



Terror management: the effects of mortality salience and locus of control on risk-taking behaviors

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Abstract

Two studies examined the effects of mortality salience and locus of control on risk-taking. Participants indicated how likely they would be to engage in a variety of risky behaviors, e.g. driving under the influence of alcohol. The results indicated that mortality salience increased the actual risk-taking and the assessed level of risk of individuals with an external locus of control. Individuals with an internal locus of control showed decreased risk-taking and increased risk assessment in the mortality salience condition. In assessing the risk to others, mortality salience reduced the assessed level of risk for individuals with an external locus of control and increased the assessed level of risk for individuals with an internal locus of control. © 2002 Published by Elsevier Science Ltd.

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Why do people sometimes engage in risk-taking behaviors that may be self-destructive? According to past research, individuals will engage in risk-taking behaviors when the possibility of a negative outcome is perceived to be minimal or the potential gain is perceived to be great (Baumeister & Scher, 1988). One of the potential gains for people who engage in risk-taking behaviors is the enhancement of their self-esteem. In a study by Ben-Ari, Florian, and Mikulincer (1999) reckless driving increased significantly when participants were reminded of their own mortality, and driving was relevant to the participant's self esteem. According to terror management theory (Pyszczynski, Greenberg, & Solomon, 1998) self-esteem is enhanced when people live up to the standards provided by their cultural worldview. Thus, individuals with a sense of control over their destiny and fate may engage in risky behaviors if those behaviors are likely to lead to heightened self-esteem and to avoid such behaviors if their self-esteem is not likely to be enhanced.

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1. Terror management theory

Terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986; Solomon, Greenberg, & Pyszczynski, 1991) suggests that the most basic of all human motivations is self-preservation and the instinctive desire for continued life. TMT also suggests that individuals seldom spontaneously think about death because of a deeply rooted fear of death inherent in the human condition. Thus, when people are made aware of their own mortality (mortality salience), anxiety and terror produce a response that the individual expects will lead to self-preservation. To do this, individuals may distort information to suggest that they are invulnerable to illness or accident, find ways to suppress thoughts of death, or activate what Greenberg, Pyszczynski, Solomon, Pinel, Simon, and Jordan (1993) refer to as the cultural anxiety buffer that consists of a cultural worldview and self-esteem.

According to Rosenblatt, Greenberg, Solomon, Pyszczynski, and Lyon (1989), a cultural worldview is a shared reality that is individualized according to one's perceptions and thoughts about the world that surrounds them. The worldview provides an explanation for our existence and a set of standards for what is valuable. Becker (1973) defined a cultural worldview as an unconscious combination of our parent's beliefs, our social groups, and the symbols of our society and nation. This combination leads to an unconscious internalized structure of one's cultural beliefs and values. In this way cultural worldviews are used as guidelines by which individuals direct their own behaviors.

Pyszczynski et al. (1998) suggest that one's cultural worldview bestows the illusion of control over death by promising immortality for those persons who live up to the prescribed standards through (1) the sense of belonging to a longer-lasting higher power or (2) through the enhancement of self-esteem—the promise of being a valued member within one's worldview.

Previous research has demonstrated that when individuals are induced to think about their own death (mortality salience) they evaluate those persons who validate their view of the world more favorably than those persons whose worldview differs from theirs (Greenberg, Pyszczynski, Solomon, Rosenblatt, Mitchell-Veeder, & Lyon, 1990), uphold their worldview's values and beliefs (Pyszczynski, Greenberg, & Solomon, 1997), have higher level of patriotism for their nation over other nations (Nelson, Moore, Olivetti, & Scott, 1997), have decreased aggression towards others with similar worldviews and increased aggression towards those with different worldviews (McGregor et al., 1998), put greater stress on those who do not validate their worldview (Greenberg, Porteus, Simon, & Pyszczynski, 1995), and, most importantly for this research, increase their level of risk-taking if risk-taking is an essential component of their self-esteem (Ben-Ari et al., 1999).

2. Locus of control

Another factor that has been shown to affect risk-taking behavior is locus of control. Locus of control is a personality attribute reflecting the degree to which one generally perceives events to be under their control (internal locus) or under the control of powerful others or other outside forces (external locus; Rotter, 1966).

