Journal of Experimental Psychology: General
2001, Vol. 130, No. 3, 427–435

0096-3445/01/$5.00 DOI: 10.1037//0096-3445.130.3.427

I Am *Not* an Animal: Mortality Salience, Disgust, and the Denial of Human Creatureliness

Jamie L. Goldenberg and Tom Pyszczynski
University of Colorado at Colorado Springs

Jeff Greenberg
University of Arizona

Sheldon Solomon
Brooklyn College

Benjamin Kluck and Robin Cornwell
University of Colorado at Colorado Springs

The present research investigated the need to distinguish humans from animals and tested the hypothesis derived from terror management theory that this need stems in part from existential mortality concerns. Specifically, the authors suggest that being an animal is threatening because it reminds people of their vulnerability to death; therefore, reminding people of their mortality was hypothesized to increase the need to distance from animals. In support, Study 1 revealed that reminders of death led to an increased emotional reaction of disgust to body products and animals. Study 2 showed that compared to a control condition, mortality salience led to greater preference for an essay describing people as distinct from animals; and within the mortality salient condition but not the control condition, the essay emphasizing differences from other animals was preferred to the essay emphasizing similarities. The implications of these results for understanding why humans are so invested in beautifying their bodies and denying creaturely aspects of themselves are discussed.

I am not an animal, I am a human being.
—John Merrick, *The Elephant Man;*
David Lynch, *The Elephant Man*

We humans engage in a wide variety of behaviors that serve, at least in part, to deny or minimize our commonalities with other animals. In our culture, we exercise our bodies to more closely approximate an idealized physique; alter and dress our bodies in the latest fashions; rigorously clean our hair and body so that there is no scent other than that which comes out of a bottle; disguise the animal origin of our food by calling it "beef," "pork," or a "Big Mac"; cook our food and prepare it with fancy sauces and garnishes; go to the bathroom in sanitary and "appropriate" receptacles; refine our manners to be respectable members of society; educate our minds to attain high status jobs and the respect that such social roles confer on us; and celebrate the artistic achievements of others who express themselves creatively by painting on canvas or putting words on paper. However, whether or not we use forks and knives to eat, squelch our inclinations to belch, or otherwise tightly control our bodily activities, humankind is widely recognized to have evolved from the same genetic stock as all other primates and to be closely related to all living things. Why, then, do we engage in so many activities that seem to minimize our connections with other animals?

Ernest Becker (1962, 1973) proposed that we do so because acknowledging that we are animals makes us acutely aware that, like other animals, we are material beings vulnerable to death and decay. As Solomon, Greenberg, and Pyszczynski (1991) put it, "Given such awareness, humans could not function with equanimity if they believed that they were not inherently more significant than apes, lizards, and lima beans" (p. 96). We suggest, therefore, that cultures promote norms that help people to distinguish themselves from animals, because this distinction serves the very important psychological function of providing protection from deeply rooted concerns about mortality. In this article, we report findings from two experiments that provide initial empirical support for this idea that distancing from the rest of the animal kingdom helps humans defend against anxiety associated with the awareness of death.

Terror Management Theory

Terror management theory (e.g., Solomon et al., 1991) is a social psychological theory that extends the analysis developed by Ernest Becker (1962, 1973) to the realm of empirical science. Becker's analysis was, itself, based on the earlier work of Charles Darwin (1859), Otto Rank (1931), Soren Kierkegaard (1844/1957; 1849/1954), and many others (e.g., Brown, 1959; James, 1902/1963; Yalom, 1980; Zilboorg, 1943). At its most basic level, the theory is concerned with the unique position of humans among their relatives in the animal kingdom. In addition to having a collection of instincts, or built-in biological mechanisms aimed at preserving and continuing life, we are intelligent enough to realize that our efforts are inevitably in vein—everything that lives must

Jamie L. Goldenberg, Tom Pyszczynski, Benjamin Kluck, and Robin Cornwell, Department of Psychology, University of Colorado at Colorado Springs; Jeff Greenberg, Department of Psychology, University of Arizona; Sheldon Solomon, Department of Psychology, Brooklyn College.

This research was supported by National Science Foundation Grants SBR-9312546, SBR-9601366, SBR-9601474, SBR-9731626, and SBR-9729946.

Correspondence concerning this article should be addressed to Jamie L. Goldenberg, who is now at the Department of Psychology, Boise State University, Boise, Idaho 83725–1715. Electronic mail may be sent to jgolden@boisestate.edu.

someday die. Terror management theory proposes that a great deal of human behavior can be understood as an attempt to gain psychological equanimity in the face of this awareness.

