

Reactions to Perceived Fairness: The Impact of Mortality Salience and Self-Esteem on Ratings of Negative Affect

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In correspondence with terror management theory, the findings of two experiments show that reminders of death lead to stronger effects of perceived fairness on ratings of negative affect. Furthermore, in line with the theory's self-esteem mechanism, results of Experiment 1 suggest that state self-esteem may mediate this relationship between mortality salience and fairness. In further correspondence with the self-esteem mechanism, findings of Experiment 2 reveal that introducing an activity (after reminders of death and before the fairness manipulation) with which people can reaffirm positive conceptions of themselves leads people to react less strongly to variations in fairness than not introducing such a self-affirmation activity. These findings suggest that people react especially strongly to perceived fairness when they are in need for a boost in their self-esteem. Implications for the psychology of fairness are discussed.

KEY WORDS: fairness; procedures; outcomes; terror management; self-esteem.

INTRODUCTION

The norms and values of fairness and justice constitute a fundamental feature of human life. Not surprisingly, therefore, the issue of justice has received considerable attention from philosophers, sociologists, political scientists, legal scholars, economists, and psychologists, among others. Social psychologists have shown convincingly that when people feel they have experienced fair or unfair events this may strongly affect their subsequent reactions (see, e.g., Brockner and

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Wiesenfeld, 1996; Folger and Cropanzano, 1998; Lind and Tyler, 1988; Tyler and Lind, 1992). This suggests that perceived fairness plays a crucial role in social behavior. Folger (1984) has even noted that “the importance of justice cannot be overstated” (p. ix). It is important, therefore, to explore what drives people’s reactions to perceived fairness (e.g., Folger and Cropanzano, 1998; Lind and Tyler, 1988). In the current paper, I will try to focus on this significant question.

An illustration of the effects that perceived fairness can have on people’s reactions can be found in experimental studies in which it is manipulated whether participants receive an outcome that is either equal to the outcome of a comparable other person or that is worse than the outcome of the comparison other (see, e.g., Van den Bos, 1999). Results in these kinds of experiments typically show that outcomes are judged to be more fair when own outcomes are equal to as opposed to worse than the other person’s outcome. More important for the current purposes, findings have revealed fair outcome effects. For example, people have been shown to be less angry after having experienced fair as opposed to unfair outcomes (for an overview, see Adams, 1965).

An alternative way to study people’s reactions to perceived fairness is to vary that participants either are or are not allowed an opportunity to voice their opinion about decisions to be made (e.g., Folger *et al.*, 1979; Van den Bos *et al.*, 1997a). These experiments generally reveal that people judge a voice procedure to be more fair than a no-voice procedure. More important, findings frequently show fair process effects. For example, it has been revealed that people who are allowed voice show less resentment than those who are not allowed voice (for overviews, see, e.g., Folger and Cropanzano, 1998; Lind and Tyler, 1988).

Several reviews of the literature have suggested that to understand the frequently replicated effects of perceived fairness on people’s reactions we have to carefully study the psychological mechanisms underlying these effects (see, e.g., Folger and Cropanzano, 1998; Lind and Tyler, 1988; Tyler and Lind, 1992). Important for the current purposes are studies by Brockner *et al.* (1998) and Vermunt *et al.* (in press). The research findings of these authors revealed that people’s level of self-esteem may moderate how people react to fairness considerations.

In this paper, I try to study psychological mechanisms that may underlie the effects of fairness on human reactions. In doing so, I will rely on insights developed within terror management theory. Compared to previous explanations, the analysis of the psychology of people’s reactions to perceived fairness that will be put forward in the present paper may yield an as yet unidentified and unexplored explanation of these reactions (for an overview of other explanations, see Greenberg and Folger, 1983; Lind and Tyler, 1988; Van den Bos *et al.*, 1997a,b, 1998a,b). After introducing terror management theory, the aims of the current research will be presented.

Terror Management Theory

According to terror management theory (for overviews, see, Greenberg *et al.*, 1997; Pyszczynski *et al.*, 1999; Solomon *et al.*, 1991), the fear of death is rooted in an instinct for self-preservation that humans share with other species. Although human beings share this instinct with other species, only we are aware that death is inevitable. This combination of an instinctive drive for self-preservation with an awareness of the inevitability of death creates the potential for paralyzing terror. Furthermore, the theory posits that this potential for terror is managed by a cultural anxiety buffer, a social psychological structure consisting of (1) people's cultural worldview and (2) their self-esteem. To the extent that this buffer provides protection against death concerns, reminding individuals of their death should increase their need for that buffer. Therefore, reminding people of their death should increase the need for things that provide an opportunity to uphold or reconstruct their worldview and to recover positive levels of self-esteem. As a result, reminders of death should lead to strong positive evaluations of persons or events that uphold or provide an opportunity to reconstruct the cultural worldview and/or self-esteem and lead to strong negative reactions toward things that impinge on people's cultural worldview and/or pose a further threat to people's self-esteem.

In this way, the theory proposes two psychological mechanisms that may help the individual in managing existential terror: One is aimed at validating one's cultural worldview and the rejection of things that violate this worldview. This is labeled as the *cultural worldview mechanism*. The second is aimed at recovering one's sense of self-esteem and avoiding a further decrease in self-esteem. This is called here the *self-esteem mechanism*. (For more extensive introductions to terror management theory, see Greenberg *et al.*, 1997; Pyszczynski *et al.*, 1999; Solomon *et al.*, 1991.)

Although an elaborate overview of the empirical work on terror management is beyond the scope of this paper (for more complete descriptions, see, e.g., Arndt and Greenberg, 1999; Arndt *et al.*, 1999; Ben-Ari *et al.*, 1999; Greenberg *et al.*, 1990; Harmon-Jones *et al.*, 1997; McGregor *et al.*, 1998; Rosenblatt *et al.*, 1989), it should be noted here that research findings are supportive for terror management theory and have revealed evidence for both the cultural worldview mechanism and the self-esteem mechanism. For example, in line with the cultural worldview mechanism, Rosenblatt *et al.* (1989) showed that after reminders of death people attach great importance to their cultural norms and values. More specific, research findings indicated that participants who saw prostitution as a violation of their cultural norms and values recommended harsher punishments for a prostitute when mortality had been made salient than when mortality had not been made salient. Furthermore, results of these authors also revealed that participants who had been reminded about their death recommended larger rewards for a hero who upheld cultural values than did participants who had not been reminded about death.

