

AN ANGRY VOLCANO? REMINDERS OF DEATH AND ANTHROPOMORPHIZING NATURE

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Anthropomorphizing nature is a powerful and pervasive cognitive tendency. The present experiment examined whether existential concerns are implicated in this tendency. Nonreligious and religious Christian participants were asked to assign human characteristics to two natural objects, one benign (a tree), and one potentially threatening (a volcano). Reminders of death reduced the tendency to anthropomorphize both objects. The volcano was anthropomorphized less than the tree. These findings are examined in light of two hypotheses regarding the role of existential concerns in anthropomorphizing nature.

Why do people see faces in clouds, hear voices in the winds, and decipher human silhouettes on rocks and trees? Why did a 10-year-old grilled cheese sandwich in the likeness of the Virgin Mary fetch \$28000 in U.S. Currency on eBay, and why did a cinnamon bun resembling Mother Theresa kept in a Nashville coffee shop attract thousands of devout admirers (Svoboda, 2007, February 13)?

Anthropomorphism is the assigning of human qualities, behaviors and motivations to inanimate objects, animals, or nature (Guthrie, 1993). It is seen in all cultures and has been documented for centuries, most notably in religion and mythology. Most religions and myths conceptualize deities in human form, from Zeus and Athena, to Vishnu and Shiva, to Buddha, to Christian conceptions of God incarnated in human form. There is evidence that the devout implicitly anthropomorphize God even when this tendency runs counter to stated theological beliefs among monotheists (Barrett & Keil, 1996).

Literature, art, and entertainment are also ripe with examples of anthropomorphism (Guthrie, 1993). We see it in the humanized characters of the classic fairy tales we read to our children and in the films we watch about talking cars and haunted

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houses. In everyday life we personify our pets, give names to our boats, and yell at our computers as if they can hear us. Indeed, it seems nearly impossible to make sense of the world without using an anthropomorphic framework.

Despite its cross cultural prevalence and historical endurance, relatively little is known about the psychological foundations of anthropomorphism. While debates continue about the causes and origins of anthropomorphic tendencies (for discussions, see Guthrie, 1993; Epley, Waytz, & Cacioppo, 2007) we note that these tendencies are manifested in diverse ways, such as when believers anthropomorphize supernatural agents, or when observers perceive human features in ambiguous stimuli, or when natural scenes are assigned human characteristics. In the current research, we examine this latter manifestation—the tendency to explicitly assign psychological human qualities (such as consciousness and complex social emotions) to unambiguous natural kinds and objects, such as mountains, trees, and lakes.

RELIGIOUS CULTURE AND ANTHROPOMORPHIZING NATURE

Anthropomorphic tendencies play a central role in the religious beliefs of many indigenous cultures; for example, among the Itza Maya in Guatemala in southern Mexico (Atran et al., 1999). In these cultures characterized by animistic beliefs, the world is infused with humanlike characteristics. However, a major strain in Abrahamic religions (Christianity, Islam, and Judaism), has been to view nature as a realm separate from humans. It may follow from this that in Western religious cultures people have negative associations with nature and view nature and wilderness as a source of uncertainty and threat. Consistent with this idea, in a series of studies, Koole and Van den Berg (2005) examined such associations among Dutch participants and found that wilderness was associated with death, and not surprisingly, heightened awareness of death led to more negative evaluations of wilderness. It follows from this line of reasoning that mortality awareness may inhibit the attribution of human qualities to nature among religious groups influenced by monotheism such as Canadian Christians, but not among the nonreligious, particularly for threat-inducing natural objects such as a volcano.

TERROR MANAGEMENT AND ANTHROPOMORPHIZING NATURE

Terror Management Theory (TMT) may offer an alternative set of ideas regarding the association between mortality awareness and anthropomorphizing nature. TMT posits that we are motivated by a fear of death to construct meaningful cultural worldviews and maintain self-esteem. We create cultural structures that impart our lives with purpose and self-importance and which ultimately function to assuage death anxiety (Greenberg, Solomon, & Pyszczynski, 1997; Solomon, Greenberg, Schimel, Arndt, & Pyszczynski, 2004). While it is clear that humankind will never be able to escape physical death, we can evade death symbolically by becoming meaningful players in our cultural systems. If cultural worldview maintenance and self-esteem are effective buffers against death anxiety, then reminding people of death should strengthen both the desire to cling to their cultural values and the desire to live up to the standards of these values (i.e., self-esteem). An abundance of empirical studies support these hypotheses. Among other findings, mortality salience has been shown to lead to more positive evaluations of in-group

members and more negative evaluations of out-group members, as well as more hesitancy to violate cultural norms (Greenberg et al., 1997). Moreover, religious beliefs can also relieve death anxiety, above and beyond cultural worldview defense. Specifically, belief in supernatural agents (Norenzayan & Hansen, 2006), and belief in literal immortality play a defensive role against mortality awareness (Dechesne et al., 2003).