From the perspective of terror management theory, it is through culture that humans manage the potential for terror engendered by their awareness of death. Although they vary tremendously, cultural systems are similar in that they all provide a symbolic reality structure for their people (cf. Berger & Luckmann, 1967), which embeds them in a world of meaning that elevates them above mere animal existence. Terror management theory suggests that it is through this culturally derived system of meaning and value that people can begin to manage their existential fears. Specifically, this theory suggests that a cultural anxiety buffer, consisting of (a) faith in a cultural worldview, and (b) self-esteem that is derived from living up to the standards of the worldview, functions to manage the terror associated with the awareness of death. A large body of research has been conducted to test hypotheses derived from terror management theory (for a comprehensive review, see Greenberg, Solomon, & Pyszczynski, 1997).

The terror management theory hypothesis most relevant to the current investigation states that, if a psychological structure (i.e., worldview or self-esteem) provides protection from concerns about death, then reminding people of death should increase their need for that structure. Research has shown that when people are reminded of their own mortality, they respond by clinging to and defending their cultural worldview. For example, subsequent to reminders of death, people like similar others more and dissimilar others less. Similarity has been operationalized by religion (Greenberg et al., 1990, Study 1), ethnicity (Ochsmann & Mathy, 1994), and percentage of attitudes held in common (Greenberg et al., 1990, Study 2). People who directly criticize an important worldview, such as political beliefs or nationalism are responded to with disliking (Greenberg et al., 1990, Study 3) and even aggression (McGregor et al., 1998). Furthermore, after being reminded of death, people advocate more severe penalties for individuals who violated cultural mores and laws (e.g., Florian & Mikulincer, 1997), and they themselves find it more difficult to violate cultural standards and experience greater distress when doing so (Greenberg, Porteus, Simon, Pyzczynski, & Solomon, 1995).

Recent research has also shown that reminding people of their death causes them to behave in ways that enhance self-esteem and to cling to relevant sources of self-esteem (Goldenberg, McCoy, Pyszczynski, Greenberg, & Solomon, 2000; Ben-Ari, Florian, & Mikulincer, 1999). Furthermore, research has compared the effects of reminders of death with those of a wide range of different control conditions (e.g., taking or failing an exam in an important class, being socially excluded, or becoming paralyzed; Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994; Greenberg, Simon, Pyszczynski, & Solomon, 1996; Greenberg et al., 1995). These studies suggest that the effects of mortality salience are specific to death and do not occur in response to thoughts of other aversive events.

Dual Process Theory of Defense Against Conscious and Unconscious Death-Related Thoughts

Although support for the basic hypotheses of terror management theory are well documented, the cognitive processes underlying *the defensive responses to death-related thoughts* have only recently been elucidated (for a thorough review, see Pyszczynski, Greenberg, & Solomon, 1999). On the basis of a large body of evidence, Pyszczynski et al. (1999) argued that two distinct sets of defenses are activated by concerns about death and which type of defense is used depends on whether thoughts of death are or are not in focal consciousness. When death-related thoughts are conscious, the defenses involved are proximal and involve suppression of death-related thoughts (Arndt, Greenberg, Pyszczynski, & Solomon, 1997) or pushing death into the future by denying one's vulnerability to factors that make one susceptible to an early death (Greenberg, Arndt, Simon, Pyszczynski, & Solomon, 2000). In contrast, when thoughts of death are highly accessible but not in focal consciousness (e.g., a short delay after conscious contemplation of death or as a result of subliminal death primes), distal defenses that serve to manage the potential for terror by bolstering faith in one's worldview and self-esteem emerge.

The Problem of Creatureliness

> . . .all systematizations of culture have in the end the same goal: to raise men above nature, to assure them that in some ways their lives count in the universe more than merely physical things count. (Ernest Becker, 1975, p. 4)

Terror management theory and research provides support for the proposition that humans employ a symbolic solution to cope with anxiety associated with the awareness of death. By clinging to sources of self-esteem or one's cultural (political, social, or religious) worldview, human beings can begin to escape their existential burden. However, one consequence of seeking a higher more meaningful existence is that any reminder of our corporeal condition is threatening. From our existential terror management perspective, the body is a particular problem for humans because it serves as a reminder of our animal limitations (cf. Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000). Consequently, our bodies are subject to the rules and dictates espoused by our cultural worldview that serve to elevate them from their flesh and bones reality to a higher plane, as objects of beauty or dignity. Although cultures differ in prescriptions for what is proper and what is attractive, all cultures have such standards.

