Mother’s Milk: An Existential Perspective on Negative Reactions to Breast-Feeding
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Drawing from an existential perspective rooted in terror management theory, four studies examined the hypothesis that breast-feeding women serve as reminders of the physical, animal nature of humanity and that such recognition is threatening in the face of one’s unalterable mortality. Study 1 demonstrated that mortality salience (MS) led to more negative reactions toward a scenario depicting a woman breast-feeding her infant in public, and in Study 2, MS decreased liking and increased physical avoidance of a potential task partner described as breast-feeding in another room. Further supporting the hypothesis that such reactions are rooted in threats associated with human creatureliness, MS in conjunction with a breast-feeding prime led to an increase in the accessibility of creaturely related cognitions (Study 3) and priming human/animal similarities (i.e., creatureliness) led to increased negativity toward a magazine cover depicting a woman breast-feeding her child (Study 4). Implications of this research are discussed.

Keywords: terror management theory; death anxiety; breast-feeding; evaluation of women; evaluation of the body

Although breast-feeding is acknowledged to be the healthiest way to feed a baby (U.S. Department of Health and Human Services, 2005) and until recently was essential to the survival of our species, this behavior appears to be contentious. In many Western societies, women who breast-feed their children in public are often frowned on or judged as indecent, even if they conceal both the breast and the activity (Forbes, Adams-Curtis, Hamm, & White, 2003; Morse, 1989; Yalom, 1997). Nursing mothers have been asked to nurse in the restroom, in the car, or leave various establishments altogether (e.g., restaurants: Feinberg, 1981; coffee shops such as Starbucks: Heldereman, 2004; museums: Harburger, 1999; businesses such as Wal-Mart: Spencer, 2005; and even obstetricians’/gynecologists’ offices: Whitely, 2001). Breast milk itself is often perceived as dirty (Morse, 1989), disgusting (Fallon & Rozin, 1983), or just plain “yucky” (Miller, 2005). Such reactions beg the question, Why is

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it that people appear threatened by this natural and healthy behavior?

In this article, we propose an existential perspective derived from terror management theory to explain such seemingly irrational reactions. We suggest that breast-feeding women serve as reminders of the physical, animal nature of humanity and such recognition is threatening in the face of one’s inevitable mortality. Therefore, although such behavior may be officially condoned and even advised, often people view it as indecent and disgusting, preferring not to see the act; keeping it out of sight helps keep our animality, and ultimately our mortality, out of mind.

**TERROR MANAGEMENT AND THE BODY**

Terror management theory (TMT; see, e.g., Greenberg, Solomon, & Pyszczynski, 1997) provides a framework for understanding how a large part of human behavior results from defensive motivations related to the awareness of death. Building on work of existential theorists (e.g., Becker, 1973), the theory suggests the juxtaposition of the biological predisposition for continued existence combined with the uniquely human awareness of the inevitability of death gives rise to the potential for extreme anxiety, or terror. This potential for terror is managed by the development and maintenance of a cultural anxiety-buffer composed of a cultural worldview and the self-esteem derived from living up to the standards of one’s worldview. According to TMT, cultural worldviews consist of humanly constructed beliefs about the nature of reality that imbue individuals with a sense of meaning, raising them from the level of mere animal. In doing so, individuals glean protection from anxiety associated with the awareness of their own mortality and gain a sense of symbolic immortality. Taken together, effective terror management thus requires faith in a meaningful conception of reality (cultural worldviews) and the belief that one is meeting or exceeding the standards of value prescribed by one’s worldview (self-esteem).

Research on TMT has supported these hypotheses by showing that reminders of mortality (mortality salience [MS]) increase efforts to maintain faith in the validity of one’s cultural worldviews and to live up to the standards it prescribes. For example, after being reminded of mortality, American students respond more negatively to individuals who threaten their worldview by criticizing the United States (e.g., Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997). Individuals also become more uncomfortable deviating from cultural norms (Greenberg, Simon, Porteus, Pyszczynski, & Solomon, 1995) and become more punitive toward other people who transgress against moral and legal norms (e.g., municipal court judges allocate an especially high bond toward an alleged prostitute; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989) when mortality is salient. Mortality salience effects have been replicated in more than 300 separate studies conducted in at least 15 different countries (see, e.g., Greenberg et al., 1997). Furthermore, these effects have been demonstrated with respect to a variety of control conditions, such as thoughts pertaining to physical pain, taking an important exam, speaking in public, social exclusion, paralysis, or uncertainty (Solomon, Greenberg, & Pyszczynski, 2004).

