed that, among participants high on virtue as a source of self-esteem, focus on virtue was significantly higher in the high ($M = 4.82$) than in the low mortality salience condition ($M = 3.97$; $F(1, 111) = 4.27, p < .04$). Further, among participants low on virtue as a source of self-esteem, focus on virtue was marginally lower in the high ($M = 3.26$) than in the low mortality salience condition ($M = 4.00$; $F(1, 111) = 3.14, p < .07$). Thus the results for focus on virtue parallel the donation and behavior intention results.

Ruling out Alternative Accounts Related to Mood and Distraction. As in experiments 1 and 2, there were no significant treatment effects on the overall positive and negative mood indices or any of the individual scale items. As in experiments 1 and 2, an ANOVA on the extent to which participants deliberated on their decisions revealed no significant treatment effects ($p > .20$).

FIGURE 4

EXPERIMENT 3: AMOUNT DONATED TO CHARITY



Discussion

Experiment 3 extended experiments 1 and 2 with a different set of dependent measures (amount to be donated to a charity and intentions to engage in various socially conscious consumer behaviors), a different source of self-esteem (i.e., virtue), and a more traditional approach to manipulating mortality salience. Consistent with our conceptualization, among individuals high on virtue as a source of self-esteem, the decision to give to charity, the amount contributed to the charity, and intentions to engage in socially conscious consumer behaviors were higher when mortality salience was high than when it was low. This pattern reversed for individuals low on virtue as a source of self-esteem, and their behaviors under mortality salience could thus be considered more indulgent (e.g., greater likelihood of keeping any money won to spend on themselves or being significantly more likely

to drive an SUV or truck extensively in the coming year). Further support was obtained by examining the extent to which participants focused on virtuous aspects of their self while making their decisions. The focus on virtue variable paralleled the effects of the independent variables on the dependent measures. Finally, unlike the previous two experiments, in this experiment there were no main effects or interactions with gender; both men and women reacted similarly to virtue as a source of esteem under mortality salience.

GENERAL DISCUSSION

Making death and individuals' mortality more salient can influence a wide variety of behaviors. We develop a new, integrated framework based on how mortality salience, self-esteem, and self-regulatory resources interact to determine how individuals use behaviors that bolster/enhance self-esteem as a way of coping with existential anxiety. We note that people have different sources of self-esteem and use limited self-regulatory resources to focus on sources of esteem that are important to them, resulting in depleted self-regulatory resources and hence lower self-regulation for domains that are not important sources of self-esteem. Thus, we provide a new theory for the effects of mortality salience on self-regulation in consumer choice.

We support this theory with three studies demonstrating how making mortality salient can lead to more or less indulgent choices, two involving food choice and one examining donation behavior and intent to engage in socially conscious consumer behaviors. Our results in all these studies show that individuals engage in less (more) indulgent behaviors when mortality is salient and the domain is (is not) an important source of self-esteem for the individual. This is consistent with the notion that "identification with an aspect of self and positive evaluation of one's standing on that dimension are both necessary for one to derive self-esteem and thus for protection against mortality concerns" (Goldenberg et al. 2000, 123).

Other results provide important new evidence for our proposed process. Our theory implies that individuals for whom a domain is an important source of self-esteem should focus self-regulatory resources on that domain to a greater extent under high rather than low mortality salience. Conversely, we predict that individuals for whom a domain does not serve as an important source of self-esteem should show decreased focus of self-regulatory resources on that domain under high as opposed to low mortality salience. In experiments 2 and 3, we provide support for this important aspect of our theory, using coded cognitive responses in experiment 2 and scales measuring focus in experiment 3. In particular, these two different measures of focus show responses to our manipulations parallel to those of our dependent measures. To our knowledge, this is the first process evidence of this type to be reported.

We also provide evidence against several alternative explanations for the results. First, mood explanations were ruled out by showing that there were no mood differences between the high and low mortality salience conditions in

experiments 1, 2, and 3. We also show in experiments 1, 2, and 3 that there is no evidence that mortality salience leads to distraction that reduces self-regulatory resources in general by consistently showing no effects on a deliberation index that has proven sensitive to effects of cognitive load in other research (Shiv et al. 2004).