In accordance with the self-esteem mechanism, Ben-Ari *et al.* (1999, Study 4) showed that after reminders of death people are in need for a boost in their self-esteem. More specific, results of the fourth study conducted by these authors suggested that when mortality had been made salient, receiving positive feedback about driving performance reduced risky driving among participants who derived self-esteem from driving (see also Arndt and Greenberg, 1999; Harmon-Jones *et al.*, 1997). Support for the self-esteem mechanism also is indicated in a recent study by Koole *et al.* (2000) in which it was found that participants' levels of state self-esteem were lower in mortality salient than in nonsalient conditions and that self-esteem mediated participants' reactions to subsequent events. That is, these authors had participants evaluate all 26 letters of the alphabet and took more positive evaluations of first name letters (as opposed to letters that were not in a participant's name) as indicators of higher levels of implicit personal self-esteem. Findings showed that reminding participants about their death led to more negative evaluations of first name letters than not reminding them about death, and that name letter evaluations mediated the relationship between mortality salience and participants' reactions to social transgressions (social transgressions that were presented to the participants in vignettes after mortality salience had been manipulated and name letter evaluations had been assessed; see Koole *et al.*, 2000, Experiment 3).

Van den Bos and Miedema (2000) used terror management theory to understand people's reactions to perceived fairness. More specific, on the basis of terror management theory and the empirical evidence that this framework has generated (see, e.g., Arndt *et al.*, 1999; Arndt and Greenberg, 1999; Ben-Ari *et al.*, 1999; Greenberg *et al.*, 1990, 1997; Harmon-Jones *et al.*, 1997; McGregor *et al.*, 1998; Rosenblatt *et al.*, 1989; Solomon *et al.*, 1991), Van den Bos and Miedema argued that participants who are asked to think about their mortality will react more negatively toward violation and more positively toward things that uphold or bolster cultural norms and values. Furthermore, these authors argued that in most situations most people judge unfair procedures to be in violation with cultural norms and values and think of fair procedures as being in correspondence with norms and values of good behavior and conduct (Lind and Tyler, 1988). On the basis of this line of reasoning, Van den Bos and Miedema predicted that thinking about their mortality should make fairness a more important issue to people. The findings of three experiments supported this line of reasoning: Participants in these experiments were either reminded or not reminded about their mortality after which they experienced either a fair procedure or an unfair procedure. Main dependent variables were ratings of affect. As expected, findings indicated that affect ratings were more positive when participants had experienced fair as opposed to unfair procedures. More important, mortality salience \times fairness manipulation effects were found such that fair process effects were stronger when participants had been asked to think about their mortality than when they had not been asked to think about this subject.

The Current Research

The findings by Van den Bos and Miedema (2000) suggest that reminders of mortality may lead people to react more strongly to variations in fairness. These are important findings for the fairness domain because they contribute to a better understanding of people's reactions to perceived fairness. Furthermore, these findings are important for terror management theory because they specify the framework's explicit contribution to our understanding of one of the most important social norms and values: fairness (as opposed to broader and hence potentially more vague cultural norms about, for example, prostitutes or heroes; cf. Rosenblatt *et al.*, 1989). However, as was noted by Van den Bos and Miedema, further research is needed to understand why these effects were found. This could substantially enhance our insights into both the psychology of fairness and terror management.

I propose here to focus on the self-esteem mechanism of the terror management framework. I suggest to do this because self-esteem plays an important role in social psychology in general (e.g., Heatherton and Polivy, 1991) and because fairness studies suggest that self-esteem is an important moderator of fairness effects (Brockner *et al.*, 1998; Vermunt *et al.*, in press). Another reason why research on the self-esteem mechanism seems warranted is that terror management theory delineates that self-esteem becomes important to people *after* they have been reminded about their mortality. However, according to my knowledge, thus far there have been only two studies—the studies by Ben-Ari *et al.* (1999, Study 4) and Koole *et al.* (2000)—that investigated self-esteem after mortality salience had been manipulated. Other terror management studies have assessed or manipulated self-esteem before manipulating mortality salience (Arndt and Greenberg, 1999; Harmon-Jones *et al.*, 1997). These latter studies are important but have investigated the role of mortality salience and self-esteem in a reversed order compared to what terror management theory delineates. This may imply that these latter studies have tested the self-esteem mechanism in a somewhat indirect way. Thus, we have only two studies—nonfairness experiments—that have focused on the role of self-esteem after mortality salience has been induced (Ben-Ari *et al.*, 1999, Study 4; Koole *et al.*, 2000). In the present paper, I would like to follow up on this and explore the role of self-esteem after mortality salience has been induced on people's reactions to subsequent manipulations of fairness. I will try to show here that this is important for terror management in general and for understanding people's reactions to perceived fairness in particular.

EXPERIMENT 1

To provide first evidence for the role of mortality salience and self-esteem on people's reactions to fairness, participants' perceptions of state self-esteem were

measured after mortality salience and before fairness manipulations had been induced. Following terror management theory and Van den Bos and Miedema (2000), it was predicted that after reminders of mortality participants' reactions would be more strongly affected by variations in fairness than after no reminders of mortality. Furthermore, following the self-esteem mechanism of terror management theory and the study by Koole *et al.* (2000), it was predicted that state self-esteem would be lower in mortality salient as opposed to nonsalient conditions and that state self-esteem would mediate the relationship between the manipulations of mortality salience and fairness.

In Experiment 1, following most previous terror management studies (for overviews, see Greenberg *et al.*, 1997; Pyszczynski *et al.*, 1999; Solomon *et al.*, 1991), the mortality salient condition was induced by having participants write down their responses to two questions about their death. Following previous terror management experiments (e.g., Harmon-Jones *et al.*, 1997), participants in the mortality nonsalient condition were asked to write down their responses to two questions about them watching TV. The fairness manipulation was a manipulation of distributive fairness: Participants were informed that they received an outcome that was equal to the outcome of a comparable other person or that was worse than the outcome of the comparison other (cf. Van den Bos, 1999).

