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Creatureliness Priming Reduces Aggression and Support for War

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Abstract

Terror management theory (TMT) posits that humans distance themselves from, or elevate themselves above, other animals as a way of denying their mortality. The present studies assessed whether the salience of aggressive tendencies that humans share with other animals make thoughts of death salient and whether depicting human aggression as animalistic can mitigate aggressive behavior and support for aggression. In Study 1, participants primed with human-animal similarities (i.e., human creatureliness) exhibited elevated death-thought accessibility after hitting a punching bag. In Studies 2a and 2b, creatureliness priming caused participants to hit a punching bag with less frequency, perceived force and comfort. In Study 3, participants primed to view violence as animalistic exhibited increased death-thought accessibility and reported less support for war against Iran. These studies suggest that portraying violence as creaturely may reduce the intensity of aggressive actions and support for violent solutions to international conflicts.

Creatureliness Priming Reduces Aggression and Support for War

People in Western cultures expend a great deal of time and energy denying or diminishing their similarities to other animals (i.e., their creatureliness). They buy expensive personal care products to hide naturally-occurring scents and they wax, shave, pluck, and laser away undesired body hair. They eat their food with culturally-appropriate utensils and observe “polite” customs such as chewing with mouths closed. Becker (1973) posited that these uniquely human behaviors function to elevate humans above the status of physical—and therefore mortal—creatures. Following Becker, terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) posits that death denial is a primary force that motivates behavior that distances humans from other animals (e.g., Goldenberg et al., 2001).

TMT research has also demonstrated, in hundreds of studies over the past three decades, that existential fears can increase intergroup aggression and hostility (e.g., Pyszczynski et al., 2006; for a meta-analysis reviewing these and related effects, see Burke, Martens, & Faucher, 2010). For instance, participants primed to think of their deaths administered more hot sauce to people who disagreed with their political views (McGregor et al., 1998). In other studies, fundamentalist Christians in the United States and fundamentalist Muslims in Iran asked to contemplate dying demonstrated increased support for extreme military tactics and suicide terrorism (Rothschild, Abdollahi, & Pyszczynski, 2009).

The “creatureliness” and “aggression” lines of TMT research converge in an interesting way. Namely, people’s tendency to deny their animality suggests a novel method of discouraging aggression and reversing the tendency to respond to existential threat with hostility toward enemies. If people with aggressive inclinations construe aggression as primal, instinctual, and animalistic, it should undermine their ability to view themselves as different from other animals

and therefore discourage aggression by stripping it of its existentially palliative function. Although existential concerns often motivate intergroup hostility, the present research investigated the possibility that priming existential concerns associated with human creatureliness can *reduce* aggression and support for war.

Terror Management Theory

TMT posits that awareness of their inevitable mortality makes humans unique among organisms. This awareness is a source of ongoing, potentially debilitating anxiety, even in the absence of any immediate threat to one's life. According to TMT (Greenberg et al., 1986), humans manage this potential for anxiety with a defensive system consisting of cultural worldviews and self-esteem (and close interpersonal attachments; see Hart, Shaver, & Goldenberg, 2005; Mikulincer, Florian, & Hirschberger, 2003) which enable them to keep death concerns at bay and live with equanimity.

Cultural worldviews help defend against death anxiety by embedding people in a system of meaning that makes reality seem permanent, predictable, and stable. Culture also provides people with the belief that they can transcend death in one of two ways: (a) literally, whereby people live eternally in places like Heaven or by achieving Nirvana, or, (b) symbolically, whereby people contribute something that endures beyond death, for example, through creative achievements, or by living on in the memories of others. TMT further posits that only persons who feel valuable due to satisfying the standards of value prescribed by their cultural worldviews are "eligible" for either type of immortality. Thus, effective terror management requires both self-esteem and faith in one's cultural worldview—the belief that one is a valued contributor to a meaningful reality.

However, worldviews are fragile social constructions that require ongoing validation from others. Faith in one's worldview can be threatened by the recognition of alternative worldviews (Berger & Luckmann, 1966) because of the implication that one's own view of reality is incorrect. The resulting potential for existential anxiety leads people to assert the superiority of their worldviews by viewing fellow adherents positively, attempting to convert followers of other worldviews, and derogating those who persist in challenging their worldview. In particularly ghastly cases, people will support the killing of those who threaten one's system of meaning (e.g., Hirschberger & Ein-Dor, 2006; Pyszczynski et al., 2006).