For example, whereas in Western culture excretory behavior is made proper by keeping it private, the men of the Chagga tribe in Tanzania wear an anal plug to pretend not to defecate (Becker, 1973). Menstruation is kept sanitary in our culture with an ever increasing number of consumer products, whereas some other cultures confine menstruating women to ceremonial menstrual huts (e.g., Benedict, 1959). Men and women of Central Africa view facial scars as attractive (and they will intentionally cut deep wounds in their face to attain such standards; Liggett, 1974), whereas in Western culture we use a great deal of time, money, and beauty products to hide any lines or blemishes that may appear on our skin (Brumberg, 1997). In these and many other ways, the body is transformed from something creaturely and material into something symbolic and ethereal. We suggest that human sexuality, in particular, is transformed from animal to symbolic by embedding it in a system of meaning (e.g., love and marriage) and value or self-esteem (e.g., being desired and being a stud; see Goldenberg, Pyszczynski, McCoy, Greenberg, & Solomon, 1999; and see Kass, 1994, for a similar conceptualization of eating behavior).

Disgust and Distancing From Animals

Rozin, Haidt, and colleagues (e.g., Haidt, Rozin, McCauley, & Imada, 1997; Rozin, Haidt, & McCauley, 1993) have accumulated an impressive array of developmental and cross-cultural research on the emotion of disgust. Although they suggest that disgust probably evolved out of an evolutionary advantage associated with aversive reactions to dangerous food products (e.g., bitter berries), they have theorized that, in humans, disgust is an ideological response to something that is offensive to the self because of its nature or origin, rather than because of a sensory response such as distaste (Fallon & Rozin, 1983). For example, although there is no danger or even distaste associated with drinking one's favorite juice after a dead, but sterilized, cockroach (or even a plastic replica) has been dipped in it, Rozin, Millman, and Nemeroff (1986) found that people are opposed to drinking the juice and declare that the juice is now "disgusting." In contrast with distaste, an object that is deemed disgusting is thought to have the ability to contaminate other objects that come in contact with it. In contrast with danger, disgusting objects usually pose no real threat, but rather, just repulse us deeply.

Rozin et al. (1993) posited that *core disgust* is experienced in response to food products, body products, and some animals. For example, there is a universal aversion to feces (Angyal, 1941), and in all cultures, certain specific animals are considered disgusting and "inappropriate" to eat (Rozin et al., 1993). Rozin et al. suggested that these domains share in common that they remind us of our animalness; disgust can thus be understood as a defense against any reminder of our animal nature. Consistent with Angyal (1941), Rozin et al. (1993) suggested that feelings of disgust function to dignify humanity by allowing humans to put themselves above the animals that are deemed as inferior.

Haidt, McCauley, and Rozin (1994) further suggested that other domains of disgust elicitors, such as poor hygiene, inappropriate sexuality, violations of the body envelope, and contact with death or dead bodies, also make humans aware of their creatureliness and tend to evoke feelings of disgust. At an even more distal level, violations of sociomoral standards (Haidt et al., 1997) are often described as disgusting; however, Haidt et al. (1994) found that this type of disgust (except in the sexual domain) did not correlate reliably with the other domains.

Interestingly, disgust elicited by contact with death was found by Haidt et al. (1994) to be more predictive of general disgust than any other domain of disgust elicitor. Further, Haidt et al. found that sensitivity to disgust was positively correlated with fear of death. They accounted for these findings by suggesting that death is disgusting because it is a very strong reminder of the animal nature of humans. On the basis of Brown (1959) and Becker (1962, 1973), in Study 1, we assessed the opposite causal sequence—that things that remind humans of their animal nature disgust them because their animality reminds them of their vulnerability to death (Rozin, Haidt, McCauley, Dunlop, & Ashmore, 1999, recently also acknowledged the possibility of this causal sequence). By showing disgust toward such things, humans can psychologically distance themselves from the material, creaturely reality these things represent. From this perspective, disgust can be viewed as an emotional response that enables humans to elevate themselves above other animals and thereby defend against death.

Study 1

Examination of the distal defenses initiated by reminding people of their own death can be reduced to one basic commonality: Distal defenses are symbolic and cultural solutions to the problem of death that serve to reinforce the boundary between humans and other animals. A similar logic applies to the disgust response. Disgust can be understood as the emotional protest against any reminder of our creatureliness, an affective assertion that says "I am fundamentally better than that." It follows, then, that if disgust is a response to the potential for anything creaturely to remind humans of their mortality, then reminders of mortality would be expected to increase this disgust response. Furthermore, if disgust is conceptualized as a symbolic distal response, then the disgust reaction would be expected to increase in response to mortality salience only after a delay and distraction, when death-related thoughts are no longer in consciousness (cf. Greenberg et al., 1994; Pyszczynski et al., 1999).