Of particular relevance to this research, existential threats may encourage the psychological separation between the human and non-human realms, and as a result reduce anthropomorphic attributions to nature. According to Becker (1973), cultural worldviews allow humans to rise above nature (and its associated mortality). However, there is a disquieting dilemma: while our cultural constructs serve to symbolically position humankind at the top of the nature hierarchy, our corporeal identities constantly remind us of our similarity to animals. If we are merely animals then we, too, are at the mercy of our finite bodies. An abundance of empirical studies support the hypothesis that humans engage in culturally valued meaning making behaviors as a means of elevating themselves above animals and mitigating death anxiety (Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000). Participants reminded of their mortality significantly favored an essay arguing for the uniqueness of humans over an essay arguing that humans are similar to animals (Goldenberg et al., 2001); reacted with intensified disgust on both body product and animal subscales of a disgust measure (Goldenberg et al., 2001); and downplayed the physical aspects of human sexuality (Goldenberg et al., 2000). It follows from these findings that death-aware participants would be motivated to reassert the divide between humanity and nature. One way to accomplish this is to anthropomorphize nature less, regardless of whether the natural object is threatening or benign.

We conducted an exploratory study to examine the effect of mortality salience on anthropomorphizing nature. In particular, we investigated the effect of mortality awareness on the tendency to assign human qualities such as consciousness, wisdom, and anger to inanimate natural kinds such as a tree (a benign natural object) and a volcano (a threatening natural object). We also examined whether this effect generalizes to people of varying degrees of religiosity (nonreligious participants and religious Christians). In the Discussion section, we evaluate the findings in light of the above-mentioned hypotheses regarding the relation of existential concerns to anthropomorphizing nature, specifically: (a) the religious culture hypothesis, and the (b) human-non-human divide hypothesis.

METHOD

PARTICIPANTS

Participants included in the analyses were 109 students (71 women) from the University of British Columbia who received class credit in introductory psychology. Of those, 52 participants identified themselves as Christians (Catholic, Protestant, or Orthodox) and 58 as nonreligious, agnostic, or atheist. Eight participants who did not identify their religious orientation were excluded from analyses. Non-Christian religious participants were not included in this study.

MATERIALS AND PROCEDURE

The study was presented to participants as two separate studies: Narrative Style and Emotional Impact; and Perceptions of Natural Scenes. Before exposure to the priming, participants specified their religious denomination and religious identification. To reduce suspicion, the pretest measures of religious affiliation and identification were embedded in a demographics questionnaire which asked for several demographic variables and identification with each. Specifically, participants wrote down their sex, nationality, religion, etc., and then rated on a 1 to 9 scale how important these categories were to their identity. Participants then were randomly assigned to a death prime, a dental pain control prime, or a control condition which did not receive a prime. In the mortality salience condition, participants responded to the open-ended questions: "In the space below, write a paragraph about what will happen to you when you die. Write in some detail about the feelings that the thought of your own dying arouse in you." In the dental pain condition, participants responded to the open-ended questions: "In the space below, write a paragraph about a visit to the dentist where you experience great pain due to a failure of the anesthetic. Write in some detail about the feelings that the thoughts of your dental pain arouse in you." Participants in the death and dental groups then filled out the PANAS, followed by a short distracter task. Participants in the control condition were not given any writing task, and due to an oversight, did not complete the PANAS. The dependent variables were presented as a separate questionnaire where participants were shown photographs (counter balanced) of both a volcano and a tree. All participants were asked to rate 12 different adjectives for each photograph on a 1–9 scale for how much they applied to each scene. They were told, "Rate the tree on the following adjectives, on the following 1–9 scale. Write down a number next to each adjective. Go with your first impressions." For each photograph, anthropomorphic adjectives were embedded among nonanthropomorphic adjectives. The combined anthropomorphism measure was based on the following items from the list of adjectives, for volcano: angry, conscious, and malicious ($\alpha = .63$), for tree: wise, self-confident and mindful ($\alpha = .72$). Nonanthropomorphic adjectives included items such as tall, smoky, hot, and calm. On the final page of the package, subjects filled out a questionnaire measuring belief in supernatural agents and phenomena. Specifically, participants rated their agreement (on a 1–9 likert scale) with the following statements: God/A Higher Power exists; spirits of dead people exist; telepathy (the ability to read minds exist in some people); a person's thoughts can influence the movement of physical objects (telekinesis); angels (benevolent supernatural creatures) exist; demons (evil supernatural creatures) exist. After completing the study, participants were given a course credit slip and a full debriefing form.