Creatureliness

Another way that humans use symbolic meaning systems to quell their fear of death is by defensively denying their flesh and bone existence by distancing themselves from other animals (Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000). Many worldviews contain ways to help humans distance themselves from the knowledge that they are housed in a physical, and thus mortal, body. For example, women in Western cultures spend millions of dollars each year on body products and surgical procedures to appear ageless (Brumberg, 1997) and men of the Chagga tribe in Tanzania wear anal plugs to deny that they defecate (Becker, 1973).¹

Research supports the TMT contention that mortality concerns actuate people's distancing from their creaturely nature. For example, Goldenberg et al. (2001) demonstrated that mortality salience (MS) increased disgust-responses to animal and body products. MS also decreased liking for the author of an essay suggesting that humans are similar to other animals relative to the author of an essay suggesting humans are very different from animals. Similarly, Cox, Goldenberg, Arndt, and Pyszczynski (2007) reported that MS led people to sit farther away from a breastfeeding, but not a bottle-feeding, mother. Finally, after MS, people spend less time

engaging in certain overtly physical behaviors (e.g., pelvic thrusts, Goldenberg, Heflick, & Cooper, 2008), and they perceive their ingroup members as more distinct from animals (Vaes, Heflick & Goldenberg, 2010).

Research has also documented the latent threat of mortality associated with human creatureliness by revealing that thoughts about death become more accessible when people are asked to contemplate behaviors shared by humans and animals. Goldenberg, Cox, Pyszczynski, Greenberg, and Solomon (2002) demonstrated that thinking about the physical aspects of sex, but not the more uniquely human romantic aspects, led to heightened accessibility of death-related thought among participants who had read essays highlighting humans' similarities to animals (Goldenberg et al., 2001). This effect was mitigated when people thought about how they are different from animals (Goldenberg et al., Study 2). Likewise, Cox, Goldenberg, Pyszczynski, and Weise (2007) demonstrated that viewing pictures of bodily excrements increased accessibility of death-related thoughts and that this effect was exacerbated by a creatureliness prime (i.e., the essay emphasizing humans' similarity to other animals).

Thus, if concerns about creatureliness are linked to an existential threat associated with mortality, then people should distance from physical, body-oriented behaviors when creatureliness has been primed (even without any explicit mortality reminder). In support of this, Goldenberg, Goplen, Cox, and Arndt (2007) found that priming creatureliness led to negative reactions to female celebrities depicted as pregnant, but not the same celebrities depicted as not-pregnant. Similarly, Cox et al. (2007) found that priming creatureliness led to more negative evaluations of celebrities who were breastfeeding their babies. These studies suggest that people distance themselves from their creatureliness as a way to defend against latent fears of death.

Terror Management, Creatureliness, and Aggression

Aggression is one of many behaviors shared by humans and other animals, who both engage in hostile and instrumental aggression, driven by primary emotions or some desired goal (Berkowitz, 1993; Bushman & Anderson, 2001; McElliskem, 2004). Common physiological substrates (e.g., testosterone) underlie the exhibition and inhibition of aggressive behaviors among humans and animals (Caramaschi, Boer, Vries, & Koolhaas, 2008; Mazur & Booth, 1998). Given these similarities and the fact that people view the traits of civility and self-control (which run counter to aggression) as uniquely human (Loughnan & Haslam, 2007), people should readily perceive aggression as animalistic.

TMT's analysis of the existential problem of human creatureliness suggests that construing aggressive behavior in this way should reduce its appeal, as people (subconsciously) seek to protect themselves against existential concerns by avoiding self-comparisons to animals (Goldenberg, Heflick, Vaes, Motyl, & Greenberg, 2009). Preliminary evidence shows that when people are reminded of similarities between human and animal aggression, MS reduces endorsement of aggressive solutions to conflicts (Motyl, Hart, & Pyszczynski, 2009). However, this reduction was found only among right-wing authoritarians on a self-report measure of support for military aggression. The current research extends this finding in several ways.

First, Motyl et al. (2009) suggested that people are likely to find aggression aversive if it is depicted as creaturely *because* endorsing aggression in that context would raise existential concerns. However, they manipulated MS rather than measuring it, leaving open the question of whether intimations that aggression is creaturely would naturally elicit death thoughts, as implied by Motyl et al. We examined this question in Studies 1 and 3, thereby providing a more direct test of mechanism, as well as examining a potential boundary of the relevant effects (i.e., would they occur, as our theoretical analysis suggests, in the absence of an explicit MS manipulation).

Second, Motyl et al. (2009) explicitly depicted aggression as creaturely in one of their critical experimental conditions. It is worth exploring, as Studies 1-2b do, whether a simple reminder that humans are animals would be sufficient to arouse death thoughts in response to one's own aggressive action and to inhibit such action; this would suggest that people associate (their own) aggression with creatureliness, even when aggression is not explicitly depicted as creaturely.

Last, and perhaps most importantly, in Studies 1–2b we used a behavioral measure of aggression, hitting a punching bag. We chose this measure because it extends the findings of support for military aggression used by Motyl et al. (2009) to a physical action that is commonly involved in aggressive behavior; this measure has been validated in several previous studies of aggressive behavior (e.g., Bosson, Vandello, Burnaford, Weaver, & Wasti, 2009; Bushman, Baumeister, & Stack, 1999). Also, in contrast to the attitudinal measure of support for military aggression used by Motyl et al., this measure is unlikely to be affected by personality variables such as right-wing authoritarianism, because it is not associated with actively politicized issues.² Finally, in Study 3, we combine the previous analyses by examining support for military aggression in conjunction with measuring death-thought accessibility (DTA), providing a comprehensive analysis of the effects of associating aggression with creatureliness.