Several studies reported that individuals with an internal locus of control are more likely to take greater risks. Gore and Rotter (1963) found that internals wanted social change to come from actions such as the March on Washington and from forming groups like the Freedom

Riders, which would suggest a greater preference for risk since these civil rights activities were often a catalyst for violence. Externals expressed very little to no willingness or interest in participating in such risky activities such as rallies. Higbee (1972), in a study of military decision making, found that individuals who felt they were in control tended to make more risky decisions. Similarly, Horswill and McKenna (1999) found that automobile drivers (individuals in control) were comfortable with a higher level of risk than were passengers (individuals not in control). In a study by Klonowicz and Sokolowska (1993) where the risk was related to industrial accidents, internals displayed less safety behavior than did externals.

Conversely, Salminen and Klen (1994) found that both forestry workers and construction workers with an external locus of control tended to take more risks. Additional studies that found a positive relation between external locus of control and risk-taking include Terry, Galligan, and Conway (1993), who studied safe-sex practices, and DuCette and Wolk (1972) who examined extreme behaviors related to risk taking preferences in academic, occupational, and cognitive activities. Janicak (1996) found that measuring locus of control and the level of job hazards could predict the extent to which workers engaged in risky behaviors. Internals chose less risk in the working environment than did externals. Internals who feel they have control do not suffer as much from outside stresses as externals, as measured by the Hopkins Symptoms Checklist (DeBrabander, Helleman, Boone, & Gerits, 1996).

There is some evidence that the nature of the risk can affect the extent to which internals or externals are greater risk takers. For example, Cohen, Sheposh, and Hillix (1979) found that internals took more risks on a skill task whereas externals took greater risks on a chance task. Internals were more likely to believe that what happened to them was a result of their own skill while externals were more likely to believe that it was chance that played the greater role in what happened to them.

It would seem that this differing belief in chance versus skill has many of the characteristics of a worldview; it provides an explanation for what happens to us, sets standards for our behavior, and is implicated in how we acquire a sense of self-worth. If mortality salience leads us to seek ways to more closely embrace our worldview (Greenberg, Arndt, Schimel, Pyszczynski, & Solomon, 2001), then it may be that internals reminded of their own death will see the world as a place in which personal control thrives, whereas externals reminded of their death may see the world as even more chancy. The purpose of the present research was to examine what effect locus of control has on the risk-taking of individuals, especially those persons who are reminded of their own mortality.

3. Study 1

Study 1 examined the effects of locus of control and mortality salience on risk-taking behavior. Because the types of risks examined in this study provided the participant with choice, we hypothesized that participants with an internal locus of control would engage in riskier behaviors than participants with an external locus of control. Mortality salience is expected to influence internals and externals differently. It was hypothesized that internals, who are reminded of their mortality, would see potentially dangerous situations as more risky and, given their tendency for control, would exercise their choice to avoid such situations. Internals reminded of their own mortality should experience dissonance between the belief that one is in control of their life and the reminder that one does not control their death. Alternatively, externals who are reminded of their

mortality may, because they see their fate as controlled by external factors, take greater risks assuming that their choices are not relevant to the potentially dangerous outcomes.

4. Method

4.1. Participants

The participants were 94 undergraduate students (29 men, 65 women) with a mean age of 20.0 enrolled in introductory psychology classes at the University of Nebraska at Kearney. The students received extra credit points for participating.

4.2. Design

The design was a 2 (mortality salience) \times 2 (locus of control) between subjects factorial. Mortality salience consisted of the presence or absence of the mortality salience induction. Rotter's I-E locus of control survey was used to determine whether an individual had an internal or external center of control.

4.3. Materials

4.3.1. Locus of control survey

Locus of control was assessed using Rotter's (1966) 23-item Locus of Control Scale. This scale uses a forced-choice format and has been employed in over 50% of the internal—external locus of control studies. An internal consistency coefficient of .70 was obtained from a sample of 400 college students (Rotter, 1966). Scores on the scale can range from 0 (most internal) to 23 (most external). Therefore, in this study, participants who scored above the median in our sample (Median = 12) were classified as externals whereas those participants who scored below the median were classified as internals.