From this perspective, because people are motivated to adhere to cultural standards to transcend fears associated with death, many cultures are prone to regulate and offer standards for the physical body, an aspect of human existence particularly tied to death (i.e., no one denies that the body dies) and connected to our most basic animal existence. The physical body may be a proverbial slap in the face to a cultural worldview that raises people above the level of other animals (see Goldenberg, 2005; Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000). A number of empirical studies bear this out, demonstrating that the body can be threatening because of an association with existential mortality concerns. For example, Cox, Goldenberg, Pyszczynski, and Weise (in press) recently showed that confrontation with pictorial representations of bodily products and functions increased the accessibility of death-related thoughts, and Goldenberg et al. (2001) found that MS led people to respond with increased disgust toward animal and bodily products, as well as particularly negatively to an essay that made salient the physical similarities between humans and animals (i.e., creatureliness).

More direct evidence that negative reactions to the body stem from threats associated with human’s animality is provided by experiments in which creatureliness is manipulated with the aforementioned essays describing human-animal similarity. In these studies, reading the creatureliness essay (as compared to an essay that emphasized culture as distinguishing humans from animals) prior to an MS induction led people to report less interest in the physical aspects of sex (Goldenberg, Cox, Pyszczynski, Greenberg, & Solomon, 2002) and less willingness and comfort performing important health protective behaviors that involve intimate bodily confrontation (e.g., breast self-exams; Goldenberg, Arndt, Hart, & Routledge, 2005). Furthermore, negative responses to the body after MS are limited to its corporeal aspects (e.g., physical, but not romantic, aspects of sex; Goldenberg, Pyszczynski, McCoy, Greenberg, & Solomon, 1999; physical sensations of a foot massager but not aural sensations of music; Goldenberg, Hart, et al., 2005). This research supports the proposition that people’s desire to distinguish themselves from animals stems in part from...
existential mortality concerns. Although a majority of this work has focused on people’s attitudes toward the body in general, this negativity is typically directed more toward women than men.

THE FEMALE BODY

Women’s more conspicuous role in reproduction has been used as a means of devaluation, at least as far back as Plato and Aristotle. Menstruation provides a patent illustration. Aristotle believed, for example, that female inferiority was a result of menstrual blood, which he thought was inferior and less pure than men’s semen (Walker, 1997). More contemporarily, in some cultures, menstruating women are not allowed to touch food or water that others will consume (e.g., Brown, 1978), worship gods or ancestral spirits (e.g., Bennett, 1983), or come into contact with men’s hunting tools (e.g., Shostak, 1983). Although in contemporary Western societies women are not confined to menstrual huts as they are in some cultures, there is a general negativity toward menstruation. Women often are expected to hide or conceal evidence that they are menstruating by using menstrual products in disguising packages or masking the odor with “powder fresh” scents. In an experimental context, both men and women responded with disgust to a tampon (Roizin, Haidt, McCauley, Dunlop, & Ashmore, 1999) and Roberts, Goldenberg, Power, and Pyszczynski (2002) showed that men and women perceived a woman to be less competent, like her less, and physically distance from her when she dropped a tampon in contrast to a hairclip.

In contrast to the explicit negativity of reactions toward menstruation, other reproductive functions in women are on the surface responded to with favorable reactions. Take, for example, people’s attitudes toward pregnancy: In 2002, the NBC show “Friends” achieved the highest ratings in years when Rachel gave birth in primetime; in addition, Miranda’s pregnancy on HBO’s “Sex and the City” was big news and two of the most popular shows on the TLC network are “Maternity Ward” and “A Baby’s Story” (Price, 2005). However, although pregnancy often is perceived as a positive, life-affirming activity, there is some indication that people react negatively to it as well. In 1991, many Americans were outraged by the appearance of Demi Moore, naked and pregnant, on the cover of Vanity Fair and demanded that the magazine be sold on newsstands inside an opaque wrapper. Even today, society embraces pregnancy as long as vomiting, stretch marks, varicose veins, and even extended bellies are concealed in some way (Saab, 2005).