Study 1

To test whether aggression is existentially concerning if it is construed as creaturely, Study 1 examined whether engaging in physical aggression would elevate DTA. Our analysis suggests that this would be true whenever the animalistic connotations of aggression are salient, so we expected the effect to occur as a function of whether people are reminded of the similarities between humans and other animals. Thus participants were induced to think about

humans as either similar to or different from other animals before either hitting a punching bag or listening to music for 90 s. DTA was then assessed with a word stem completion measure (Hayes, Schimel, Arndt, & Faucher, 2010). Based on the above reasoning, we hypothesized that hitting a punching bag, but not listening to music, would increase DTA when human-animal similarities were primed but not when human uniqueness was primed.

Method

Participants

Sixty-nine undergraduate women at the University of California-Davis participated for course credit.³ Ages ranged from 18 to 27 ($M = 19.62$, $SD = 1.86$). Participants were Caucasian (41%), Asian (38%), Hispanic (6%), and Black (3%), with the remainder indicating “other.”

Procedure

Participants were randomly assigned to one of four conditions. First, participants were exposed to a creatureliness prime emphasizing human-animal similarities or a uniqueness prime emphasizing human-animal differences. Then, participants engaged in either an aggressive activity, punching a punching bag (e.g., Bosson et al., 2009), or a non-aggressive activity, listening to music. The punching bag activity was described as “exercising with a cardio-boxing technique,” a popular exercise activity. Participants were instructed to punch the bag continuously for 90 s, after which their reactions would be assessed. In the control condition participants were given the same instructions but were told they would be “relaxing by listening to music.” The music was Handel’s “Water Music.” After indicating when to begin, the experimenter left the room and instructed them to stop when 90 s elapsed. At that time, they completed the DTA measure and provided their reactions to the activity.

Materials and Apparatus

Creatureliness Essay. Following Goldenberg et al. (2001), creatureliness was manipulated by having participants read essays about the most important things learned in college. The creatureliness essay stated that “the boundary between humans and animals is not as great as most people think...our bodies work in pretty much the same way...human beings are just another species of animals...not different in any really important or meaningful way...” The uniqueness essay stated that “the only thing that my education has made clear to me is that, although we humans have some things in common with other animals, human beings are truly unique...the human mind and spirit go far beyond anything remotely similar to what is found in simple animals...unlike animals, humans live in a world of ideas and concepts, morals and values...” (see Goldenberg et al., for complete essays).

Affect. Although previous research found the creatureliness essay manipulation does not affect mood (Goldenberg et al., 2001; Goldenberg, Cox, Greenberg, Pyszczynski, & Solomon, 2002), we included the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) to verify this, and to control for any effects of mood in the analyses. The PANAS includes 20 items rated from 1, *very slightly or not at all*, to 5, *extremely*.

Physical Activity and Behavior. The punching bag was a stationary aerobic bag positioned to stand 5 ft high. Participants wore overstuffed boxing gloves while punching.

Death-thought Accessibility. A word-fragment completion task frequently used in other TMT studies measured DTA (e.g., Goldenberg et al., 1999; Schimel et al., 2007; Schmeichel & Martens, 2005). Participants were provided with 25 word fragments, five of which could be completed with either a death-related or neutral word. (e.g., COFF__ could be completed as “COFFIN” or “COFFEE”). DTA scores consisted of the total number of death-related responses.

Physical Activity Evaluation. After punching the bag, participants responded to three items asking how much they liked using it, how satisfying it was, and how comfortable they felt using it (on a 9-point scale ranging from 1 = “not at all” to 9 = “very much”). These items formed a reliable scale ($\alpha = .91$).

Essay Evaluation. As in Goldenberg et al. (2001), six items assessed participants’ evaluation of the author of the creatureliness essays (on a 9-point scale, 1 = the most negative evaluation, 9 = the most positive). Although previous research has found that people evaluate the creatureliness essay’s author more negatively, controlling for such evaluations has not affected outcomes in previous research (Goldenberg, et al., 2008). The essay evaluation was included to maintain the cover story and to confirm that the findings remain when controlling for the essay evaluations. Lastly, demographics were assessed and participants were probed for suspicion; no participant guessed the hypotheses.

Results

A 2 (creatureliness vs. uniqueness) x 2 (boxing vs. music) ANOVA on DTA revealed only the hypothesized interaction, $F(1, 65) = 5.97, p = .02, \eta_p^2 = .08$, in which punching (relative to music) led participants to complete word fragments with more death-related words when primed with creatureliness, $F(1, 31) = 5.75, p = .03, \eta_p^2 = .15$, but not uniqueness, $p = .30$. In the punching condition, DTA was higher after the creatureliness than the uniqueness prime, $F(1, 32) = 4.80, p = .04, \eta_p^2 = .13$, whereas in the music condition there was no difference ($p = .23$). (See Figure 1.)