4.3.2. Mortality salience treatment

Mortality salience was manipulated with a 15-item true-or-false questionnaire designed to induce thoughts about one's own death (Pyszczynski et al., 1997). The questionnaire included such items as "I often think about how short life really is," and "It doesn't make me nervous when people talk about death." Participants in the control condition responded to a parallel instrument on watching television. This alternative survey also contained 15 true-or-false items designed to stimulate thoughts about something other than death, such as "Time flies very rapidly when I watch television," and "I can watch shopping channels on television for hours."

4.3.3. Perceived engagement in risk-taking

Perceived risk-taking was measured using a set of 15 scenarios each of which described a potentially risky situation and provided a set of behavioral choices for coping with the situation. These choices ranged from very risky to not risky at all. For example, one of the scenarios read as follows: "Midterms are over and its about 3:00 pm. When you walk into your house, two of your

friends are there and they have just bought a 30-pack of beer. By 8:00 pm the thirty pack is gone and one of your friends says, "Let's go to the bar." What do you think you would do?" For this scenario the choices were: (1) You call a sober friend to drive you to the bar, (2) You or one of your friends drives to the bar, (3) You say "No, I have had enough to drink today," (4) You walk to the bar, or (5) You call a cab to take you to the bar. Other scenarios described risky situations involving driving over the speed limit, using drugs, unsafe sex, interpersonal violence, and other potentially dangerous situations. To create the risk scores, a group of 23 upper level psychology students were provided with the scenarios and behavioral options for coping with the situation described in each scenario. The students were asked to rate each option as to the degree of risk inherent in the behavior using a scale from 1 (least risky) to 7 (most risky). The degree of riskiness for each option was determined by calculating a mean score for each scenario option. This degree of riskiness score associated with each option was used as the risk-taking scores in analyzing the data.

4.4. Procedure

The study was conducted in two sessions during regular class periods. In the first session, all participants were first given the locus of control survey. Participants were then randomly assigned to one of two conditions. Half of the participants received the mortality salience survey and the other half received the television survey. Because mortality salience has a greater effect on worldview defense after a brief delay (Greenberg, Arndt, Simon, Pyszczynski, & Solomon, 2000) the perceived risk-taking survey was distributed 3 min after the mortality salience surveys. In order to match the data from the first to the second sessions, the participants created code names to be used throughout the study.

5. Results and discussion

The individual's risk-taking scores for all 15 scenarios were pooled to create a mean risk score. The participants' perceived engagement in risk was analyzed using a 2 (Mortality Salience) \times 2 (Locus of Control) analysis of variance. There was no significant main effect for mortality salience or locus of control ($F_s < 1.0$, $P_s = \text{ns}$). The interaction between mortality salience and locus of control was significant, $F(1, 92) = 5.2$, $P < 0.025$. Fig. 1 presents these means. For individuals with an external locus of control, there was no significant effect of mortality salience, $F(1, 49) = 1.42$, $P > 0.20$, on their risk-taking. Mortality salience did seem to affect individuals with an internal locus of control. Internally controlled individuals in the mortality salience condition indicated that they would engage in significantly less risk-taking, $F(1, 42) = 5.11$, $P < 0.029$, when compared to internals in the control condition. Internals in the control condition did not differ significantly from externals in risk-taking, $F(1, 49) = 1.36$, $P > 0.20$. However, internals in the mortality salience condition indicated that they would engage in less risk-taking, $F(1, 42) = 3.78$, $P < 0.06$, than externals in the mortality salience condition.

Our hypothesis that mortality salience would lead participants with an internal locus of control to take fewer risks whereas those participants with an external locus of control would take more risks was supported. Internals who were reminded of their mortality exercised control over their environment by choosing less risky options whereas externals under the influence of mortality

salience took more risks. This behavior may reflect a different appraisal by internals and externals of the degree of risk inherent in the “risky situations.” Perhaps internals choose to take fewer risks because they assess the degree of risk as greater. If internal control acts like a worldview, then it would be expected that their choice to take fewer risks would be supported by an assessment of greater riskiness. Alternatively, externals who may see the world as a chancy place and therefore choose to not control the level of risk with safe options, may also assess the risk as less in order to protect themselves from feelings of vulnerability in chancy situations that could lead to death.