Although we used the most common and well-validated mortality salience induction in this study, the stimuli being reacted to and the dependent measure represent a significant departure from prior research. In most terror management studies, mortality salience participants have been exposed to worldview supportive or threatening targets, and their liking for the targets is assessed. In this study following the manipulation, using a measure developed by Haidt et al. (1994), participants read about various potentially disgusting objects, events, and behaviors and were asked how disgusted they were by them. Thus, in this study, we expected mortality salience to intensify disgust reactions to various naturally occurring reminders of our animal nature.

Method

Participants

Participants consisted of 77 students, 46 female and 30 male (1 student did not report gender), in an introductory psychology class at a university in Colorado. Students participated during their regularly scheduled class session for course credit.

Procedure

The design consisted of randomly assigning students to one of three levels of mortality salience (MS) and measuring the disgust response to various categories of disgust stimuli. The experiment was described as a personality and attitudes assessment, and each student was provided with a packet of material, including several filler measures (i.e., in order of presentation, self-esteem, Rosenberg, 1965; neuroticism, Eysenck & Eysenck, 1967; self-objectification, Noll & Fredrickson, 1998; body self-esteem, Franzoi & Shields, 1984) to lend credence to the cover story. Following the filler measures, MS was induced by varying the content of a questionnaire manipulation (MS or neutral) and the time before the dependent measure was assessed (delayed or immediately after MS). The three conditions for Study 1 were MS–delay, MS–immediate, and neutral–delay. Following this treatment, all participants were provided with the Disgust Sensitivity measure (Haidt et al., 1994).

Materials

MS treatment. MS was manipulated as in previous experiments (e.g., Greenberg et al., 1990) with two open-ended questions concerning thoughts and feelings about one's own death. The questionnaire was posed

as a "projective life attitude assessment" and asked participants to, "Please briefly describe the emotions that the thoughts of your own death arouses in you," and "Jot down, as specifically as you can, what you think will happen to you as you physically die and once you are physically dead." The control condition consisted of parallel questions about watching television.

The three MS conditions were created by combining the open-ended questions with a word-search puzzle to provide the delay and distraction. The puzzle, used in previous research (e.g., Greenberg et al., 1994), consisted of 12 neutral words, which could be found in a matrix of letters. The puzzle took approximately 5 min to complete. In the MS–delay condition, participants first received the two open-ended questions about death, followed by the puzzle, and then the dependent variable; whereas in the MS–immediate condition, the puzzle immediately preceded the open-ended questions to create a condition that differed only in amount of time and distraction before the dependent measure. A neutral condition consisted of television questions followed by the puzzle (there was no reason to suspect that a neutral–immediate condition would differ from the neutral–delay).

Disgust sensitivity. Disgust was measured by using the measure created by Haidt, McCauley, and Rozin (1994). Haidt et al.'s (1994) Disgust Sensitivity measure consists of eight subscales: Animals, Body Products, Food, Sex, Envelope Violations, Hygiene, Sympathetic Magic, and Death. Because we were interested in assessing the effects of MS on disgust sensitivity, it was necessary to discard the Death subscale and one death-related item from the Sympathetic Magic subscale in order not to confound the manipulation. The Disgust Sensitivity measure consists of four items per subscale, two of which are asked in the format of agree–disagree questions and two of which are rated on a scale that ranges from *not at all disgusting* to *very disgusting*. Although Haidt et al. (1994) measured the items with 2- and 3-point scales, to increase variability of responses we used a 9- (1 [*strongly disagree*] to 9 [*strongly agree*]) and 7-point scale (1 [*not at all disgusting*] to 7 [*extremely disgusting*]) and then transformed the 7-point scale to a 9-point scale. Examples of items from each subscale are as follows: Animals, "Seeing a cockroach in someone else's house does not bother me" and "You see maggots on a piece of meat in an outdoor garbage pail"; Body Products, "If I see someone vomit, it makes me sick to my stomach" and "You see a bowel movement left unflushed in a public toilet"; Food, "I might be willing to try monkey meat, under some circumstance" and "You are about to drink a glass of milk when you smell that it is spoiled"; Sex, "I think homosexual activities are immoral" and "You hear about a 30-year-old man who seeks sexual relationships with an 80-year-old woman"; Envelope Violations, "It would bother me to be in a science class, and see a human hand preserved in a jar" and "You see someone accidentally stick a fishing hook through his finger"; Hygiene, "I never let any part of my body touch the seat in public rest rooms" and "You discover that a friend of yours changes underwear only once a week"; and Sympathetic Magic, "Even if I were hungry, I would not drink a bowl of my favorite soup if it had been stirred by a used but thoroughly washed fly swatter" and "A friend offers you a piece of chocolate shaped like dog-doo." Rozin et al. (1999) recently provided convergent and discriminant validation for this paper-and-pencil measure by comparing it to reactions of disgusting and nondisgusting behavioral tasks.