Breast-feeding, too, is on the surface highly valued (Dettwyler, 1995; Hausman, 2003; Yalom, 1997); however, similar to menstruation and even pregnancy, reactions are sometimes quite negative. In certain cultures, mother’s milk is considered polluting and inimical to man (Gregor, 1985; Tuzin, 1982). In contemporary Western societies, such as the United States, there is evidence that some people perceive breast-feeding as an indecent and animalistic act (Feinberg, 1981; Morse, 1989; Yalom, 1997), believe that breast milk is disgusting (Fallon & Rozin, 1983; Rozin & Fallon, 1980), and are revolted by the possibility of an adult ingesting human breast milk (Bramswwell, 2001). In a recent course on Women and Culture, a female undergraduate student was completely flabbergasted to learn about the biological function of women’s breasts and exclaimed with shock and disgust, “You mean women’s breasts are like a cow’s udder?” (Miller, 2005). Although empirical research is limited, it is clear that attitudes toward breast-feeding are not entirely favorable and perceptions of breast-feeding women can be derogatory.

Following other bodily oriented research derived from TMT (see Goldenberg & Roberts, 2004), we suggest that women’s reproductive behaviors can pose an existential threat due to associations with human creaturiness. Although some evidence demonstrates that people are threatened by breast-feeding (e.g., Fallon & Rozin, 1983; Rozin & Fallon, 1980; also see Bramswell, 2001; Feinberg, 1981; Morse, 1989; Stearns, 1999; Yalom, 1997, for commentaries), this perspective offers unique insight into (and a first experimental test of) why this behavior may be so disconcerting. Although the benefits of breast-feeding are well established, and many people consider the behavior admirable, there are physical aspects to this behavior that, similar to menstruation, women are expected to conceal (e.g., covering the breast and the expression of milk). According to the present analysis, such societal pressures for concealment result, in part, from the glimpse into the animality of our existence that breast-feeding behavior threatens to unveil.

It follows from this analysis that if breast-feeding is perceived as a creaturely body function associated with negative attitudes, people should respond to reminders of death with more negativity toward breast-feeding women. The first two studies thus examined the effects of M5 on peoples’ reactions toward a public breast-feeding scenario (Study 1) as well as to a potential task partner who they believed was breast-feeding (or bottle-feeding) in another room (Study 2). To more directly implicate the role of creatureliness in these reactions, Study 3 assessed the accessibility of creaturely related cognitions following reminders of death and the breast-feeding scenario of Study 2. Study 4 tested for causal effects of concerns about creatureliness on reactions toward breast-feeding by exposing participants to an essay emphasizing the animal side of human nature prior to evaluating a stimulus depicting a woman who was or was not breast-feeding.
STUDY 1

Following a manipulation in which people were primed with thoughts of their mortality or a control topic, people were asked to evaluate a series of cultural transgressions, some of which have been used in previous terror management research (Florian & Mikulincer, 1997). Based on prior work, we expected MS to increase negatively to moral and cultural violations. But in this study, we also made the novel prediction that breast-feeding in public would pose a threat under conditions of MS by making salient human creatureliness. Thus, we hypothesized that MS compared to a control condition would lead to harsher judgments toward a woman who breast-feeds in public, much like the moral transgressions.

Method

Participants. Students (N = 62, 35 women) were recruited from introductory psychology classes and participated in exchange for course credit. Ages ranged between 18 and 22 years (M = 18.58, SD = .96).

Materials and procedure. Participants completed packet described as a personality and attitudes assessment in a laboratory setting. After obtaining informed consent, participants were instructed to work through the packets in the order the materials were presented and were informed that their responses would be anonymous and confidential. All packets were identical in content except for the MS manipulation. In all studies, the questionnaire packets were placed in random order prior to the experimental sessions by another assistant and thus the experimenters were blind to conditions. Upon completion, the experimenter debriefed the participants as to the true nature of the study. The content and order of the questionnaire packets are briefly described below.