We tested self-reported evaluation of the punching activity and found a main effect for the activity, $F(1, 65) = 16.33, p < .01, \eta_p^2 = .20$, and for creatureliness, $F(1, 65) = 5.78, p = .05, \eta_p^2 = .08$. Boxing was enjoyed less than listening to music ($M = 5.91, SD = 1.91$ vs. $M = 7.35,$

$SD = 1.28$) and creatureliness reduced enjoyment overall compared to uniqueness ($M = 6.30$, $SD = 1.76$ vs. $M = 6.95$, $SD = 1.74$). There was no interaction ($p = .62$).

We also examined participants' essay evaluations and self-reported mood. Participants reported liking the uniqueness essay better than the creatureliness essay, $F(1, 65) = 6.30$, $p = .02$, $\eta_p^2 = .09$, ($M = 6.19$, $SD = 1.59$ vs. $M = 5.12$, $SD = 1.96$) and their mood was more positive after the uniqueness essay than the creatureliness essay, $F(1, 65) = 8.56$, $p = .01$, $\eta^2 = .12$, ($M = 2.53$, $SD = .72$ vs. $M = 2.09$, $SD = .59$). There was no difference in negative affect ($p = .15$). Importantly, although there was a main effect on liking for and positive affect as a result of the uniqueness essay, it is not likely that these reactions played a role in the DTA effect since these were only main effects (there was no interaction with activity, $ps > .50$) and controlling for essay evaluations and mood had no effect on the significant interaction between creatureliness and activity ($p = .02$).

Discussion

Results supported the hypothesis that juxtaposing a creatureliness prime with an aggressive activity increases the accessibility of death-related thoughts. In contrast, DTA did not increase after creatureliness priming when people listened to music, a non-aggressive, non-creaturely activity; nor after punching when uniqueness was primed. This suggests that it is specifically the association between creatureliness and aggressive behavior that triggers mortality concerns. Consistent with past research (Goldenberg et al., 2008), we found that participants liked the uniqueness essay more than the creatureliness essay, and unlike prior research (e.g., Goldenberg et al., 2001) we found that the uniqueness essay led to greater positive affect. TMT suggests that participants should be comforted by thoughts of how they are distinct from animals, which would explain the elevated positive affect. Importantly, though, physical activity did not

interact with the essays to increase positive affect and positive affect did not mediate the effects on DTA, suggesting that effects on DTA were not due to conscious changes in positive affect or general liking for the essay. This finding also argues against the possibility that the effects were due to the music condition inhibiting the effects of the creatureliness prime.

According to our theoretical analysis, to the extent that thoughts of death become activated in the context of acting aggressively when creatureliness is primed, it follows that people should be motivated to inhibit their aggressive behavior when primed with creatureliness. (This would enable them to avoid the uncomfortable juxtaposition of their own aggression with that of other animals and make it easier to maintain the anxiety-assuaging view that they are more than simple physical biological entities.) Studies 2a and 2b assessed this prediction.

Study 2a

To test the prediction that a creatureliness prime highlighting the similarities between humans and other animals would cause participants to inhibit aggressive activity, Studies 2a and 2b again used Bosson et al.'s (2009) punching bag aggression paradigm. In contrast to Study 1, participants were instructed to hit the punching bag for as long as they liked. We hypothesized that participants primed with creatureliness would inhibit the number and ostensible force of punches, and would appear less comfortable with this activity relative to participants in the comparison conditions. In Study 2a, we included a third, no essay condition, as a baseline to determine whether the creatureliness essay was instrumental in reducing the vigor of aggressive action or whether the uniquely human essay could be increasing it.

Method

Participants

Sixty-two female undergraduates at the University of California-Davis participated in exchange for course credit. Participants ranged in age from 18 to 30 ($M = 20.24$, $SD = 2.34$). Participants were Asian (57%), Caucasian (24%), Hispanic (5%) and Black (2%), with the remainder indicating “other.”

Procedure and Materials

A female experimenter explained to individually-run participants that they would be participating in two brief studies, a personality and attitudes questionnaire, and an “experiential activity” involving punching a punching bag, which ostensibly examined the therapeutic value of venting emotions. After completing a packet of materials including the same creatureliness manipulation as in Study 1 (with the addition of the no-essay control condition), participants were brought into another room containing the punching bag. The experimenter asked the participant to put on boxing gloves and then to punch the punching bag for “as long as you would like, but please do use it so you have some basis on which to evaluate it.” The experimenter left the room and a video camera concealed behind a one-way mirror recorded each session. Following debriefing, all participants agreed to have their video footage used for the study.