Results

A multivariate analysis of variance indicated that a linear combination of the seven subscales (Animals, Body Products, Food, Sex, Envelope Violations, Hygiene, and Sympathetic Magic) of the Disgust Sensitivity measure differentiated between the three levels of mortality salience, $\Lambda = .721$, $F(14, 74) = 1.73$, $p = .057$; $\tau = .37$, $F(14, 74) = 1.77$, $p = .049$. Also of interest are the univariate relations between the levels of mortality salience and the subscales of Disgust Sensitivity. To this end, we conducted a 3 *(MS)* × 7 *(Disgust Sensitivity subscales)* split-plot factor analysis of variance (ANOVA) with subscales as a within-subject factor. Although there was not a main effect of MS ($p = .42$), the results revealed a main effect for subscales, $F(6, 74) = 20.09$, $p < .0005$, and an interaction between MS and subscales, $F(12, 74) = 2.03$, $p = .02$. Because the main effect of MS was subsumed by the interaction, we conducted separate tests for effects of MS on each of the Disgust Sensitivity subscales.

Contrasts were conducted on the Animals, Body Products, Food, Sex, Envelope Violations, Hygiene, and Sympathetic Magic subscales of the Disgust Sensitivity measure. For each subscale, contrasts were conducted to test whether the MS–delay condition was different from the MS–immediate and neutral–delay conditions and to confirm that MS–immediate and neutral–delay were not significantly different. The MS–immediate and neutral–delay were not significantly different on any of the subscales ($ps > .29$). The Body Products and Animals disgust subscales resulted in significantly greater disgust in the MS–delay compared to the other two conditions, $t(74) = 2.66$, $p = .01$, and $t(74) = 2.47$, $p = .016$, respectively.[1] In addition, the Food subscale approached significance, $t(74) = 1.72$, $p = .09$. Although not significant, the pattern of means was consistent for the Sex and Hygiene subscales. The pattern for Envelope Violations and Sympathetic Magic was quite different, albeit also nonsignificant. The means and standards deviations for each subscale are reported in Table 1.

Discussion

As predicted, mortality salience led people to respond with increased disgust sensitivity to a variety of specific disgust elicitors. This, of course, is consistent with the terror management proposition that people are motivated to distance themselves from other animals because of the association between death and our animal nature. That this effect emerged only after a delay and distraction is consistent with previous terror management research (e.g., Greenberg et al., 1994), providing support for the dual process theory of defense (Pyszczynski et al., 1999) and suggesting that the disgust reaction is a distal and symbolic means of coping with the problem of death (cf. Pyszczynski et al., 1999), by enabling us to elevate ourselves above the rest of the animal kingdom.

Although only the Body Products and Animals subscales of the Disgust Sensitivity measure yielded significant effects of mortality salience, the pattern of means for all but two of the other subscales were in the predicted direction, and a significant multivariate effect was found on the entire set of subscales. Interestingly, the Body Products and Animals subscales seem the most directly related to the threat of creatureliness, in that they deal with things such as cockroaches, maggots, vomit, and feces. Although Haidt et al.

[1] In addition to planned orthogonal contrasts, we ran a separate univariate ANOVA on each of the subscales of the Disgust Sensitivity measure. Individual ANOVAs revealed that the Body Products and Animals disgust subscales yielded significant effects of mortality salience, $F(2, 74) = 3.59$, $p = .033$, and $F(2, 74) = 3.12$, $p = .05$, respectively. Additionally, for both the Body Products and Animals disgust subscales, pairwise comparisons between conditions revealed that the MS–delay condition resulted in greater disgust than both the MS–immediate and the TV–delay conditions, whereas there was no difference between both the MS–immediate and the TV–delay conditions.

Table 1
The Effect of Mortality Salience (MS) on the Subscales of Disgust Sensitivity

	MS					
	MS–delay		MS–immediate		TV–delay	
Disgust subscale	*M*	*SD*	*M*	*SD*	*M*	*SD*
Body Products	6.64	1.37	5.72	1.43	5.81	1.29
Animals	6.56	1.60	5.57	1.72	5.71	1.30
Food	6.07	1.17	5.68	1.51	5.35	1.36
Hygiene	5.44	1.22	5.04	1.36	5.17	1.52
Envelope Violations	5.10	1.96	5.01	1.97	5.58	1.84
Sex	6.98	1.26	6.88	1.47	6.82	1.36
Sympathetic Magic	4.93	1.61	5.12	2.02	5.64	1.64

Note. Disgust sensitivity score means have a possible range from 1 to 9.