6. Study 2

The purpose of Study 2 was to examine the effects of mortality salience and locus of control on risk assessment. It was hypothesized that internals whose mortality is made salient will assess the level of risk as higher than internals who have not been reminded of their mortality. Internals reminded of their own mortality should experience dissonance between the belief that persons are in control of their life and the reminder that people do not control their death. Alternatively, externals who are reminded of their mortality are expected to assess the level of risk in dangerous situations as greater because they believe that outside factors can control their life, and under conditions of mortality salience, their death as well.

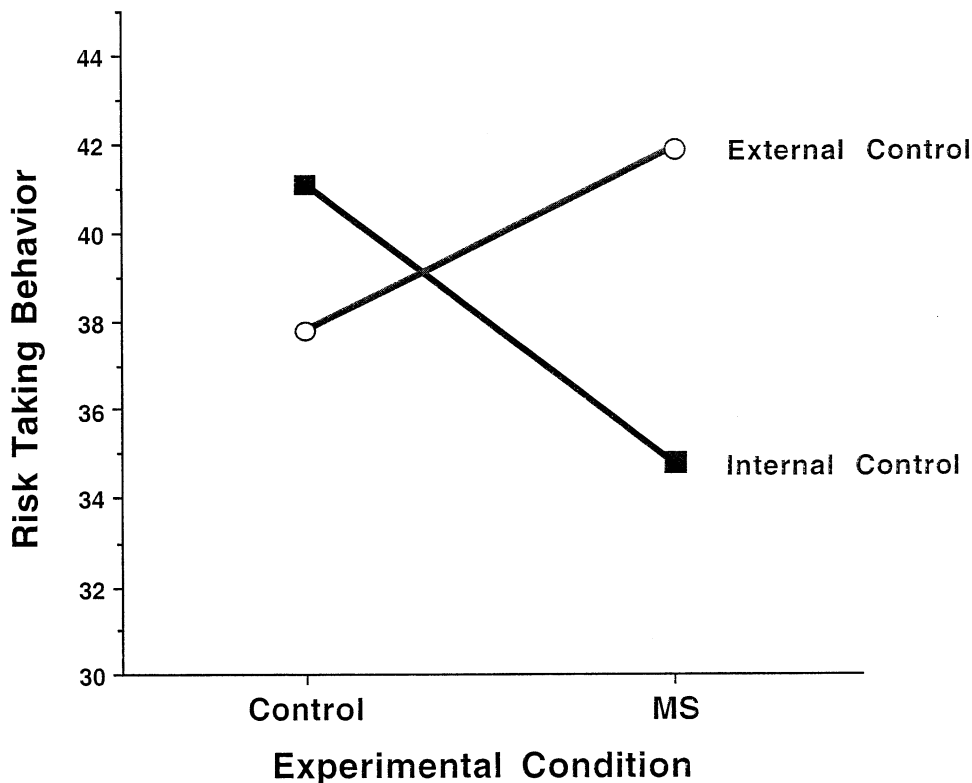


Fig. 1. The effects of locus of control and mortality salience on mean rating of preferred risk-taking behavior—Study 1.

In order to test whether or not locus of control is a worldview from the terror management perspective, the assessment of risk for others who engage in risk-taking behaviors was also examined. It was expected that the pattern of risks that internals and externals perceived for themselves would also, to a lesser extent, be perceived for others. It is not clear the extent to which our worldviews extend beyond our beliefs about ourselves. To the extent that our worldview generalizes to others, we expect that mortality salience will lead internals to assess the level of risk for others as higher when compared to the non-mortality salience condition. Externals whose mortality is made salient are expected to assess the level of risk for others as lower when compared to externals in the control group.

7. Method

7.1. Participants

The participants were 65 undergraduate students (24 men, 41 women) with a mean age of 20.0 enrolled in introductory psychology classes at the University of Nebraska at Kearney. The students received extra credit points for participating. None of the students who had participated in Study 1 were included in the sample used in Study 2.