Physical Activity and Behavior. A rater blind to conditions counted the number of punches. Judgments of perceived force and comfort were more subjective and thus ratings of two independent raters were averaged. Each rater estimated how hard the participant punched and how comfortable he/she seemed, on a scale of 1 - 4 (1 = “*not at all*” to 4 = “*very*”). The Pearson’s correlation coefficients between raters was $r = .65$ for perceived force and $.67$ for comfort. Participants’ self-reported enjoyment was assessed with the three items used in Study 1 ($\alpha = .91$).

Results

One-way ANOVAs showed that the creatureliness manipulation affected number of punches, $F(2, 59) = 4.56, p = .01, \eta_p^2 = .13$. Participants in the creatureliness condition punched less than participants in the uniqueness and control conditions (See Table 1 for all descriptive statistics). Creatureliness also affected ratings of perceived force and comfort, $F(2, 59) = 3.81, p = .03, \eta_p^2 = .11$, and $F(2, 59) = 3.40, p = .04, \eta_p^2 = .11$, respectively. Participants were perceived to punch softer in the creatureliness condition compared to the uniqueness and no-essay comparison conditions. Similarly, participants appeared least comfortable punching when primed with creatureliness compared to the uniqueness and no essay conditions. Results also revealed that creatureliness priming affected participants self-reported enjoyment of the task, $F(2, 59) = 3.27, p = .05, \eta_p^2 = .10$. Participants enjoyed the task less in the creatureliness compared to the uniqueness and no-essay conditions.

Creatureliness did not influence negative ($p = .62$) or positive affect ($p = .61$), nor was there a difference between the two essay conditions on evaluations of the essays ($p = .87$). Thus, neither mood nor evaluations of the essay could account for the results.

Study 2b

Study 2b replicated Study 2a except for two critical changes. First, males were included to assess generalizability and to rule out alternative explanations based on gender; second, the punching activity was framed as a “marketing trial” to ensure that framing of the task (e.g., participants could have perceived the task as relevant to self-esteem or emotional state) could not account for the results obtained in Studies 1 and 2a. Again, participants were primed with human creatureliness or uniqueness and then asked to punch a punching bag for as long as they would like. Because the uniqueness and no-essay conditions did not differ in Study 2a (nor in other

research using all three conditions; Goldenberg et al., 2008), we did not include a no-essay condition in Study 2b.

Method

Participants

Forty students (22 female, 18 male) at the University of South Florida participated in the study to satisfy a course requirement. Participants ranged in age from 18 to 24 ($M = 19.53$, $SD = 1.77$) and were Caucasian (50%), Black (20%), Hispanic (15%), and Other (15%).

Materials and Procedure

The procedure and materials were the same as in Study 2a, except that the experimenter was matched by gender to each participant. Additionally, for Study 2b, we included the Positive and Negative Affect Schedule-Expanded Form (PANAS-X; Watson & Clark, 1994). Again, two raters' subjective assessments of perceived force and comfort were averaged ($r_s = .69$ and $.51$, respectively).

Results

Several 2 (male vs. female) X 2 (creatureliness vs. uniqueness) ANOVAs showed main effects of gender, $F(1, 36) = 6.09$, $p = .02$, $\eta_p^2 = .15$, and creatureliness, $F(1, 36) = 4.04$, $p = .05$, $\eta_p^2 = .10$, on number of punches--but no interaction, ($p > .40$). Males punched more ($M = 41.44$, $SD = 29.19$) than females ($M = 18.09$, $SD = 15.04$), and, consistent with Study 2a, participants primed with creatureliness punched less than those primed with human uniqueness (See Table 2 for all descriptive statistics).

Additional ANOVAs showed that creatureliness affected observer ratings of perceived force, $F(1, 36) = 8.87$, $p = .01$, $\eta_p^2 = .20$, but gender did not, and there was no interaction ($ps >$

.20). Participants primed with creatureliness were perceived as using less force than those primed with uniqueness.

For ratings of comfort, there were main effects of creatureliness, $F(1, 36) = 11.76, p < .01, \eta_p^2 = .25$, and gender, $F(1, 36) = 3.99, p < .05, \eta_p^2 = .10$, but no interaction, ($p > .80$).

Participants primed with creatureliness appeared less comfortable relative to those primed with uniqueness, and females ($M = 2.61, SD = .82$) appeared less comfortable with the task than males ($M = 3.33, SD = .80$).

There was also a main effect of creatureliness on self-reported enjoyment of the task, $F(1, 36) = 4.70, p = .04, \eta_p^2 = .12$. Participants primed with creatureliness reported enjoying the punching activity less than those primed with uniqueness. There were no effects of gender; nor was there an interaction ($ps > .66$).

Results also indicated that, similar to Study 1, participants liked the uniqueness essay more ($M = 6.83, SD = .98$) than the creatureliness essay ($M = 5.84, SD = 1.87$), $F(1, 36) = 4.50, p = .04, \eta_p^2 = .11$. No gender effects or interactions were significant ($ps > .45$).