MS manipulation. Following a series of personality fillers, participants completed the MS manipulation. Consistent with previous research (see Rosenblatt et al., 1989), MS was manipulated by having participants answer two open-ended questions about their thoughts and feelings associated with death (e.g., “Briefly describe the emotions that the thought of your own death arouse 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”) versus parallel questions about public speaking in the control condition. Public speaking has been used in previous TMT research (as have a range of other aversive topics; see, e.g., Solomon et al., 2004) and was employed to control for the salience of general negativity. The task was described as an innovative personality assessment and participants were asked to respond with their first, gut-level response.

Because MS effects occur when thoughts of death are highly accessible but outside of conscious awareness (e.g., Arndt et al., 1997), participants were asked to complete the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) and a word search task to provide a delay. The word search puzzle was a 10 × 10 matrix of letters with instructions asking people to search and circle 10 neutral words (e.g., book, movie). The PANAS was used in subsequent analyses to determine if MS influenced people’s mood, although previous research indicates that it typically does not (see, e.g., Greenberg et al., 1997).

Reactions to transgressions. The dependent measure consisted of a series of five vignettes, four of which were designed to replicate previous findings. Two were clearly moral violations (i.e., an organizer running off with students’ tuition money, a burglar destroying an artist’s life masterpiece; Florian & Mikulincer, 1997) and two attacked an American worldview (i.e., an immigrant farm laborer criticizing the United States, students burning the American flag in protest). The fifth vignette, in contrast, was created to measure people’s reactions toward a woman breast-feeding in public. Specifically, it read as follows:

A woman brought her 2-month-old newborn to meet friends for lunch at an upscale restaurant. Her baby became fussy and needed to be fed. She went ahead and began breast-feeding her baby at the restaurant table. During this time, an employee approached the woman and asked her to cover up or breast-feed her baby in the restroom. “My child is hungry and I have every right to breast-feed in public,” she continues, “I wouldn’t ask you to eat your dinner in the bathroom.”

The breast-feeding vignette always came first so that reading about the other transgressions would not influence people’s responses to our dependent measure of primary interest.

Participants were instructed to read the scenarios and answer each question with their first, natural response. For each scenario, participants were asked to indicate, “How severe was this wrongdoing?” and “How heavily should this person be punished?” All responses were made on a 7-point scale ranging from 1 (not at all) to 7 (very). To assess attitudes toward breast-feeding, the average response was taken for the two items related to the breast-feeding scenario (α = .80), whereas the remaining items (i.e., the questions for the four other transgression scenarios) were averaged together to make a transgressions’ score (α = .77).
At the end of the packet, participants were asked to report their reactions toward the study, along with their age and gender.

Results and Discussion

PANAS. To examine whether the MS manipulation had an effect on people’s mood, separate independent t tests were performed on the positive and negative mood subscales of the PANAS. Consistent with previous research, the results revealed no significant difference between death and public speaking conditions on either subscale, ts < 1.

Cultural transgressions. An independent t test examined the effects of MS on the mean judgment of the four non-breast-feeding cultural transgressions. Replicating previous terror management research (Florian & Mikulincer, 1997), people in the death condition (n = 31, M = 5.05, SD = .98) appraised the scenarios as more severe and proposed more severe judgments compared to the public speaking condition (n = 31, M = 4.59, SD = .78), t(60) = 2.02, p = .05.

Breast-feeding transgression. To test the hypothesis that reminders of mortality would provoke a more negative reaction to a breast-feeding woman, an independent t test was performed on the score for the breast-feeding transgression. Consistent with the hypothesis, the results showed a significant difference between conditions, t(60) = 2.72, p = .009, with people in the death condition (n = 31, M = 2.98, SD = 1.35) responding more harshly to the scenario than those in the control condition (n = 31, M = 2.13, SD = 1.12).

The present findings provide initial support for the relevance of concerns about mortality for understanding negative reactions to breast-feeding. Not only did we replicate previous terror management research in which MS led participants to make more severe judgments against cultural transgressions that challenged various aspects of participants’ worldviews but the present study revealed that MS led to more negative reactions to a woman breast-feeding in public. Specifically, following MS, participants were more likely to perceive a public breast-feeding scenario as a more severe wrongdoing and award a harsher penalty for such behavior, compared to the control condition.

In this study, however, breast-feeding was paired with other transgressions and the behavior was performed in a fine-dining establishment. Thus, in some ways, the deck was stacked such that it may have been especially likely that breast-feeding would be perceived as a deviant behavior. The question therefore remains as to whether the awareness of death would influence reactions to a woman breast-feeding her baby in a more discreet context, as well as whether reactions to the imagined, hypothetical scenario would hold up in a more ecologically valid and behaviorally oriented situation.