One issue that has been addressed in TMT is whether the effects found in the literature are unique to death-related thoughts. That is, could other sources of anxiety or negative stimuli yield the same results? The answer appears to be that such results are indeed specific to existential anxiety about death. Such conditions as experiencing dental pain, giving a speech, being socially excluded, failing an exam, and anxiety about the future have not yielded effects similar to those obtained by manipulating mortality salience. Recent studies have also shown that increasing participants' faith in life after death eliminates mortality salience effects (for a summary of such research, see Pyszczynski et al. [2004], 450–52).

Recently Burris and Rempel (2004) have argued that objects, places, relationships, beliefs, or membership in a group can serve as identity markers that symbolize a person's self. They argue that loss or destruction of an identity marker (one example of what they call a "spatial-symbolic threat") is a destruction of part of the self, as death is a total destruction of the self. They use the example of special possessions as one such identity marker and argue that one of their studies shows that a spatial-symbolic threat has comparable effects to a mortality salience manipulation. We ran a condition in our charity donation study in which individuals were asked to describe the emotions the thought of losing their most cherished possession would arouse and what they thought would happen to them after they lost the possession. The results for this condition were not different from the control condition and differed from the mortality salience condition. Thus, we do not replicate their results. At this time, therefore, the preponderance of the evidence favors the view that mortality salience does lead to unique effects.

In conclusion, making mortality salient, whether via external events or in the laboratory, can have substantial effects on consumption behaviors. How people respond to events that make mortality more salient will depend upon which sources of self-esteem are most important and salient to each individual and how favorably or unfavorably that individual views him/herself on that source of self-esteem.

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REFERENCES

- Arndt, Jamie, Jeff Greenberg, and Alison Cook (2002), "Mortality Salience and the Spreading Activation of Worldview-Relevant Constructs: Exploring the Cognitive Architecture of Terror Management," *Journal of Experimental Psychology: General*, 131 (September), 307–24.
- Arndt, Jamie, Jeff Greenberg, Sheldon Solomon, Tom Pyszczynski,