7.2. Design

The design was a 2 (Mortality Salience) \times 2 (Locus of Control) between subjects factorial. Mortality salience consisted of the presence or absence of the mortality salience induction. Rotter's I-E locus of control survey was used to determine whether an individual had an internal or external center of control.

7.3. Materials

The Mortality Salience and Locus of control surveys were identical to those used in Study 1. The risk assessment survey was adapted from Smith and Rosenthal (1995) who identified a variety of ways in which adolescents take risks. The survey consisted of 10 examples of risky behaviors pertinent to college-aged students and ranged from reckless driving to drug use. Participants responded to two questions. The first question was "How much risk of injury or illness would you be in, if you engaged in this activity?" The second question was "How much risk of injury or illness would others be in, if they engaged in this activity?" The questions were answered using a six-point Likert scale (1 = *slight risk*, 6 = *great risk*).

7.4. Procedure

The study was conducted in two sessions during regular class periods. In the first session, all participants were given the locus of control survey. Participants were then randomly assigned to one of two conditions: half of the participants received the mortality salience survey and the other half received the television survey. Because mortality salience has a greater effect after a brief

delay, the risk assessment survey was distributed 3 min after the mortality salience surveys as in Study 1. In order to match the data from the first to the second sessions, the participants created code names used throughout the study.

8. Results

The risk assessment scores for all 10 examples were pooled to create two mean risk scores: one for perceived risk to oneself, and one for perceived risk to others. The correlation between these two scores was $r = 0.67$, $P < 0.01$.

8.1. Assessment of personal risk

The participants' assessment of the extent of risk to themselves was analyzed using a 2 (Mortality Salience) \times 2 (Locus of Control) analysis of variance. A significant main effect for mortality salience was found, $F(1, 65) = 10.90$, $P < 0.001$. Participants in the mortality salience condition rated the extent of risk higher ($M = 5.57$) than did those in the control condition ($M = 4.47$). No significant main effect of Locus of Control was found ($F < 1$, $P = \text{ns}$). The interaction between mortality salience and locus of control was significant, $F(2, 65) = 5.37$, $P < 0.025$. Fig. 2 presents