(1994) described disgust as a distancing from animals response, it may be that some items on their measure more directly reflected this dimension than others. For example, items on the Sex subscale such as, "You hear about a 30-year-old man who seeks sexual relationships with an 80-year-old woman," may better reflect sociomoral violations, and items on the Food subscale such as, "You see someone put ketchup on vanilla ice cream, and eat it," may reflect more of a distaste response than disgust. Indeed, in an interitem analysis of their measure, Rozin et al. (1993) found that items from the Body Products and Animals subscales (along with items on the Death subscale) were most predictive of total disgust scores. The fact that Study 1 found death-related thought to produce significant effects on only these two subscales is consistent with this pattern of association.

Although the Sympathetic Magic subscale did not follow the same pattern, this was not really a complete subscale, as one item was omitted due to its mention of death. Further, magical thinking (the idea that disgusting stimuli infect other neutral stimuli by contact or similarity) is not really a disgust domain, but a property of disgust, and therefore we had no theoretical foundation for predicting that death would alter this property of disgust. We are frankly at a loss to explain why the effect for body Envelope Violations was not in the same direction as the other subscales. Although we did believe that death should make seeing a human hand preserved in a jar more threatening, it might be that these items were so closely related to death that they led to a sustained proximal suppression response rather than the distal intensified disgust response. Alternatively, the artificial, modern, technoscientific nature of the stimuli described (e.g., a glass eye) may have removed these items from the realm of reminding the participants of creatureliness or animality. Of course, pending further investigation, the results on this scale should probably be viewed as an open issue requiring further research.

Still, given the positive findings on the other scales, some clear preliminary support was obtained for our hypothesis that reminders of one's death would result in increased efforts to distance from reminders of creatureliness in the form of enhanced disgust. Disgust is an affective means by which such distancing can be accomplished, but there are undoubtedly other ways to distance as well. Study 2 was conducted to assess such distancing in another way.

Study 2

If being an animal is threatening for humans because of the link to the problem of death, then reminders of one's own mortality should increase this need to distinguish oneself from other animals. We investigated this hypothesis more directly in Study 2 by reminding participants of their death and then assessing their reactions to an essay that suggested that humans are very similar to animals and an essay that said that humans are really quite unique. Our hypothesis was that after being reminded of one's own death, participants would express more positive reactions to an essay that focused on how humans are different from animals compared with one that pointed out how humans and animals are similar. Both essays were designed to be consistent with prevailing American worldviews; the unique essay emphasized the special potential of humans in the spirit of humanistic psychology, whereas the similar essay emphasized a Darwinian biological determinism perspective. An additional purpose of Study 2 was to compare mortality salience to a control condition that involves another type of aversive thought, to assess whether the distancing from animals response, like other defensive responses to mortality salience, is specific to death, or a general response to thoughts of any unpleasant topic.

Method

Participants

Participants were 41 undergraduate students (18 female and 23 male) enrolled in introductory psychology courses at two universities in Colorado. Students signed up to participate in sessions run outside of class in order to receive extra credit.

Procedure

Sessions ranged in size from 3 to 10 students. Participants were asked to participate in two short studies. It was explained that to save time the experimenter had stapled the material for both studies together, but that when they reached a page labeled "Study 2," they were to wait for further instructions. The first study was described as an assessment of the personality and attitudes of college students. The material for this study consisted of several filler questionnaires followed by a mortality salience manipulation and a measure of affect. When all students had completed Study 1, the experimenter explained that earlier in the semester, essays on various topics were collected from honors students at a local university. They were further told that they had each been randomly assigned an essay to read and were to provide their opinion. In actuality, there were two essays: one that talked about the similarity between humans and animals and one that described humans as distinct from animals. The essays were followed by questions that assessed reactions to the essay and opinions of the author. The packet concluded with a form that assessed reactions to the study; specifically, participants were asked what they believed to be the true purpose of the study. Neither here, nor in an informal debriefing in which participants were probed for suspicion, did any participants report that they thought the two studies were related to each other.

Materials

MS treatment. MS was manipulated, as in Study 1, with two open-ended questions about one's own death. Participants in the control condition responded to parallel questions about another aversive topic: experiencing dental pain. The manipulation followed the same filler measures as in Study 1.

Affect. In this study, the mortality salience manipulation was followed by the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988). This measure was included to assess any effect of MS on affect and also to provide a delay and distraction as was shown in Study 1 and prior research (e.g., Greenberg et al., 1994) to be necessary to produce symbolic worldview defense in response to MS.