After mortality salience had been induced and before fairness had been manipulated, participants' state self-esteem was measured. Because pilot testing revealed that the assessment of self-esteem should not take a long time to get the predicted effects, and that having participants evaluate all 26 letters of the alphabet (cf. Koole *et al.*, 2000) took too long, it was decided to solicit the two items of the Heatherton and Polivy (1991) explicit state self-esteem questionnaire that had been shown in pilot studies to be most sensitive to the mortality salience manipulation.

After both mortality salience and fairness had been manipulated, dependent variables were assessed. Because it is important to measure people's affective reactions to perceived fairness (Tyler and Smith, 1998; Weiss *et al.*, 1999), and following previous justice research (e.g., Folger *et al.*, 1979; Van den Bos and Miedema, 2000; Van den Bos and Spruijt, in press; Van den Bos and Van Prooijen, in press), main dependent variables in both experiments reported here were ratings of affect. More specific, because findings of Van den Bos and Miedema (2000, Experiment 3) revealed that stronger effects would be found on participants' ratings of negative affect, and because it is important to assess negative affect following perceived fairness (Folger *et al.*, 1979; Folger and Cropanzano, 1998), main dependent variables in both experiments of the current paper were negative affect ratings. In Experiment 1, participants were asked the negative affect item that pilot testing had showed to be most well suited for the mediation hypothesis tested in this experiment.

Method

Participants and Design

One hundred and sixteen students (32 men and 84 women) at Leiden University participated in the experiment and were paid for their participation. Participants were randomly assigned to one of the conditions of the 2 (mortality salience: salient vs. nonsalient) \times 2 (outcome: equal to other vs. worse than other) factorial design. Twenty-nine participants took part in each of the four conditions.

Experimental Procedure

Students at Leiden University were invited to the laboratory to participate in a study on how people perform tasks. On arrival at the laboratory, participants were led to separate cubicles, each of which contained a computer with a monitor and a keyboard. Next to the monitor, participants found pieces of paper and a pencil. Participants were told that the computers were connected to one another and that the experimenter could communicate with them by means of the computer network. The computers were used to present the stimulus information and to collect data on the dependent variables and the manipulation checks. Participants participated in the experiment and answered the questions that constituted the dependent variables and the manipulation checks after participating in another, unrelated study. The studies lasted a total of 90 min and participants were paid 15 Dutch guilders for their participation (1 Dutch guilder equaled approximately \$0.50 U.S. at the time the studies in this paper were conducted).

The experimental paradigm used here closely resembled previous fairness experiments (e.g., Van den Bos, 1999; Van den Bos *et al.*, 1997a; Van den Bos and Miedema, 2000, Experiments 1 and 2). In the first part of the instructions, participants were informed that they participated in the study with another person, referred to as Other. The experimental procedure was then outlined to the participants: After the experimental tasks were explained, participants would practice the tasks for 2 min, after which time they would work on the tasks for 10 min. Furthermore, participants were informed that, after all participants were run, a lottery would be held among all participants. The winner of this lottery would receive 100 Dutch guilders. (Actually, after all participants had completed the experiment, the 100 Dutch guilders were randomly given to one participant; a procedure to which none of the participants objected upon debriefing.) Participants were told that a total of 200 lottery tickets would be divided among all participants. Furthermore, participants were told that after the work round the experimenter would divide some lottery tickets between them and Other. Seven practice questions were posed to ensure comprehension of the lottery. If participants gave a wrong answer to a question, the correct answer was disclosed and main characteristics of the lottery were repeated.

The task was then explained to the participants. Figures would be presented on the upper right part of the computer screen. Each figure consisted of 36 squares, and each square showed one of eight distinct patterns. On the upper left side of the computer screen one of the eight patterns would be presented, and participants had to count the number of squares with this pattern in the figure on the right side of the screen. When participants had indicated the correct number of patterns in the figure on the right side of the screen, another figure and another pattern would be presented on the screen. In both the practice round and the work round, the number of tasks that the participant had completed (i.e., the number of figures that the participant had counted) in the present round would be presented on the lower right side of the screen. On the lower left side of the screen the time remaining in the present round was shown.

The practice round then began, after which the work round began. After the work round had ended, participants were told how many tasks they had completed in the work round, and—in order to ensure that participants compared themselves to Other—it was communicated to the participant that Other had completed an equivalent number of tasks. To assess whether participants thought of Other as a person who was comparable in the amounts of inputs he or she provided (cf. Van den Bos, 1999; Van den Bos *et al.*, 1997a; Van den Bos and Miedema, 2000), they were asked to what extent Other had performed well in the work round relative to the performance of the participant self (1 – much worse, 4 – equally, 7 – much better) and to what extent Other was good in performing the tasks in the work round relative to the participant self (1 – much worse, 4 – equally, 7 – much better). After this, participants were asked to think for 1 min about the percentage of lottery tickets that they should receive relative to Other.

Following Van den Bos and Miedema (2000, Experiments 1 and 2), participants were then told that before the experimenter would divide the lottery tickets between them and Other, they would be asked to complete a number of questions, and that after they would have completed these questions, the study would continue. Mortality salience was then manipulated. As in most previous terror management studies (for overviews, see Greenberg *et al.*, 1997; Pyszczynski *et al.*, 1999; Solomon *et al.*, 1991), the mortality *salient* condition was induced by having participants respond to two questions about death. More specifically, participants in the mortality salient condition were asked to respond to two open-ended questions concerning their thoughts and feelings about their death: Following Van den Bos and Miedema (2000) and previous terror management studies (e.g., Arndt *et al.*, 1999; Greenberg *et al.*, 1990; Harmon-Jones *et al.*, 1997; McGregor *et al.*, 1998), participants were asked to write down on a piece of paper next to the computer their answers to the questions (1) “Please briefly describe the emotions that the thought of your death arouses in you,” and (2) “Please write down, as specifically as you can, what you think will happen to you as you physically die.”