RESULTS

Mortality Salience Effects on Anthropomorphism. We conducted a mixed factorial ANOVA: experimental condition (3: mortality salience, control, control–pain) \times religion (nonreligious, Christian) \times stimulus type (within–group: tree, volcano). Two significant main effects emerged, one for experimental condition, $F(2, 102) = 4.28, p = .02$, and one for stimulus type, $F(1, 102) = 22.53, p = .0001$. Planned contrasts between the death condition and the combined control conditions indicated that an-

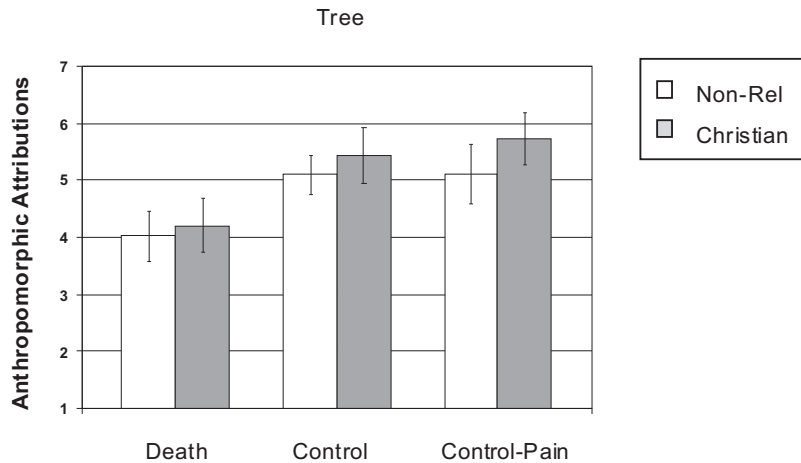


FIGURE 1. Anthropomorphic attributions to a tree as a function of mortality salience and participants' religious affiliation

thropomorphic attributions were lower when death awareness was salient, $t(105) = 2.97, p = .004$, for tree (Figure 1), and $t(105) = 1.85, p = .07$ for volcano (Figure 2). Overall, the tree ($M = 4.89$) was anthropomorphized more than the volcano ($M = 4.16$). There were no other significant main effects or interactions. The three experimental groups did not differ in the nonanthropomorphic traits, neither did the mortality salience and dental pain conditions differ in the composite positive or negative affect PANAS subscales.

Correlations Between Anthropomorphism and Supernatural Beliefs. Exploratory analyses were conducted to investigate whether anthropomorphizing nature correlated with supernatural beliefs. There were significant correlations between anthropomorphism and belief in telepathy $r(108) = .26, p = .007$ (tree), and $r(108) = .26, p = .007$ (volcano), as well as telekinesis $r(108) = .24$ (tree), and $r(108) = .24, p = .01$ (volcano). There were no significant correlations between anthropomorphism and belief in culturally familiar supernatural agents such as God, angels, and demons. Interestingly, anthropomorphism was negatively correlated with identification with one's religion among Christian participants for the tree, $r(51) = -.27, p = .05$, but not for the volcano, $r(51) = -.08, p = ns$. For nonreligious participants, neither correlation was statistically significant.

DISCUSSION

Two clear findings emerged. First, we found that death awareness reduced the tendency to assign human traits to natural objects, both benign (tree) as well as potentially threatening ones (volcano). Moreover, this effect did not interact with religious background. Second, the threatening natural object was less likely to be assigned human traits than the benign one. We discuss the implications of each finding for explanations of anthropomorphizing nature.