Essay theme manipulation. To assess the need to see oneself as distinct from other animals, participants were provided with an essay with one of two themes: the similarity of humans to other animals or the uniqueness of humans as compared with other animals. The former essay claimed that

> the boundary between humans and animals is not as great as most people think. . .what appears to be the result of complex thought and free will is really just the result of our biological programming and simple learning experiences.

The latter, on the other hand, stated that

> although we humans have some things in common with other animals, human beings are truly unique. . .we are not simple selfish creatures driven by hunger and lust, but complex individuals with a will of our own, capable of making choices, and creating our own destinies.

Both essays were titled, "The most important things that I have learned about human nature."

The essay was followed with six questions assessing reactions to the essay and the author. Specifically, participants were asked, "How much do you think you would like this person?" "How intelligent do you believe this person to be?" "How knowledgeable do you believe this person to be?" "Is this person's opinion well-informed?" "How much do you agree with this person's opinion?" and "From your perspective, how true do you think this person's opinion is of the topic they discussed?" All items were responded to on 9-point scales, with 1 reflecting the most negative evaluation and 9 the most positive evaluation.

Results

Reactions to the Essays

A composite measure of reactions to the essays was created by computing the mean response to each of the six questions. An assessment of the internal reliability for the measure revealed that Cronbach's Alpha was .86 for both essay themes. A 2 (MS) × 2 (theme of essay) ANOVA was therefore conducted on reactions to the essay. The analysis revealed a main effect of essay theme, $F(1, 37) = 15.33$, $p < .0005$. Individuals who received the essay that argued that humans are unique reported more positive reactions to the essay than did those who received essays that argued that humans are similar to animals. The mean score on the scale, with possible scores ranging from 1 to 9 (least to most positive, respectively), was 6.42 ($SD = 1.31$) in the humans-are-unique condition compared to 4.80 ($SD = 1.52$) in the humans-are-animals condition.

This analysis, however, was qualified by a significant interaction between MS and theme of essay, $F(1, 37) = 4.14$, $p = .049$. Tests for simple main effects revealed that MS participants preferred the essay that distinguished humans from animals to the essay in which humans were portrayed as similar to animals, $F(1, 37) = 16.48$, $p < .0005$. In the dental-pain condition there was no difference in evaluations of the two essays ($p = .18$), which is consistent with our contention that both essays fit within the participants' worldviews. As expected, the essay depicting humans as distinct from animals was preferred to a greater extent in the MS condition than in the dental-pain condition, $F(1, 37) = 4.74$, $p = .036$. There was surprisingly little difference between the MS and dental-pain condition on reactions to the essay that depicted humans as similar to animals ($p = .47$), although the means were in the expected direction. Relevant means and standard deviations are presented in Table 2.

Affect

Individual t tests that were conducted on the negative and positive affect subscales of the PANAS to see whether the MS manipulation produced any affective reactions that may have contributed to the reactions to the essays revealed no significant effects ($ps > .76$).

Discussion

The findings of Study 2 provide more direct support for the hypothesized need for humans to distinguish themselves from other animals. Moreover, the results suggest that this need is motivated by thoughts of death, and not thoughts of another unpleasant event (i.e., dental pain). Interestingly, the effect of MS was stronger for reactions to the "humans are unique" essay than for reactions to the "humans are animals" essay. MS participants may have found the essay portraying humans as unique particularly useful for bolstering their worldview and denying their creatureliness. The "humans are animals" essay, although of little comfort, may not have been particularly threatening, especially because the arguments were couched in scientific jargon and were consistent with what the participants were learning in their introductory psychology course. It is also possible that the participants felt restrained to derogate the "humans are animals" essay beyond midrange ratings because of the quality of the writing or concerns with being fair and kind to the student author.

General Discussion

Studies 1 and 2 tap two different manifestations of the human desire to distinguish one's self from the animals. Study 1 provided support for an emotional protest against that which reminds us of our creatureliness, as has been discussed extensively by researchers of disgust (e.g., Rozin et al., 1993). The present findings advance our understanding of this emotion by providing the first experimental evidence that disgust, at least in response to direct reminders of creatureliness, may function as a protest against death. Specifically, Study 1 showed that after reminders of death,

Table 2
The Effect of Mortality Salience (MS) and Essay Theme on Reactions to Essays

	MS			
	MS		Dental pain	
Essay theme	*M*	*SD*	*M*	*SD*
Humans are special	7.10	0.89	5.80	1.36
Humans are animals	4.56	1.64	5.00	1.47

Note. Reaction to essay score means have a possible range from 1 to 9.

people were more disgusted by body products and animals. The findings of Study 2 showed that, in comparison to an aversive control topic, MS leads to increased preference for an essay that argues that humans are unique over an essay that argues that humans are similar to other animals, providing more direct evidence that the human inclination to distance from other animals is motivated by concerns about death. This study may also shed light on how emotional responses to animal reminders may play a role in shaping the cultural worldviews of humans, and consequently in specifying important determinants of self-esteem. Although there are countless variations in worldviews and sources of self-esteem across cultures, we suggest that distinguishing ourselves from animals may be an important component of the way in which most, if not all, worldviews protect humans from anxiety associated with the awareness of death.