Results revealed no significant main effects of gender or creatureliness and no interaction effects on positive or negative mood, ($ps > .30$), indicating that mood did not play a role in the effects.

Discussion

In Studies 2a and 2b, reminders of creatureliness inhibited punching behavior, which was verified both objectively (i.e., number of punches) and by subjective observers, who rated the perceived forcefulness of participants' punching and their apparent comfort with the task. Participants primed with creatureliness punched less, appeared less comfortable, and used less apparent force. Self-reported enjoyment of the task showed parallel effects, further validating the

notion that associating creatureliness with aggression undermines people's willingness to behave aggressively.

In Study 2a, there were no differences between the uniqueness and no-essay conditions, confirming the creatureliness essay (not the uniqueness essay) as the source of the effects. Study 2b included males, for whom there are less restrictive social norms related to aggression; yet, both males and females primed with creatureliness inhibited their punching, so the results cannot be attributed simply to gender norms. Further, the manner in which the task was framed (i.e., a therapeutic activity in Study 2a versus a marketing trial in Study 2b) did not alter the effects. Although participants threw fewer punches in the second study, priming creatureliness inhibited punching across both frames.

These results suggest that people become more uncomfortable engaging in physically aggressive activities when they are led to ponder humans' similarities to animals. The finding from Study 1 that acting aggressively when creaturely concerns are salient increased death thoughts suggests that these effects are due to people's existential concerns regarding the link between their animal nature and mortality. But to what extent can these existential concerns mitigate the need to adopt a defensively aggressive posture toward worldview-threatening adversaries? We turn to this question in Study 3.

Study 3

Study 3 examined if priming creatureliness concerns would inhibit support for military aggression within the context of a very real and current ethno-political conflict. This would show that the present effects generalize beyond an act associated with aggression that doesn't actually hurt anyone—hitting a punching bag. Rather, Study 3 extends to support for real-world actions

with the potential to kill thousands. Specifically, we tested the hypothesis that support for war against Iran would be undermined by priming the idea that violence is animalistic.

The use of this non-active measure of support for aggression also enabled us to rule out a possible alternative explanation for the results of Studies 2a and 2b. Goldenberg et al. (2006) found that reminders of creatureliness lead people to avoid physical sensations. Thus it could be argued that being reminded of the similarities between humans and other animals made participants want to minimize physical sensations, such as arousal resulting from exertion on the punching task, that reminded them of their creatureliness, and that they inhibited their punching to avoid these sensations. Using a non-physical self-report measure of support for military aggression made arousal avoidance untenable as an explanation for the results of Study 3.

To further reduce the plausibility of this alternative explanation, we used a different manipulation of human-animal similarity in Study 3 that focused on aggression and harm-doing but not on other physical similarities between humans and animals. Thus in Study 3 participants read a brief essay that described human violence as similar to animal violence (thus priming creatureliness *and* aggression together, as was necessary to elicit death though accessibility in Study 1), an essay that described human violence as dissimilar to animal violence (priming aggression but not creatureliness), or a neutral comparison passage. They then completed the same measure of DTA used in Study 1 and a role-playing measure designed to assess support for war. We hypothesized that reading about violence as animalistic would increase DTA (as in Study 1, attesting to the existential basis for the current effects) and decrease support for war.

Method

Participants

Ninety-three undergraduate psychology students (60 women, 33 men) at the University of Colorado at Colorado Springs participated in exchange for extra course credit. Participants ranged in age from 18 to 50 ($M = 24.48$, $SD = 7.79$).

Procedure

Participants were told they were part of a study on personality and attitudes and, in individual rooms, completed a survey packet presented in the following order.

Materials

Creatureliness-Violence Manipulation. Participants read a short passage depicting human violence as very similar to animal violence, a passage depicting human violence as very different from animal violence, or a neutral passage excerpted from Camus' *Exile in the Kingdom*, which has been used as a control passage in TMT research (e.g., Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994). Participants in the creaturely violence condition read a passage that claimed:

...Close observation of primates and other animals has made it clear that violent acts committed by humans are quite similar to violent acts committed by animals—and the motivations behind violence are really the same instincts that drive violent behavior among all animals... Violent behavior is a good example of how humans are just another animal species.

Participants in the uniquely human violence condition read a passage that claimed that:

...Close observation of primates and other animals has made it clear that violent acts committed by humans are unique acts usually with some abstract meaning motivating them as opposed to animals who just lash out without thinking about the consequences... Human acts of violence are unique.

And participants in the control passage condition read a passage stating that:

...With the lights out, the river was shining intermittently. On each side of the road, the dark masses of forest foliage stood out against the sky and seemed very near. The fine rain that had soaked the trail an hour earlier was still hovering in the warm air, intensifying the silence and immobility of this broad clearing in the virgin forest. In the black sky misty stars flickered.