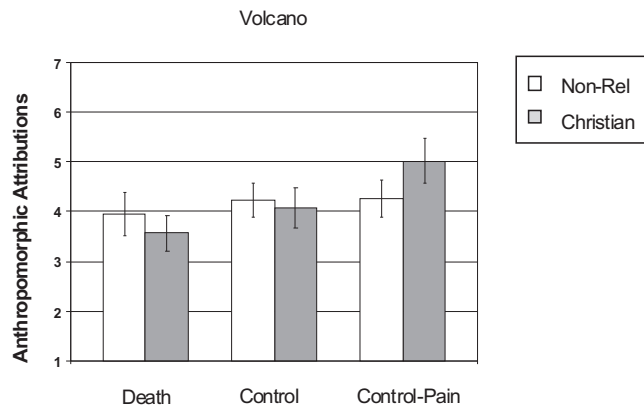


FIGURE 2. Anthropomorphic attributions to a volcano as a function of mortality salience and participants' religious affiliation

What could account for the suppression of anthropomorphic attributions under mortality salience? According to the *human–non–human divide account*, death awareness increases the motivation to distance ourselves from our mortal bodies and any related associations with the natural world (Goldenberg et al., 2000). Therefore, imbuing nature with human characteristics should be reduced under mortality salience. If Becker (1973) and Terror Management Theorists are correct, the downplaying similarities between humanity and nature and accentuating human uniqueness should lead to lower levels of anthropomorphism towards nature, and this effect should occur for both nonreligious and religious Christians alike, and for both benign and threatening natural objects. The data largely supported this account.

According to the *religious culture account*, participants exposed to an Abrahamic religious culture associate nature with threat and uncertainty, and are unwilling to attribute humanlike traits to natural objects, in particular threatening ones. Therefore, reminders of death should suppress anthropomorphic attributions to nature more for monotheists (such as Christians) than for the nonreligious, and this effect should be particularly pronounced for the threatening natural object, that is the volcano. This account was apparently not supported by the data, since the effect emerged for both stimuli and it did not interact with religious affiliation. Although Abrahamic beliefs (God, angels, demons) may be theologically inconsistent with anthropomorphizing nature, the finding that anthropomorphic attributions were unrelated to such beliefs indicates that in practice these beliefs and anthropomorphic tendencies are not mutually exclusive—they are simply unrelated phenomena. We did find that for Christians, stronger identification with religion was associated with less anthropomorphic attributions, but only with regard to the tree. This provides some evidence that Abrahamic beliefs are inconsistent with anthropomorphizing natural objects, although the lack of a similar pattern for the volcano remains problematic for the religious culture account. Nevertheless, the religious culture account may still be a compelling hypothesis that can be tested in the future, requiring broader cross cultural samples that go beyond comparison of

Christians and the nonreligious. An important limitation of this study was that, even the nonreligious participants have been exposed to the Western monotheistic cultural context. A comparison group of nonwestern participants, particularly from aboriginal cultures who espouse animistic beliefs, may provide a more convincing test for the religious culture account. We consider this possibility next.

ANTHROPOMORPHIZING NATURE ACROSS CULTURES

If severing the ties between humans and nature is necessary in order to achieve existential solace, where does it leave the cultures that may not draw such a sharp distinction? In cultures (such as aboriginal cultures in Mesoamerica, Africa, and Australia) where distinctions between nature and humans are not so rigorously defined, nature is infused with supernatural power and great spiritual value. Trees, mountains, rivers, and animals are revered and conceptualized in agentic terms rather than on the basis of their physical utility or material properties (Guthrie, 1993). Within these cultural worldviews, sources in nature do not necessarily have the same threatening connotations that they seem to carry in the Western world. This is not to say that nonwestern “nature loving” cultures do not experience the same existential conflicts, but that their methods of quelling mortality fears may be culturally tailored to suit their specific worldviews, a possibility that remains open for further research.

Although there was no independent effect of religion on anthropomorphizing there was a significant positive correlation between anthropomorphizing nature and belief in supernatural phenomena that are not widely accepted in Western Abrahamic traditions. Perhaps under mortality salience, individuals in animistic cultures would be *more* likely to anthropomorphize nature. More cross-cultural research is needed to draw firm conclusions about whether mortality salience suppresses anthropomorphism irrespective of cultural context.

Finally, the volcano was anthropomorphized less than the tree. One interpretation of this finding is that potentially threatening natural objects are anthropomorphized less than benign ones. Another possibility is that volcanoes, as nonliving things, are farther from humans in ontological distance than living trees, and as a result less likely to be assigned human characteristics. Conclusions regarding this finding are limited to the fact that only two stimuli were used which vary on a variety of dimensions. A broader set of natural objects which vary systematically on a variety of psychologically relevant dimensions is needed to reach firm conclusions about the role of valence and ontological distance in anthropomorphizing nature.

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