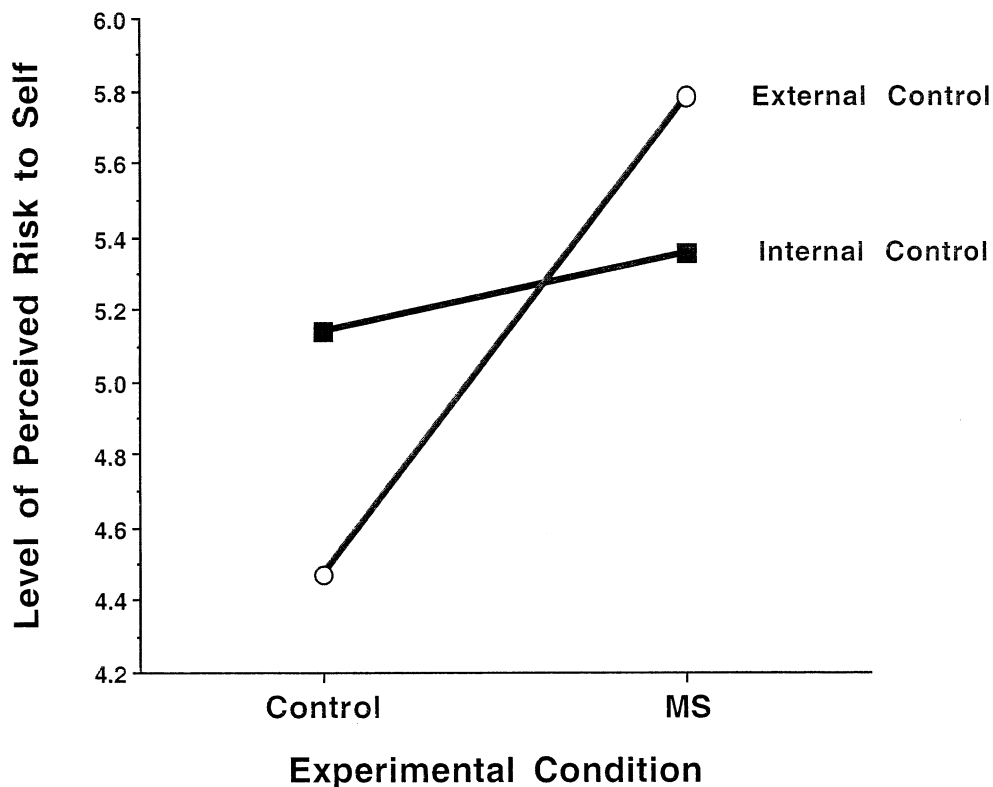


Fig. 2. The effects of locus of control and mortality salience on the mean level of perceived risk to oneself—Study 2.

these means. For individuals with an internal locus of control, there was no significant effect of mortality salience ($F < 1.0$, $P = \text{ns}$) on their assessment of personal risk. Mortality salience did seem to affect individuals with an external locus of control. Externally controlled individuals in the mortality salience condition rated the behaviors as significantly more risky, $F(1, 35) = 21.69$, $P < 0.001$, when compared to externally controlled individuals in the control condition. Externals in the mortality salience condition rated the behaviors as riskier than internals in that condition, $F(1, 32) = 2.73$, $P < 0.10$. Externals in the control condition rated the behaviors as less risky than internals in that condition, $F(1, 32) = 2.82$, $P < 0.10$.

8.2. Assessment of the risk to others

The participants' assessment of the extent of risk to others was analyzed using a 2 (Mortality Salience) \times 2 (Locus of Control) analysis of variance. There were no significant main effects ($F_s < 1.0$, $P_s = \text{ns}$). The interaction between mortality salience and locus of control was significant, $F(2, 65) = 4.65$, $P < 0.05$. Fig. 3 presents these means. Individuals with an external locus of control rated the level of risk to others as less under conditions of mortality salience, $F(1, 35) = 4.49$, $P < 0.05$. Internally controlled individuals rated the level of risk to others as greater under conditions of mortality salience, $F(1, 32) = 4.19$, $P < 0.05$.