Following previous terror management experiments (e.g., Harmon-Jones *et al.*, 1997), participants in the *nonsalient* condition were asked to respond to

two open-ended questions concerning their thoughts and feelings about watching television: Participants were asked to write down on a piece of paper next to the computer their answers to the questions (1) "Please briefly describe the emotions that the thought of you watching TV arouses in you," and (2) "Please write down, as specifically as you can, what you think physically will happen to you as you watch TV."

After this, all participants completed the Positive and Negative Affect Schedule (PANAS; Watson *et al.*, 1988), on which they reported on 20 items how they felt at the moment. Following previous terror management studies (see Greenberg *et al.*, 1997; Pyszczynski *et al.*, 1999; Solomon *et al.*, 1991; Van den Bos and Miedema, 2000), the PANAS was included as a filler task and to determine if the manipulation of mortality salience engendered positive and negative affect. The PANAS consists of two 10-item subsets (Watson *et al.*, 1988), one measuring positive affect (PA) and one measuring negative affect (NA), and both subsets were averaged to form reliable scales (α s = 0.84 and 0.89, respectively).

After they had answered the PANAS, participants were asked the two questions of the state self-esteem questionnaire by Heatherton and Polivy (1991) that had been shown in pilot studies² to be most sensitive to the mortality salience manipulation: Participants were asked to what extent they agreed with the statements "At this moment, I worry about my performance" (1 – not at all, 5 – extremely) and "At this moment, I feel as smart as others" (1 – not at all, 5 – extremely). Reliability analysis showed that these items could not be taken together to form a scale (α = 0.59), and therefore these items were treated separately in the analyses to be presented later. After they had answered these two questions, all participants were told that by pushing the return button on the keyboard the study would continue.

The outcome that participants received relative to the other participant was then varied: Following Van den Bos (1999), it was communicated to the participants that they received three lottery tickets. Participants in the equal-to-other condition were informed that Other received three tickets. Participants in the worse-than-other condition were informed that Other received five tickets. (In reality, however, all stimulus information was preprogrammed; a procedure to which none of the participants objected upon debriefing.)

This was followed by the assessment of the dependent variable and the manipulation checks. All ratings were made on 7-point scales. Main dependent variable was perceived negative affect, which was assessed in Experiment 1 by asking participants to what extent they were in a hostile mood (1 – very weak, 7 – very strong). This dependent variable was measured because pilot testing³ had indicated that this variable was best suited to serve as dependent variable in the mediation analyses of Experiment 1. To check for the manipulation of outcome, participants were

²The 7 items of Heatherton and Polivy's (1991) social state self-esteem subscale and the 6 items of these authors' performance state self-esteem subscale were tested in the pilot studies.

³Eleven negative affect items were tested in the pilot studies.

asked to what extent they agreed with the statement that they received an equal number of tickets as Other (1 – strongly disagree; 7 – strongly agree), and to what extent they agreed with the statement that they received less lottery tickets than did Other (1 – strongly disagree; 7 – strongly agree). (Following previous work on terror management (e.g., Arndt *et al.*, 1999; Greenberg *et al.*, 1990; Harmon-Jones *et al.*, 1997; McGregor *et al.*, 1998), the manipulation of mortality salience was not explicitly checked, but debriefing interviews indicated that this manipulation was induced as intended. Furthermore, results to be presented later show that this manipulation had well-intended effects on the dependent variable.) Finally, to further validate the manipulation of outcome, participants' outcome fairness judgments were solicited by asking participants how fair (1 – very unfair, 7 – very fair) and justified (1 – very unjustified, 7 – very justified) they considered their three lottery tickets. When the participants had answered these questions, they were thoroughly debriefed and paid for their participation.

Results

Manipulation Checks

A two-way multivariate analysis of variance (MANOVA) on the two manipulation checks of outcome (the equal-to-other check and the worse-than-other check) yielded only a main effect of outcome at both the multivariate level and the univariate levels: multivariate $F(2, 111) = 303.68, p < 0.001$; for the equal-to-other check, $F(1, 112) = 491.51, p < 0.001$; for the worse-than-other check, $F(1, 112) = 501.92, p < 0.001$. Participants in the equal-to-other condition agreed more with the statement that their number of lottery tickets equaled the number of Other's tickets ($M = 6.5, SD = 1.0$) than did participants in the worse-than-other condition ($M = 1.6, SD = 1.4$). Participants in the worse-than-other condition agreed more with the statement that they received less lottery tickets than Other ($M = 6.2, SD = 1.6$) compared to participants in the equal-to-other condition ($M = 1.2, SD = 0.5$). This indicates that outcome was successfully operationalized.

Similarly, participants' outcome fairness judgments (outcome fairness and justification) yielded only a main effect of outcome at both the multivariate level and the univariate levels: multivariate $F(2, 111) = 60.19, p < 0.001$; for outcome fairness judgments, $F(1, 112) = 120.60, p < 0.001$; for outcome justification judgments, $F(1, 112) = 90.96, p < 0.001$. As expected, participants who had received an outcome that was equal to Other judged their outcome to be more fair ($M = 5.5, SD = 1.4$) and justified ($M = 5.3, SD = 1.3$) than participants who received an outcome that was worse than Other ($M_s = 2.6$ and $2.9, SD_s = 1.4$ and 1.4 , respectively). This yields corroborative evidence that the manipulation of outcome was perceived as intended.

PANAS Findings

In most terror management studies, a version of the PANAS schedules is administered immediately following the mortality salient manipulation—serving primarily as a filler task—and typically no effects of mortality salience on the positive and negative subsets are found. I checked whether mortality salience did not affect the positive and negative subsets in Experiment 1: As expected, both the PA and NA scales yielded no significant effects at both the multivariate level and the univariate levels. This shows that, in correspondence with previous terror management studies, mortality salience had no effect on the PA scale ($M = 2.8$, $SD = 0.7$) and the NA scale ($M = 1.4$, $SD = 0.5$), and that, as expected, outcome did not affect the PANAS scales (which were assessed before outcome was manipulated).