Maladaptive Ways People Distance From Other Animals

These analyses provide one explanation for the rigor with which humans strive to meet the standards of their culture, many of which aim to exert control over human nature. Most notably, the human body and its functions are so controlled by the dictates of culture that the body often becomes a source of distress, shame, and embarrassment when people fail to sustain such control.

Ironically, these attempts to control the body may ultimately undermine the individual's health and hasten his or her demise. In contemporary Western culture, women's bodies are expected to be thin (and standards are becoming thinner; Garner, Garfinkel, Schwartz, & Thompson, 1980) and men's bodies are expected to be strong and muscular (e.g., Franzoi, 1995). Consequently, most Americans are dissatisfied with their bodies (e.g., Silberstein, Striegel-Moore, Timko, & Rodin, 1988). As a consequence, people often go to extensive lengths to perfect themselves, such as strenuous exercise (e.g., Smith, Handley, & Eldredge, 1998), excessive dieting (e.g., Chernin, 1981; Raudenbush & Zellner, 1997), steroid abuse, and even plastic surgery. Further, people who are particularly dissatisfied with their bodies often suffer from low self-esteem (e.g., McCaulay, Mintz, & Glenn, 1988), depression, (e.g., Noles, Cash, & Winstead, 1985), and anxiety (e.g., Cash & Szymanski, 1995).

Other cultures, in other historical contexts, also have gone (and still go) to extreme lengths to attain their cultural standards for the body. For example, Chinese women used to cripple themselves in an attempt to reduce their foot to one-third its size (Brownmiller, 1984). Even today, some men and women of northeastern Uganda cut a hole the size of a nickel through their lower lip (Allgeier & Allgeier, 1995), and women among the Karen of upper Burma jewel their necks with metal rings that can stretch the neck so long that if they were to remove the rings they would die because they haven't the muscle strength to support their head (Morris, 1985). Morris also reported that the Ibans of Malaysia drill holes in their front teeth and fill them with brass; although this may seem odd from our own cultural perspective, the Denver Post recently reported (Briggs, 1999) that some die-hard Bronco's fans have tattooed the team insignia on their front teeth.

As our work suggests (e.g., Goldenberg et al., 1999), sex may be particularly important to control in part because it so clearly suggests our underlying animal nature. Accordingly, there are countless examples of cross-cultural and historical manifestations of sexual regulation. To cite just a few, women in many African countries and some parts of Asia undergo a procedure in which the clitoris is removed and the vagina is stitched up to assure chastity prior to marriage; in the Middle Ages of European culture, women were required to wear metal chastity belts to achieve the same end. Although one might be tempted to view contemporary Western culture's more permissive attitudes about sex as a sign that we are no longer "hung up," sex is still highly regulated (e.g., debates still roar about teaching human sexuality in the classroom) and anxiety-provoking (e.g., the majority of parents are still uncomfortable talking with their children about sex; "Parents Need to Talk," 1998).

Is Distancing From Other Animals a Universal Feature of Human Culture?

Of course, extensive cross-cultural research would need to be undertaken before any claims of a universal function of culture could be verified. We have argued that culture helps humans to deny their creatureliness, and therefore, their mortality. However, even granting the proposition that all worldviews help people manage their terror of death, there may be cultural differences in the need to distance from animals. It appears that some cultures go through extreme lengths to distinguish themselves from animals, whereas others seem more "at one with nature." We have recently suggested (Goldenberg, Pyszczynski, et al., 2000) that when cultures do embrace nature, they also tend to imbue nature with supernatural significance, because this symbolic meaning strips nature of its more threatening mortality-related qualities. Such worldviews eliminate the need to distance from other animals—if other animals have souls that transcend their mortal coils, we humans seem most happy to count ourselves among them. Nevertheless, even if specific to certain cultures, and even if the behaviors that distinguish us from animals serve other functions as well, the present work suggests that such distancing plays a role in human defense against death. To the extent that these tendencies may contribute to personal and social problems, the terror management perspective on why we are motivated to deny our animality may have important implications for efforts to find solutions to these problems.

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Received February 11, 2000
Revision received June 21, 2000
Accepted June 21, 2000 ■