STUDY 2

Study 2 assessed reactions to a woman who had just breast-fed (or bottle-fed) her baby in private, thereby reducing the tendency to see the behavior as norm breaking. In addition, rather than ask specifically about reactions to the breast-feeding act, reactions to the woman who had engaged in the behavior were assessed. Thus, similar to the first study, participants were randomly assigned to write about death or, in this case, the control topic of dental pain to provide another elicitation of generally aversive cognition. However, in contrast to Study 1, participants were informed that they would be performing an interaction task with another person and that their task partner was in the adjacent room breast-feeding or giving her baby a bottle. We measured liking for the participants’ potential partner as well as the participants’ propensity to physical distance from the partner. We hypothesized that if people experience negative feelings in response to breast-feeding, they should maintain greater physical distance between themselves and the person who breast-fed.

Method

Participants. Participants were 82 women and 47 men recruited from introductory psychology courses at two universities. Ages ranged between 17 to 52 years (M = 20.50, SD = 4.90). Participants were given credit for their participation.

Materials and procedure. Participants were recruited to take part in a study titled Personality and Person Perception. Upon arrival, participants were told that researchers were interested in personalities of college students and how people form opinions of other people. The experimenter informed participants that they would complete a variety of personality forms as well as converse with another person, a partner, about a topic (e.g., life as a college student) at a later time. Participants were tested on an individual basis in a laboratory setting and were thoroughly debriefed about the nature of the study upon its completion. The content and order of the materials are described below.

MS manipulation. Following a series of personality fillers, participants answered the same open-ended questions about death described in Study 1. The control
condition asked parallel questions about experiencing dental pain, thus providing a different aversive control group.

**Breast-feeding prime.** Upon completion of the first questionnaire packet, participants were informed that their partner brought a baby to the experiment and was seated next door. Because their partner arrived to the session early, participants were told that she was using the extra time to breast-feed her baby or, in the control condition, give her baby a bottle. In actuality, the adjacent room was empty but the experimenter entered and exited the room as if a person was present.

**Partner evaluation task.** Prior to the interaction task, participants were asked to complete a personality profile, which they would exchange with their partner. The personality profile contained several demographic questions (e.g., age, major), asked participants to briefly describe their hobbies and interests, and had them explain what activities they participated in last summer. Not only did the profile lend credence to the cover story of the experiment (person perception) but it also provided a brief delay between the MS manipulation and dependent variables. Once the participants completed the personality profile about themselves, the experimenter brought in their partner’s personality profile, which they were asked to read and evaluate on a variety of dimensions. All participants, regardless of condition, were given the same personality profile created by the researchers to describe their partner (see the appendix). Following previous research (Roberts et al., 2002), participants were asked a series of questions designed to measure their partner’s likeableness. These items included, “How much would you like to work with your partner?” “How friendly is your partner?” “How much do you look forward to completing the task with your partner?” “How much do you think you would like your partner?” “What is the likelihood that you could be friends with this person outside of school?” and “How similar are you to your partner?” Participants were told to answer each question with their partner’s exact response and that their partner would never know you could be friends with this person outside of school.

**Physical distancing.** A 2 (MS: death vs. dental pain) × 2 (condition: breast-feeding vs. bottle-feeding) ANOVA going to check on his or her partner and asked the participant to set up the folding chairs for the task. When the experimenter returned, the participant was informed that his or her partner was not ready and asked to return to their original lab room to complete additional questionnaires. Once the participant left the room, the experimenter measured the distance (in inches) between the two chairs (see Macrae, Bodenhausen, Milne, & Jetten, 1994; Roberts et al., 2002, for similar procedures).

The last questionnaire assessed people’s reactions to the study as well as demographic information including age and gender.