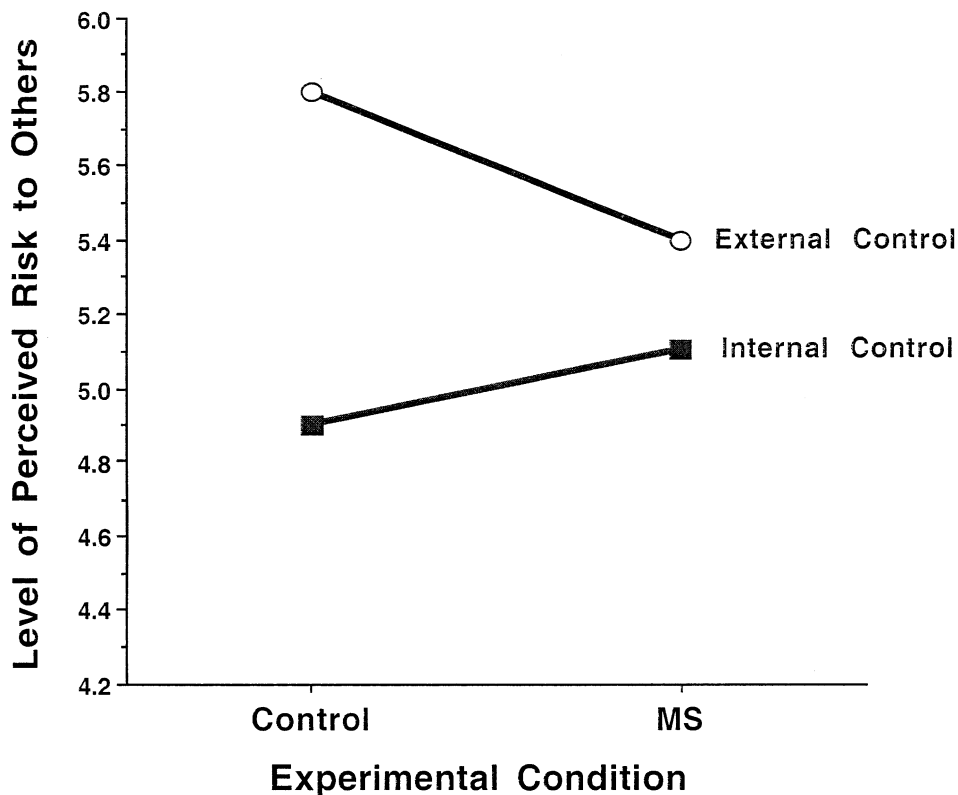


Fig. 3. The effects of locus of control and mortality salience on the mean level of perceived risk to others—Study 2.

For individuals with an internal locus of control, there was no significant effect of mortality salience ($F < 1.0$, P s = ns) on their assessment of personal risk. Mortality salience did seem to affect individuals with an external locus of control. Externally controlled individuals in the mortality salience condition rated the behaviors as significantly more risky, $F(1, 35) = 21.69$, $P < 0.001$, when compared to externally controlled individuals in the control condition. Externals in the mortality salience condition rated the behaviors as riskier than internals in that condition, $F(1, 35) = 2.73$, $P < 0.10$. Externals in the control condition rated the behaviors as less risky than internals in that condition, $F(1, 32) = 2.82$, $P < 0.10$.

9. Discussion

Previous research relating locus of control to risk taking reveals an abundance of conflicting and inconclusive findings. The current study employed a terror management framework, which provides a well-validated theoretical perspective on individuals' behavior that includes a threat to their self-preservation. These studies demonstrate that mortality salience can, as first noted by Ben-Ari et al. (1999), affect behavioral choices that at first glance would seem to contradict the need for self-preservation. Our findings indicate that mortality salience led to riskier choices by individuals with an external locus of control despite their assessment that the choices were extremely risky. Individuals with an internal locus of control behaved quite differently. For internals, mortality salience led to less risky choices consistent with their assessment of the level of risk involved.

Why would externals behave in a manner inconsistent with their perceptions? The answer may lie in the nature of external control where chance and fate rather than choice are the determining factors. Mortality salience leads people to activate an anxiety buffer in order to protect themselves from feelings of vulnerability. One way to reduce death anxiety is to "push the envelope" and return unscathed (Mulligan, Miller, & Widick, 2000). If you believe that what happens to you is outside of your control, then the best protection from death anxiety is to engage in behaviors that you deem to be very dangerous but that leave you unharmed. Consistent with this explanation is the suggestion by Crisp and Barber (1995) that externals associate risk taking with invulnerability.

Another interesting finding has to do with the inconsistency that externals show when assessing risk to themselves and risk to others. To explain this finding, we suggest that locus of control acts like a cultural worldview. According to Pyszczynski et al. (1996), mortality salience leads individuals to conclude that their worldview is widely shared by others. Our findings on perceived risk to oneself compared to perceived risk to others provides an interesting perspective on this consensual validation of one's worldview. Individuals with an internal locus of control showed the same pattern of risk assessment for themselves and for others suggesting consensual validation of their worldview. In contrast, individuals with an external locus of control show a very different pattern when assessing risk to others compared to their assessment of risk to themselves. Perhaps the differences lie in the extent to which internal and external loci of control are consistent with accepted cultural values. In the United States, individualism with its emphasis on personal achievement and individual control over events is much more common than collectivism which suggests that one's fate is often in the hands of others (Hofstede, 1984). Therefore, externals in

the United States may recognize that their worldview is not widely shared. This perception would explain why mortality salience leads externals to assess the riskiness as greater for themselves but less for others—a reversal of their assessment when mortality was not made salient.

Previous research that applied terror management theory to risk-taking investigated reckless driving. The studies reported here used a variety of risky situations including unsafe sex, drug abuse, etc. It should be noted, however, that this research is limited in that the risky behaviors are actually behavioral intentions, and that the assessment of risk is hypothetical and not an assessment of actual risks taken. Nevertheless, the findings in the present research provide an interesting perspective on how the awareness of one's existential condition may affect the psychological processes that influence decision making in risky conditions.

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