Comparability Measures

As expected, participants' comparability judgments yielded no significant effects at the multivariate level. Contrary to what was expected, however, one univariate effect was statistically significant: Participants in the worse-than-other condition indicated that Other had performed slightly better ($M = 4.1$, $SD = 0.2$) than participants in the equal-to-other condition ($M = 3.9$, $SD = 0.3$), $F(1, 112) = 4.62$, $p < 0.05$. However, both means did not differ from the midpoint of the scale. Furthermore, univariate analyses on the question to what extent Other was good in performing the tasks did not yield any effects: Participants indicated that Other was equally good in performing the tasks ($M = 4.0$, $SD = 0.2$). It seems reasonable to conclude that—in correspondence with previous work (Van den Bos, 1999; Van den Bos *et al.*, 1997a, 1998a,b; Van den Bos and Miedema, 2000)—participants thought of the other person as a comparable person with respect to the tasks that were completed in the experiment.

State Self-Esteem Items

Participants' answers to the state self-esteem questions were measured after the mortality salience manipulation and before the outcome manipulation had been induced to determine whether mortality salience had an effect on participants' state self-esteem. It was therefore checked whether mortality salience had an effect on participants' answers on the self-esteem questions. Results showed this was the case: As expected, a multivariate main effect of mortality salience on participants' answers on the two questions was found, $F(2, 113) = 3.65$, $p < 0.03$. Furthermore, participants' reactions to the statement "At this moment, I worry about my performance" yielded a significant univariate effect of mortality salience, $F(1, 114) = 6.79$, $p < 0.02$. This shows that participants in the mortality salient

Table I. Means and Standard Deviations of Ratings of Negative Affect as a Function of Mortality Salience and Outcome (Experiment 1)

Outcome	Mortality salience	
	Salient	Nonsalient
Equal to other	1.5 (1.0)	2.1 (1.5)
Worse than other	2.7 (1.5)	2.2 (1.5)

Note. Values are $M(SD)$ values. Means are on 7-point scales, with higher values indicating higher ratings of negative affect.

condition ($M = 2.0$, $SD = 1.1$) were more worried than participants in the nonsalient condition ($M = 1.5$, $SD = 0.8$). The statement “At this moment, I feel as smart as others” showed a marginally significant effect of mortality salience, $F(1, 114) = 2.97$, $p < 0.09$, suggesting that participants in the mortality salient condition ($M = 3.4$, $SD = 1.0$) felt somewhat less smart than did participants in the nonsalient condition ($M = 3.7$, $SD = 0.9$).

Dependent Variable

Main dependent variable was negative affect after both mortality salience and outcome had been induced. Table I shows the means and standard deviations. As expected, participants’ ratings yielded only a main effect of outcome, $F(1, 112) = 5.98$, $p < 0.02$, and an interaction effect, $F(1, 112) = 4.20$, $p < 0.05$. The main effect of outcome indicated that participants’ ratings were more negative when their outcome was worse than Other’s outcome as opposed to equal to Other’s outcome. More interesting, the interaction effect showed that, as predicted, the effect of outcome was stronger in the mortality salient condition, $F(1, 112) = 10.11$, $p < 0.01$, than in the nonsalient condition, $F < 1$.

Additionally, it can be noted that the effects of mortality salience were not statistically significant within the equal-to-other outcome conditions, $F(1, 112) = 2.53$, ns, and the worse-than-other outcome conditions, $F(1, 112) = 1.71$, ns. I will come back to this in the General Discussion.

Mediation Analysis

Before mediation is indicated three conditions must hold (Baron and Kenny, 1986). First, independent variables should affect the dependent variable. As mentioned earlier, the predicted interaction between mortality salience and outcome was indeed found on the dependent variable, showing that, as hypothesized, mortality salience moderated participants’ reactions to variations in distributive fairness. Second, the hypothesized mediator should be affected by the independent variables. We have seen that, as intended, mortality salience indeed affected participants’ answers on the self-esteem items, although one item was more strongly affected than

the other item. The third step in the mediation analysis is to show that the relationship between the independent and dependent variables is weaker after controlling for mediator variables. To test this, a two-way analysis of covariance (ANCOVA) was conducted on the dependent variable with the self-esteem items serving as covariates.⁴ In line with predictions, the main effect of outcome was still significant, $F(1, 110) = 5.83, p < 0.02$, whereas the mortality salience \times outcome interaction was not statistically significant in this analysis, $F(1, 110) = 3.83, ns$. This provides suggestive evidence that self-esteem may mediate the effects of mortality salience on participants' reactions to variations in distributive fairness.

Discussion

As expected, it was found in Experiment 1 that people's ratings of negative affect are more strongly affected by variations in fairness (viz. outcomes that are equal to as opposed to worse than outcomes of comparison others) when people have been thinking about mortality than when they have not been thinking about this subject. These are important findings because they are the first to show the moderating effects of mortality salience on a distributive fairness manipulation. Furthermore, suggestive evidence was found that state self-esteem is lower in mortality salient as opposed to nonsalient conditions and that state self-esteem may mediate the effects of mortality salience on people's reactions to perceived fairness. This may indicate that supportive evidence has been found for terror management's self-esteem mechanism. Before strong conclusions on the basis of these results were drawn, however, a second experiment was conducted.

EXPERIMENT 2

The self-esteem mechanism of terror management theory proposes that reminding people of their death increases the need to recover positive levels of self-esteem. In correspondence with this mechanism, results by Ben-Ari *et al.* (1999, Study 4) indicate that after reminders of death people are in need of a boost in their self-esteem. It was decided to follow up the Ben-Ari *et al.* study in Experiment 2. That is, it was reasoned in Experiment 2 that if an activity would be introduced (after reminders of mortality and before the fairness manipulation had been induced) with which participants could reaffirm their conceptions of themselves this should lead to less strong effects of mortality salience on participants' reactions to subsequent variations in fairness than if such a self-affirmation activity would not be introduced. It was predicted, therefore, that the mortality salience \times fairness manipulation effects found in Experiment 1 and in Van den Bos and Miedema (2000) would be weaker in self-affirmation-present conditions than in self-affirmation-absent conditions.

⁴Conducting regression analyses to test for mediation yielded similar results.