Self-report measures. Participants then completed the PANAS (Watson et al., 1988) and moved onto the dependent variables. First, participants completed the same word-stem completion task used in Study 1 to assess DTA. Subsequently, participants completed another questionnaire in which they assumed the role of commander-in-chief and indicated (on 11-point scales; 1 = *strongly disagree*, 11 = *strongly agree*) how much they would support using aggressive military actions in response to international scenarios involving Iran that were threatening to American security (e.g., “If hard evidence is found that the Iranian Revolutionary Guard is training and supplying the insurgents in Iraq with weapons to use against American soldiers,” “If clear evidence indicated that Iran was developing a nuclear weapon,” “If Iran blatantly disregards the international community.”). Greater agreement that the United States should use aggressive military actions against Iran in each of the scenarios indicated higher levels of aggression (Motyl et al., 2009; see also Vail & Motyl, 2010). This scale was highly reliable ($\alpha = .91$).

Results

A one-way ANOVA (creaturely violence vs. uniquely human violence vs. neutral passage) revealed a main effect of passage on DTA, $F(2, 90) = 7.87, p < .01, \eta_p^2 = .13$, such that participants in the creaturely violence condition displayed higher levels of DTA than

participants in the uniquely human violence or the control conditions (See Table 3 for descriptive statistics).

A second ANOVA showed a main effect of passage on support of violence, $F(2, 90) = 3.08, p = .04, \eta_p^2 = .07$. Participants in the creaturely violence condition were less supportive of military violence against Iran than participants in the uniquely human violence or control conditions.

We examined whether these data met the criteria for conducting a mediation analysis. As reported above, the creaturely violence prime significantly increased DTA and reduced support for military action; however, no significant correlation between DTA and support for military action was found ($r = .05, p = .30$). Thus, the criteria for a mediational model were not met and a mediation analysis was not conducted.

Finally, we found a significant main effect of the violence passage on positive affect, $F(2, 90) = 12.46, p < .001, \eta_p^2 = .20$. The creaturely violence ($M = 3.20, SD = 0.71$) and neutral passages ($M = 3.03, SD = 0.81$), which did not differ from each other, produced greater positive affect than the uniquely human violence passage ($M = 2.24, SD = 0.95; ps < .01$). In light of these effects, the original analysis was replicated controlling for positive affect, and the main effect was not altered, $F(2, 89) = 9.27, p < .001, \eta_p^2 = .14$. Parallel analyses examining negative affect indicated no significant effects of passage ($p > .25$). There were no gender differences on affect or the dependent measures, $ps > .24$.

Discussion

Study 3 replicated the finding from Study 1 that highlighting human-animal similarities in the context of violence activates mortality-related concerns. However, whereas Study 1 found that reading a passage about the general similarities between humans and other animals increased

DTA

together with previous evidence that DTA is responsible for terror management effects, generally (Pyszczynski et al., 1999), and specifically for outcomes that reflect distancing from creatureliness (e.g., decreased interest in sex, Goldenberg et al., 2002).

General Discussion

These findings demonstrate that priming human-animal similarities makes aggression existentially concerning and leads people to inhibit both their own aggressive actions and their support for aggressive military action. In Study 1, participants primed to think of human-animal similarities showed elevated DTA after punching a punching bag. In Studies 2a and 2b, creatureliness primes reduced the frequency and apparent intensity of and comfort with punching. In Study 3, these findings were extended to endorsement of military aggression. Participants primed to think about how violence is animalistic displayed elevated DTA and decreased support for military aggression.

Our model implies that aggression was inhibited because participants were avoiding (in Studies 1-2) or trying to reduce (Study 3) an increase in DTA arising from confronting their animal (and therefore mortal) nature, we did not find evidence that DTA mediated support for aggression in Study 3. We speculated that this might be due to the assessment of DTA contaminating the creatureliness manipulation. Nonetheless, the pattern of findings in both the present studies and previous research (i.e., demonstrating that DTA mediates TMT effects, and that MS causes creatureliness-distancing effects, see Cox, Goldenberg, Arndt, & Pyszczynski, 2007; see also Schimel et al., 2007) is consistent with the idea that mortality concerns are instrumental in the aggression inhibition effect.

One potential limitation of the present studies relates to the punching-bag operationalization of aggression. Although punching a punching bag has been used as a measure

of aggression (Bosson et al., 2009; Bushman et al., 1999), it is not interpersonal. However, most of the laboratory-safe measures of interpersonal aggression (e.g. administering hot sauce, blasting others with white noise), do not involve using one's *body* to commit aggression, and therefore were not ideal for research examining the influence of creatureliness on aggressive action (most animal aggression is purely physical). Moreover, punching a punching bag has been associated with interpersonal aggression (noise blasts; Bushman et al., 1999). So, from our perspective, punching is both empirically and ecologically valid. Finally, we note that the converging findings from Study 3 (which used a face valid self-report measure of aggression) show that these effects generalize to other types of aggression, in this case supporting policies that could lead to the death of thousands of people in a real-world conflict. Thus, the finding that activating thoughts regarding the creaturely nature of human aggression reduces aggressive behavior generalizes to both one's physical actions and one's attitudes that support military aggression.