- and Linda Simon (1997), "Suppression, Accessibility of Death-Related Thoughts, and Cultural Worldview Defense: Exploring the Psychodynamics of Terror Management," *Journal of Personality and Social Psychology*, 73 (July), 5–18.
- Arndt, Jamie, Jeff Schimel, and Jamie L. Goldenberg (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 (August), 1726–46.
- Arndt, Jamie, Sheldon Solomon, Tim Kasser, and Kennon M. Sheldon (2004), "The Urge to Splurge: A Terror Management Account of Materialism and Consumer Behavior," *Journal of Consumer Psychology* 14 (3), 198–212.
- Barnes, Brooks and Andrea Petersen (2001), "As Priorities Change, Some Question Why They Eschew the Fat," *Wall Street Journal*, October 5, A1, A4.
- Ben-Ari, Orit Taubman, Victor Florian, and Mario Mikulincer (1999), "The Impact of Mortality Salience on Reckless Driving: A Test of Terror Management Mechanisms," *Journal of Personality and Social Psychology*, 76 (January), 35–45.
- Burris, Christopher T. and John K. Rempel (2004), "'It's the End of the World as We Know It': Threat and the Spatial-Symbolic Self," *Journal of Personality and Social Psychology*, 86 (January), 19–42.
- Crocker, Jennifer, Riia K. Luhtanen, M. Lynne Cooper, and Alexandra Bouvrette (2003), "Contingencies of Self-Worth in College Students: Theory and Measurement," *Journal of Personality and Social Psychology*, 85 (November), 894–908.
- Crocker, Jennifer and Lora E. Park (2004), "The Costly Pursuit of Self-Esteem," *Psychological Bulletin*, 130 (May), 392–414.
- Franzoi, Stephen L. and Stephanie A. Shields (1984), "The Body Esteem Scale: Multidimensional Structure and Sex Differences in a College Population," *Journal of Personality Assessment*, 48 (April), 173–78.
- Goldenberg, Jamie L., Shannon K. McCoy, Tom Pyszczynski, Jeff Greenberg, and Sheldon Solomon (2000), "The Body as a Source of Self-Esteem: The Effect of Mortality Salience on Identification with One's Body, Interest in Sex, and Appearance Monitoring," *Journal of Personality and Social Psychology*, 79 (July), 118–30.
- Greenberg, Jeff, Andy Martens, Eva Jonas, Donna Eisenstadt, Tom Pyszczynski, and Sheldon Solomon (2003), "Psychological Defense in Anticipation of Anxiety: Eliminating the Potential for Anxiety Eliminates the Effect of Mortality Salience on Worldview Defense," *Psychological Science*, 14 (September), 516–19.
- Greenberg, Jeff, Sheldon Solomon, and Tom Pyszczynski (1997), "Terror Management Theory of Self-Esteem and Cultural Worldviews: Empirical Assessments and Conceptual Refinements," in *Advances in Experimental Social Psychology*, Volume 29, ed. Mark P. Zanna, San Diego, CA: Academic Press, 61–136.
- Hawkins, Raymond C., Susan Turell, and Linda J. Jackson (1983), "Desirable and Undesirable Masculine and Feminine Traits in Relation to Students' Dieting Tendencies and Body Image Dissatisfaction," *Sex Roles*, 9 (June), 705–18.
- Hetherington, Marion M. and Jennifer I. Macdiarmid (1993), "'Chocolate Addiction': A Preliminary Study of Its Description and Its Relationship to Problem Eating," *Appetite*, 21 (December), 233–46.
- Mandel, Naomi and Steven J. Heine (1999), "Terror Management and Marketing: He Who Dies with the Most Toys Wins," in *Advances in Consumer Research*, Volume 26, ed. Eric J. Arnould and Linda M. Scott, Provo, UT: Association for Consumer Research, 527–32.
- Muraven, Mark and Roy F. Baumeister (2000), "Self-Regulation and Depletion of Limited Resources: Does Self-Control Resemble a Muscle?" *Psychological Bulletin*, 126 (March), 247–59.
- Polivy, Janet, Todd F. Heatherton, and C. Peter Herman (1988), "Self-Esteem, Restraint, and Eating Behavior," *Journal of Abnormal Psychology*, 97 (August), 354–56.
- Pyszczynski, Tom, Jeff Greenberg, Sheldon Solomon, Jamie Arndt, and Jeff Schimel (2004), "Why Do People Need Self-Esteem? A Theoretical and Empirical Review," *Psychological Bulletin*, 130 (May), 435–68.
- Rozin, Paul, Rebecca Bauer, and Dana Catanese (2003), "Food and Life, Pleasure and Worry, among American College Students: Gender Differences and Regional Similarities," *Journal of Personality and Social Psychology*, 85 (July), 132–41.
- Shiv, Baba, Julie A. Edell-Britton, and John W. Payne (2004), "Does Elaboration Increase or Decrease the Effectiveness of Negatively versus Positively Framed Messages?" *Journal of Consumer Research*, 31 (June), 199–208.
- Shiv, Baba and Alexander Fedorikhin (1999), "Heart and Mind in Conflict: The Interplay of Affect and Cognition in Consumer Decision Making," *Journal of Consumer Research*, 26 (December), 278–92.
- Tice, Dianne M., Ellen Bratslavsky, and Roy F. Baumeister (2001), "Emotional Distress Regulation Takes Precedence over Impulse Control: If You Feel Bad, Do It!" *Journal of Personality and Social Psychology*, 80 (January), 53–67.
- Wansink, Brian, Matthew M. Cheney, and Nina Chan (2003), "Exploring Comfort Food Preferences across Age and Gender," *Physiology and Behavior*, 79 (September), 739–47.
- Ward, Andrew and Traci Mann (2000), "Don't Mind If I Do: Disinhibited Eating under Cognitive Load," *Journal of Personality and Social Psychology*, 78 (April), 753–63.
- Watson, David, Lee Anna Clark, and Auke Tellegen (1988), "Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scales," *Journal of Personality and Social Psychology*, 54 (June), 1063–70.
- Werthenbroch, Klaus (1998), "Consumption Self-Control by Rationing: Purchase Quantities of Virtue and Vice," *Marketing Science*, 17 (4), 317–37.