In Experiment 2, a manipulation of self-affirmation was used that took a short amount of time: Participants were or were not asked to write down three positive aspects of themselves. To enhance the robustness of the findings reported in this paper and to rule out alternative explanations, some changes were made compared to Experiment 1: Following previous terror management studies (e.g., McGregor *et al.*, 1998), participants in the mortality nonsalient condition were asked to write down their responses to two questions about them taking exams. Because there are a number of fairness manipulations, it was important to show that similar results can emerge across operationalizations. Therefore, the fairness manipulation of Experiment 2 consisted of the most generally accepted and best-documented manipulation in procedural justice experiments: Participants either received or did not receive an opportunity to voice their opinion about a decision (cf. Van den Bos *et al.*, 1997a; Van den Bos and Miedema, 2000, Experiments 1 and 2). Main dependent variables in Experiment 2 were again ratings of negative affect. To get an indication of the reliability with which negative affect was measured, I solicited four negative affect items in Experiment 2: The dependent variable list included the same negative affect item as in Experiment 1 (hostility) and three other negative affect items that were derived from previous justice experiments (anger, furiousness, and sadness; cf. Van den Bos and Miedema, 2000; Van den Bos and Spruijt, in press; Van den Bos and Van Prooijen, in press).

Method

Participants and Design

One hundred and sixty students (53 men and 107 women) at Leiden University participated in the experiment and were paid for their participation. Participants were randomly assigned to one of the conditions of the 2 (self-affirmation: present vs. absent) \times 2 (mortality salience: salient vs. nonsalient) \times 2 (procedure: voice vs. no voice) factorial design. A minimum of 18 and a maximum of 22 participants took part in each of the eight conditions.

Experimental Procedure

The experimental procedure was the same as in Experiment 1, except for the points mentioned earlier. Participants participated in the experiment and answered the questions that constituted the dependent variables and the manipulation checks before participating in two other, unrelated studies. The studies lasted a total of 105 min, and participants were paid 17.50 Dutch guilders for their participation.

The mortality *salient* condition was induced in the same way as in Experiment 1. Following previous terror management experiments (e.g., Harmon-Jones *et al.*, 1997), participants in the *nonsalient* condition of Experiment 2 were asked to write down on a piece of paper next to the computer their answers to the questions

(1) "Please briefly describe the emotions that the thought of you taking exams arouses in you," and (2) "Please write down, as specifically as you can, what you think will happen to you as you take exams." After the mortality salience manipulation, participants answered the PANAS. The positive and negative subsets of the PANAS yielded reliable scales (α s = 0.83 and 0.80, respectively). After this, self-affirmation was manipulated. Participants in the self-affirmation-*present* condition were asked to write down three positive aspects of themselves on a new piece of paper. Participants in the self-affirmation-*absent* condition were not asked this.

The procedure was then manipulated. In the *voice* condition, the experimenter allegedly asked participants, by means of the computer network, to type in their opinion about the percentage of tickets that they should receive relative to Other. Participants in the *no-voice* condition were informed that they would not be asked to type their opinion about the percentage of tickets that they should receive relative to Other. (In reality, however, all stimulus information was preprogrammed; an experimental procedure to which none of the participants objected upon debriefing.)

After this, participants were asked questions pertaining to the dependent variables and manipulation checks. Following previous fairness experiments (e.g., Van den Bos and Miedema, 2000; Van den Bos and Spruijt, in press; Van den Bos and Van Prooijen, in press), main dependent variables were ratings of negative affect, which were assessed in Experiment 2 by asking participants how hostile (1 – not at all hostile, 7 – very hostile), angry (1 – not at all angry, 7 – very angry), furious (1 – not at all furious, 7 – very furious), and sad (1 – not at all sad, 7 – very sad) they felt about the way they were treated. These dependent variables were averaged to form a reliable scale of negative affect ($\alpha = 0.90$).

Following previous fairness studies, the manipulation of procedure was checked by asking participants to what extent they agreed with the statement that they had been given an opportunity to voice their opinion about the percentage of tickets that they should receive relative to Other (1 – strongly disagree, 7 – strongly agree) and to what extent they agreed with the statement that they had *not* been given an opportunity to voice their opinion about the percentage of tickets that they should receive relative to Other (1 – strongly disagree, 7 – strongly agree). (Following previous work on self-affirmation (e.g., Liu and Steele, 1986; Steele and Liu, 1983; Wiesenfeld *et al.*, 1999) and terror management (e.g., Arndt *et al.*, 1999; Greenberg *et al.*, 1990; Harmon-Jones *et al.*, 1997; McGregor *et al.*, 1998), the manipulations of self-affirmation and mortality salience were not explicitly checked, but debriefing interviews indicated that these manipulations were induced as intended. Furthermore, results to be presented below show that these manipulations had well-intended effects on the dependent variables.) Finally, to further validate the manipulation of procedure, participants' procedural fairness judgments were solicited by asking participants how fair (1 – very unfair, 7 – very fair) and justified (1 – very unjustified, 7 – very justified) they considered the way in which they had been treated. When the participants had answered these questions,

and had completed the other experiments in which they would participate, they were thoroughly debriefed and paid for their participation.

Results

Manipulation Checks

A three-way MANOVA on the two manipulation checks of procedure (the voice check and the no-voice check) yielded only a main effect of procedure at both the multivariate level and the univariate levels: multivariate $F(2, 151) = 226.90$, $p < 0.001$; for the voice check, $F(1, 152) = 432.71$, $p < 0.001$; for the no-voice check, $F(1, 152) = 310.76$, $p < 0.001$. Inspection of the means indicated that participants in the voice condition agreed more with the statement that they received an opportunity to voice their opinion ($M = 6.0$, $SD = 1.5$) than did participants in the no-voice condition ($M = 1.5$, $SD = 1.2$). Participants in the no-voice condition agreed more with the statement that they did *not* receive an opportunity to voice their opinion ($M = 6.2$, $SD = 1.6$) than did participants in the voice condition ($M = 1.9$, $SD = 1.5$). This suggests that procedure was successfully operationalized.