### Results and Discussion

**Liking scores.** A 2 (MS: death vs. dental pain) × 2 (condition: breast-feeding vs. bottle-feeding) between-subjects ANOVA was performed on the mean likeability scores. The results revealed a main effect for condition, $F(1,125) = 11.38, p = .001$, with bottle-feeding mothers ($M = 6.77, SD = .97$) evaluated more positively than breast-feeding mothers ($M = 6.17, SD = 1.02$). There was also a marginally significant effect for MS, $F(1,125) = 3.42, p = .07$, showing that following reminders of death, people evaluated their partner less favorably ($M = 6.30, SD = 1.13$) compared to the dental pain condition ($M = 6.62, SD = .90$). These effects, however, were qualified by a significant interaction between MS and breast-feeding condition, $F(1,125) = 3.78, p = .05$ (see Table 1). Simple main effect analyses showed that within the breast-feeding condition, participants evaluated their partner less favorably when primed with death, $F(1,125) = 7.63, p = .007$, but that MS had no effect on evaluations of the bottle-feeding mother, $F < 1$. The results also revealed that within the MS condition, people evaluated the breast-feeding mother more negatively than the bottle-feeding mother, $F(1,125) = 15.01, p < .001$, but that there was no difference in these evaluations in the control condition, $F < 1$.

### Table 1: The Effect of MS and Breast-Feeding Primes on Partner Likeability Scores (Study 2)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Breast-Feeding</th>
<th>Bottle-Feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Mortality salience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td>5.86</td>
<td>1.05</td>
</tr>
<tr>
<td>Dental pain</td>
<td>6.51</td>
<td>.88</td>
</tr>
</tbody>
</table>

NOTE: Higher scores reflect increased positivity toward a potential task partner.
performed on the distance measured between the two chairs revealed no main effects, \( F(1, 111) \leq 2.87, p \geq .10 \), but the predicted interaction between MS and breast-feeding condition, \( F(1, 111) = 4.16, p = .04 \) (see Table 2). Tests of simple main effects revealed that within the death condition, participants distanced themselves more from a breast-feeding than a bottle-feeding partner, \( F(1, 111) = 4.84, p = .03 \). The results also showed a significant difference between death and dental pain conditions within the breast-feeding prime, \( F(1, 111) = 7.70, p = .006 \), with participants placing the chairs further apart in the death condition. The remaining comparisons were not significant, \( F_s < 1 \).

The present study showed that participants exhibited negative reactions toward a breast-feeding woman following reminders of death. Specifically, when a purported female task partner had been breast-feeding, this woman was perceived as less likeable and participants physically avoided her in comparison to a woman described as giving her baby a bottle. Consistent with predictions, these findings show that thoughts of death intensify people’s negative reactions toward a breast-feeding woman. The present results significantly advance the findings from Study 1 because they were obtained with both evaluations of an actual (or so participants believed) partner as well as participants’ overt behavior toward that (purported) partner.

Although the current perspective suggests that the operative agent of threat is the potential for breast-feeding to make women’s creatureliness salient, it is possible to explain these results in terms of any transgression. That is, MS has been found to create more negativity toward those who commit cultural transgressions (see, e.g., Greenberg et al., 1997, for a review); thus, to the extent that breast-feeding can be viewed as such a transgression, negative responses could be viewed as another such manifestation. Yet, the results of Study 2 cast doubt on this interpretation—if participants were merely responding to the counternormative behavior of breast-feeding, then one would expect MS to result in increased negativity and distancing from the bottle-feeding mother as well (who also brought her baby to a psychology experiment). This was not the case, however. This suggests that negative reactions to breast-feeding in Studies 1 and 2 can be explained by creaturely concerns and not reactions to social and moral transgressions.

Nonetheless, to make a stronger case that breast-feeding is threatening (and a transgression) due to concerns about human creatureliness, it would be helpful to more clearly demonstrate the role that creatureliness concerns play in reactions to breast-feeding. According to the present analysis, the juxtaposition of mortality reminders and confrontation with a breast-feeding woman evokes concerns about creatureliness, and these creatureliness concerns in turn motivate a pejorative view of breast-feeding. Two remaining experiments sought to assess this analysis by examining the accessibility of creaturely related cognitions as a function of thinking about death and breast-feeding and by testing for a direct causal effect of priming human creatureliness on reactions to stimuli depicting breast-feeding or not. Thus, the remaining studies have the potential to offer critical insights into the relationship between mortality and breast-feeding concerns by directly implicating the role of creaturely cognitions in these effects.