This research contributes to a growing literature demonstrating that increased hostility is not an inevitable response to existential concerns. For example, Rothschild et al. (2009) demonstrated that when religious fundamentalists are led to first contemplate compassionate religious values, they respond to death reminders by showing *decreased* intergroup hostility. These researchers explained that MS led fundamentalists, who typically hold more hostile intergroup attitudes (Altemeyer & Hunsberger, 1992), to conform to the salient central tenets of their worldviews, which in their cases involved “turning the other cheek” and “doing good to others.”

The present findings also suggest a new twist on the phenomenon of inhumanization (Bandura, 1999; Haslam, 2006; Leyens et al., 2000). Whereas previous research has documented

a ubiquitous tendency to view outgroups as less than human, and that doing so makes it easier to commit acts of violence against such groups that are normally proscribed by one's moral values, the present studies show that infrahumanizing the *act* of violence makes people less comfortable with it and less likely to engage in or support its use. This contrasts with the widespread human tendency to elevate violent acts, such as war and terrorism, to a uniquely human and even spiritual plane, by imbuing them with religious or nationalistic value (e.g., Motyl et al., 2011; Motyl, Rothschild, & Pyszczynski, 2009; Motyl, Vail, & Pyszczynski, 2009). Together with previous findings regarding the infrahumanization of people, the present findings regarding infrahumanizing behavior show that bestowing human or non-human qualities is an important step in the process through which human aggression occurs. Just as violence can be justified when the victim is dehumanized, the present findings show that violence can be reduced when the act of violence is dehumanized. And, given that people do perceive self-control and restraint as unique to humans (Haslam, 2006), this could potentially provide a fruitful approach to reducing intergroup violence.

Together, these findings provide further support for the TMT notion that people respond to existential threats by defending their culture and working to ensure its continued existence. In much of the TMT literature, this psychological process has been shown to enhance intergroup conflict (e.g., Pyszczynski et al., 2006). But the present findings suggest that it also can sometimes ameliorate conflict, supporting Becker's (1975) suggestion that, "If men kill out of animal fears, then conceivably fears can always be examined and calmed" (p. 169). In this case, highlighting the fear of being a mortal animal may be used to calm intergroup conflict.

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Footnotes

¹ Those cultures that do not so explicitly distance themselves from nature tend to view animals as supernatural beings; in these cases, creatureliness is not so threatening because animals have inner beings that transcend the physical body.

² We did not examine the impact of right-wing authoritarianism, because the current studies were conducted prior to those reported in Motyl et al. (2009).

³ In pilot testing, two male participants punched the bag overzealously, skinning their knuckles. Concerned about this, we decided to exclude men and to introduce boxing gloves to the study. After no incidents in Studies 1 and 2a, we decided to try men again, on the logic that the combination of the protective boxing gloves, a new cover story (framing the activity as a marketing trial rather than anything having to do with exercise or emotions), and using a male experimenter (to reduce the incentive to show off) would prevent zealotry and injury. Indeed, the issues observed in pilot testing did not recur.

Table 1

Descriptive statistics for Study 2a

	Creatureliness	Uniqueness	Control
Punches	37.48 (35.70) _a	77.02 (74.68) _b	95.73 (72.73) _b
Force	2.38 (.92) _a	2.90 (.83) _b	3.05 (.69) _b
Comfort	2.59 (.77) _a	3.02 (.80) _b	3.18 (.65) _b
Self-reported enjoyment	4.87 (2.71) _a	6.27 (2.09) _b	6.53 (1.83) _b

Note. SDs are in parentheses. Subscripts that differ in each row are significantly different from each other, $p < .05$.

Table 2

Descriptive statistics for Study 2b

	Creatureliness	Uniqueness
Punches	17.65 (14.27) _a	36.70 (28.47) _b
Perceived Force	2.26 (.62) _a	3.04 (.77) _b
Comfort	2.38 (.78) _a	3.35 (.71) _b
Self-reported enjoyment	5.93 (1.97) _a	7.43 (2.02) _b

Note. SDs are in parentheses. Subscripts that differ in each row are significantly different from each other, $p < .05$.

Table 3

Descriptive statistics for Study 3

	Creatureliness	Uniqueness	Control
Support for War	5.03 (2.02) _a	6.13 (1.65) _b	5.99 (1.72) _b
Death-Thought Accessibility	2.00 (1.09) _a	1.52 (.87) _b	1.13 (0.68) _b

Note. *SDs* are in parentheses. Subscripts that differ in each row are significantly different from each other, $p < .05$.

Figure Caption

Figure 1. Mean Death-Thought Accessibility as a Function of Activity and Creatureliness Prime.