Similarly, participants' procedural fairness judgments (procedural fairness and justification) yielded only a main effect of procedure at both the multivariate level and the univariate levels: multivariate $F(2, 151) = 97.70$, $p < 0.001$; for procedural fairness judgments, $F(1, 152) = 170.24$, $p < 0.001$; for procedural justification judgments, $F(1, 152) = 162.35$, $p < 0.001$. As expected, participants who had received an opportunity to voice their opinion judged the procedure to be more fair ($M = 5.4$, $SD = 1.6$) and more justified ($M = 5.3$, $SD = 1.4$) than participants who did not receive such an opportunity (M s = 2.4 and 2.5, SD s = 1.3 and 1.4, respectively). This yields additional evidence that the manipulation of procedure was perceived as intended.

PANAS Findings

As expected, a three-way MANOVA on the PANAS scales yielded no significant effects at both the multivariate level and the univariate levels. This shows that, as expected, mortality salience (as well as self-affirmation and procedure—which were not induced at the moment the PANAS was administered) had no effects on the PA scale ($M = 3.0$, $SD = 0.6$) and the NA scale ($M = 1.4$, $SD = 0.4$).

Comparability Measures

As expected, participants' comparability judgments yielded no significant effects at both the multivariate level and the univariate levels. Participants indicated

that the other participant had performed equally well in the work round ($M = 4.0$, $SD = 0.3$), and was equally good in performing the tasks ($M = 4.0$, $SD = 0.2$). Thus, participants thought of the other person as a comparable person with respect to the tasks that were completed in the experiment.

Percentage Findings

Participants who were allowed voice ($n = 80$) typed in their opinion about the percentage tickets that they should receive relative to the other participant. A 2 (self-affirmation) \times 2 (mortality salience) analysis of variance (ANOVA) yielded no significant effects. Inspection of the means indicated that participants typed in that the lottery tickets should be divided equally between themselves and the other participant: Seventy-three of the participants answered that they should get 50% of the tickets, and the mean percentage was 50.2% ($SD = 8.7$). These findings are supportive of equity theory: Participants preferred to divide outcomes equally between themselves and the other participant (who contributed an equal amount of inputs, and who hence deserved, according to equity theory, to receive the same amount of outputs as the participants themselves).

Dependent Variables

Main dependent variables were participants' ratings of negative affect after all independent variables had been induced. The means and standard deviations of the negative affect scale are displayed in Table II. A three-way ANOVA on the negative affect scale yielded only a main effect of procedure, $F(1, 152) = 48.28$, $p < 0.001$, a main effect of self-affirmation, $F(1, 152) = 4.15$, $p < 0.05$, and an interaction between self-affirmation, mortality salience, and procedure, $F(1, 152) = 5.01$, $p < 0.03$. The main effect of procedure indicated that participants' ratings of affect were less negative when they received an opportunity to voice their opinion than when they did not receive such an opportunity. The main effect of self-affirmation showed that participants affect ratings were less negative when they had written down positive aspects of themselves than when they had not

Table II. Means and Standard Deviations of Ratings of Negative Affect as a Function of Self-Affirmation, Mortality Salience, and Procedure (Experiment 2)

Procedure	Self-affirmation absent		Self-affirmation present	
	Mortality salient	Mortality nonsalient	Mortality salient	Mortality nonsalient
Voice	1.6 (0.8)	2.1 (1.3)	1.6 (0.8)	1.4 (0.8)
No voice	3.5 (1.1)	2.9 (1.4)	2.6 (1.2)	3.0 (1.5)

Note. Values are $M(SD)$ values. Means are on 7-point scales, with higher values indicating higher ratings of negative affect.

done this. More interesting, the three-way interaction effect qualified these effects. To interpret whether this interaction effect provided corroborative evidence for the hypothesis of Experiment 2, 2 (mortality salience) \times 2 (procedure) ANOVAs were conducted within the two self-affirmation conditions.

As predicted, within the self-affirmation-*absent* condition only a main effect of procedure, $F(1, 152) = 25.28, p < 0.001$, and an interaction between mortality salience and procedure, $F(1, 152) = 3.96, p < 0.05$, was found. The main effect of procedure indicated that participants' affect ratings were less negative when they received voice than when they received no voice. More important, however, the interaction effect shows that this procedure effect was stronger in the mortality salient condition, $F(1, 152) = 27.37, p < 0.001, \eta^2 = 0.15$, than in the nonsalient condition, $F(1, 152) = 4.19, p < 0.05, \eta^2 = 0.03$. In further correspondence with my predictions, within the self-affirmation-*present* condition only a main effect of procedure was found, $F(1, 152) = 23.02, p < 0.001$ (other F s $< 1.39, p$ s > 0.24), indicating that participants' ratings of affect were less negative when they had received voice as opposed to no voice.

As an aside, it can be noted here that within the self-affirmation-*absent* conditions, mortality salience had a significant effect on the negative affect scale within the *no-voice* conditions, $F(1, 152) = 4.26, p < 0.05$, and was not statistically significant within the voice conditions, $F(1, 152) = 2.21, ns$. (As expected, within the self-affirmation-*present* conditions, mortality salience had no significant effects within both procedure conditions.) I will return to this in the General Discussion.

Discussion

The findings of Experiment 2 support terror management theory's predictions: As expected, within the self-affirmation-*absent* conditions it was found that people's ratings of negative affect are more strongly influenced by variations in fairness (viz. voice vs. no-voice procedures) when they have been thinking about mortality than when they have not been thinking about this subject. Furthermore, as hypothesized, this mortality salience \times procedure effect was less strong within the self-affirmation-*present* conditions. In fact, this latter interaction effect was statistically not significant, providing strong evidence for the predictions derived from terror management theory.

GENERAL DISCUSSION

The findings of both experiments presented here show that reminders of death lead to stronger effects of perceived fairness on ratings of negative affect. Furthermore, this effect of mortality salience can be found on people's reactions toward both procedural fairness (Experiment 2) and distributive fairness (Experiment 1).