### TABLE 2: Mean Chair Distancing Scores as a Function of MS and Breast-Feeding Primes (Study 2)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Breast-Feeding</th>
<th>Bottle-Feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>M SD n</td>
<td>M SD n</td>
<td></td>
</tr>
<tr>
<td>Mortality salience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td>38.06 10.76 32</td>
<td>32.58 9.72 26</td>
</tr>
<tr>
<td>Dental pain</td>
<td>31.44 9.36 31</td>
<td>33.19 7.44 26</td>
</tr>
</tbody>
</table>

NOTE: Higher scores indicate increased physical distance (in inches) from one’s partner.

### STUDY 3

Study 3 was designed to examine whether confrontation with breast-feeding in conjunction with MS heightens the accessibility of creaturely related thoughts. As in Study 2, participants were randomly assigned to write about death or dental pain and were exposed to the same breast-feeding and bottle-feeding manipulation. This time, however, the dependent variable consisted of a word-stem completion task to measure the accessibility of creaturely related thoughts. We expected that the breast-feeding prime would interact with MS to heighten the accessibility of creaturely related thoughts because our perspective implies that breast-feeding is threatening due to concerns with one’s animal nature and that reminders of death intensify these effects.

**Participants.** Forty-seven introductory psychology students (19 women, 28 men) completed the study in exchange for course credit. Ages ranged between 18 and 23 years (\( M = 18.81, SD = 1.15 \)).

**Materials and procedure.** The materials and procedure were similar to those described in Study 2. However, in this study, after participants were told that their partner was breast-feeding or bottle-feeding, they were asked to complete a word-stem completion task designed to measure the accessibility of creaturely related thoughts.
thoughts. This word fragment task, based on those used by other researchers to assess the accessibility of particular constructs (e.g., Arndt et al., 1997; Bassili & Smith, 1986; Gilbert & Hixon, 1991; Steele & Aronson, 1995; Tulving, Schacter, & Stark, 1982), consisted of 25 word fragments, 6 of which could be completed as neutral or creaturely related words. Participants were instructed to complete the measure by filling letters in blanks to create words and to fill one letter per blank with some words being plural. Examples of the neutral words include CA__M (cars), CL__K (clock), and FL__W__R (flower). The critical creaturely completions were CREAT__E (creature or creative), __CUS (mucus or focus), __MAL (animal or formal), BL__D (blood/bleed or blind), and SAL__MAL (saliva vs. salute). Scores consisted of the total number of creaturely completions.

Results and Discussion

A 2 (MS: death vs. dental pain) × 2 (condition: breast-feeding vs. bottle-feeding) between-subjects ANOVA was conducted on the number of creaturely related words. The results revealed a significant two-way interaction between MS and breast-feeding conditions, $F(1, 43) = 4.05, p = .05$ (see Table 3); none of the main effects were significant, $Fs(1, 43) \leq 2.17, ps = .15$. Simple main effect analyses revealed a significant difference between breast-feeding participants within the death condition, $F(1, 43) = 6.22, p = .02$, with breast-feeding primes eliciting a higher number of creaturely related thoughts.

There was also a significant difference between death and dental pain conditions within the breast-feeding prime, $F(1, 43) = 6.22, p = .02$, with death-primed participants exhibiting more creaturely thoughts. The remaining comparisons were nonsignificant, $Fs < 1$. Additional analyses revealed that the MS and breast-feeding manipulations did not affect the number of neutral and total words completed, $Fs(1, 43) \leq 1.81, ps \geq .19$.

In accord with predictions, participants who were primed with thoughts of death and told that their partner was breast-feeding evidenced higher accessibility of creaturely related cognitions compared to the other conditions. These findings provide important insight into the relationship between creaturely and death-related concerns, especially as manifested in reactions to breast-feeding. Specifically, building on the results of Study 2, the present analyses suggest that people may exhibit increased negativity and physically avoid a breast-feeding woman because MS and breast-feeding primes combine to increase the accessibility of creaturely related cognitions. These two dependent measures (i.e., evaluation/avoidance of a breast-feeding woman and creaturely accessibility) were assessed in two separate studies because, as with previous TMT research (e.g., Arndt et al., 1997), we were reluctant to measure creaturely accessibility in the same study with other evaluative measures out of concern that assessing accessibility would interfere with evaluative processes that would otherwise manifest.