The self-esteem mechanism of terror management theory proposes that reminding people of their death increases the need to recover positive levels of self-esteem. In correspondence with this mechanism, Experiment 2 suggests that after reminders of death people are in need for a boost in their self-esteem. That is, Experiment 2 shows that introducing an activity (after reminders of mortality and before the fairness manipulation had been induced) with which people can reaffirm their conceptions of themselves leads to less strong effects of mortality salience on people's reactions to subsequent variations in fairness than not introducing such a self-affirmation activity. Experiment 1 also supported the self-esteem mechanism in that suggestive evidence was found that state self-esteem is lower in mortality salient as opposed to nonsalient conditions and that state self-esteem may mediate the effects of mortality salience on people's reactions to perceived fairness.

It should be noted here that results of Experiment 1 were less strong than the findings of Experiment 2. This may have to do with the measurement of self-esteem in Experiment 1. After all, previous terror management studies showed no strong indications that people report reductions in *explicit* self-esteem after being verbally reminded of death (Greenberg *et al.*, 1992). Experiment 1 suggested that reminders of death can lower explicit self-esteem, but—in correspondence with previous terror management studies (see Greenberg *et al.*, 1992)—the effects of Experiment 1 were not very strong. Future research might want to use *implicit* measures of self-esteem (as Koole *et al.*, 2000, did). It should be emphasized here, however, that pilot studies showed that assessment of all 26 letters of the alphabet (cf. Koole *et al.*, 2000) would take too long. More important, researchers have not yet converged on how to assess implicit self-esteem (Greenwald and Banaji, 1995). This suggests that conceptual questions can be raised as to how to measure implicit self-esteem in a valid way. All in all, future research exploring the effects of reminders of death on implicit and explicit self-esteem clearly is needed. When we take the findings of Experiments 1 and 2 together, however, it seems reasonable to suggest that after reminders of death people are in need for a boost in their self-esteem and that this affects how they react to perceived fairness.

It is also important to point out here that in Experiment 1 the main effect of outcome remained significant when self-esteem was controlled statistically and that in Experiment 2 the main effect of procedure was significant within the self-affirmation absent condition. This suggests that, presumably, the effect of fairness manipulations (outcome and procedure) on negative affect are mediated in part via some other mechanism(s) than self-esteem (as indeed has been demonstrated in past research), and that the latter mechanism becomes particularly salient under conditions of mortality salience (cf. the current paper) and/or uncertainty salience (cf. Van den Bos, 2001).⁵ Future research is needed to investigate these issues.

⁵I thank an anonymous reviewer for pointing this out.

A close inspection of the findings reported in the current paper shows that in Experiment 2 significant effects of mortality salience were found on participants' affect ratings within the *unfair* conditions and not within the fair conditions. In Experiment 1, effects of mortality salience did not reach conventional levels of significance within both the fair and unfair conditions ($0.11 < ps < 0.20$). These differential findings may have been caused, among other things, by the difference in psychological impact of the different fairness manipulations of Experiments 1 versus 2. Future research may want to find out when fairness versus unfairness affects people's reactions stronger as a function of mortality salience. However, it should be noted here that the Van den Bos and Miedema (2000) findings are in agreement with the present findings. That is, in two out of three experiments of the Van den Bos and Miedema paper significant effects of mortality salience were found within the *unfair* conditions, and not within the fair conditions.

Thus, the findings of both Van den Bos and Miedema (2000) and the current paper suggest that mortality salience tends to affect people's reactions to unfair events stronger than reactions to fair events. Perhaps these findings are related to notions ventilated by several authors (e.g., Folger, 1984; Folger and Cropanzano, 1998; see also Brockner and Wiesenfeld, 1996; Van den Bos *et al.*, 1997b; Van den Bos and Van Prooijen, in press) that—although they can be affected by fair events, of course—people tend to be more strongly affected by unfair events than by fair events. Perhaps, this also explains why Van den Bos and Miedema found stronger effects on ratings of negative as opposed to positive affect (leading me to choose negative affect as the main dependent variable in the experiments reported here). All these suggestions may imply that people's reactions to perceived fairness may be more strongly affected in negative than in positive domains of human life. Future research may want to explore these important implications.

It should be emphasized here that there is evidence in the research literature that high self-esteem persons are more affected by their perceived level of voice than low self-esteem persons are (Brockner *et al.*, 1998). Most pertinent for the present purposes, the fifth study in the Brockner *et al.* paper consisted of an experimental design in which procedure (voice vs. no voice) and participants' beliefs about their capability to provide meaningful input (higher vs. lower) were orthogonally manipulated. Results showed that procedure had a greater impact on the satisfaction level of participants who had been led to believe that they were more capable of providing meaningful input. In contrast with this, Vermunt *et al.* (in press) found that procedural fairness information was more strongly related to the reactions of low as opposed to high self-esteem respondents. These differential findings may have been caused by different operationalizations of self-esteem and fairness (for details, see Brockner *et al.*, 1998; Vermunt *et al.*, in press). Future research may want to explore the role of different operationalizations of the concepts investigated in the Brockner *et al.* paper, the Vermunt *et al.* paper, and the current paper.

Future research on self-esteem and fairness may also want to focus on the effects that perceived fairness may have on people's self-esteem. After all, some studies have shown that the experience of fair events can lead to higher levels of state self-esteem than the experience of unfair events (Koper *et al.*, 1993). Focusing on self-esteem as both a moderator variable of people's reactions to perceived fairness (cf. Brockner *et al.*, 1998; Vermunt *et al.*, in press; the current paper) and an effect variable of the experience of fairness (cf. Koper *et al.*, 1993) ultimately may contribute to a more refined analysis of the relationship between self-esteem and perceived fairness. The Koper *et al.* findings also are important because they suggest that perceived fairness is not only related to people's cultural norms and values (Lind and Tyler, 1988; Van den Bos and Miedema, 2000), but also affects people's self-esteem. In other words, the experience of fair or unfair events after reminders of death may not only be related to terror management's cultural worldview mechanism (as Van den Bos and Miedema, 2000, suggested) but also to the theory's self-esteem mechanism. Thus, because fairness may be related to both mechanisms, investigating how people react to fair or unfair events after reminders of mortality may be of special importance for terror management theory. It is my hope that the current paper will stimulate future researchers to further explore these exciting issues. This may help scientists in their progress toward understanding the psychology of people's reactions to perceived fairness.

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