Although these results provide the first empirical assessment of creaturely cognitions following threats of physicality and mortality, they say little about whether creaturely cognitions play a causal role in pejorative responses to breast-feeding. Study 4 was designed to test the connection between breast-feeding and creaturely concerns and, in doing so, offer converging evidence that breast-feeding is threatening because of its creaturely nature.

### STUDY 4

Recent evidence suggests that negative reactions toward women’s biological role in reproduction are associated with the physical, animal nature of humanity. Specifically, Goldenberg, Cox, Arndt, and Goplen (2006) found that after reading an essay emphasizing human similarity to other animals, participants responded with increased negativity toward a pregnant, but not a nonpregnant, image of Demi Moore. In the present study, following Goldenberg et al., participants were randomly assigned to read an essay that emphasized human/animal similarities or a neutral essay that commented on registering for college classes (see, e.g., Goldenberg et al., 2001, for similar materials and procedures). In addition, participants received two Redbook magazine covers: one depicting a woman breast-feeding her child and one depicting the same woman with child but not breast-feeding. The dependent variables consisted of people’s evaluations of the two magazine covers. If breast-feeding is threatening due to concerns associated with one’s animal nature, then participants should evaluate the breast-feeding picture more negatively following the creaturely, but not neutral, essay.

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**TABLE 3:** Creatively Accessibility Scores as a Function of MS and Breast-Feeding Primes (Study 3)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Breast-Feeding</th>
<th>Bottle-Feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Mortality salience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td>2.25</td>
<td>1.06</td>
</tr>
<tr>
<td>Dental pain</td>
<td>1.42</td>
<td>.51</td>
</tr>
</tbody>
</table>

NOTE: Higher scores reflect higher accessibility of creaturely related thoughts.
Method

Participants. Forty-seven undergraduate psychology students (30 women, 15 men; 2 people did not report their demographic information but were included in the final analysis) participated as part of a class demonstration. Ages ranged between 18 and 23 years (M = 20.47, SD = 1.47).

Materials and procedure. Participants completed a packet of materials described as a “personality, attitudes, and opinions” assessment in a classroom setting. Participants were informed that their responses were completely anonymous and confidential and were instructed to work through the packets in the order presented. The content and order of the questionnaire packets are briefly described below.

Creatureliness manipulation. Participants were randomly assigned to read one of two essays. The creaturely essay emphasized the biological similarities between humans and animals and stated, “The boundary between humans and animals is not as great as most people think . . . we’re all made up of skin, blood, organs, and bones . . . what appears to be the results of complex thought and free will is really just the result of our biological programming and simple learning experiences, just like all other animals.

The neutral essay, on the other hand, described the process of registering for college classes. It stated,

One aspect of taking classes in the social sciences that makes it really difficult is getting into the classes you want to take . . . they tend to fill up really quickly . . . you also have to register so far in advance that it can be hard to know which classes you want to take and by the time you figure it out, they are already full.

The essays were described as being written by a senior honor’s student at a local university. Variations of these essays have been used in previous research (e.g., Goldenberg, Arndt, et al., 2005; Goldenberg et al., 2001).

Mood. Participants were then asked to complete a 20-item measure of positive and negative affect (PANAS; Watson et al., 1988). The PANAS was included to confirm that effects were specific to the creatureliness manipulation rather than more general negative or positive affect. Scale reliabilities for the subscales were high (α for positive affect = .91, negative affect = .83).

Magazine evaluations. To assess people’s attitudes toward breast-feeding, participants were asked to look over and evaluate two magazine covers. Specifically, participants were told via written instructions, “On the following pages are a series of magazine covers. Please look at each cover and turn the page and answer the questions that follow.” The breast-feeding picture consisted of a newsstand cover of Redbook magazine (December 1997), which depicted actor Pierce Brosnan watching his girlfriend, Keely Shaye Smith, nursing their son. The non-breast-feeding picture was a second Redbook cover (a subscription cover; December 1997) of Brosnan, Smith, and their son depicted in a family-style portrait. The two pictures were counterbalanced to eliminate any order effects (copies of the pictures were obtained on the Internet at http://members.aol.com/mrslsteele/redcov.htm). Following each picture, participants were presented with eight questions asking whether they found the magazine cover “offensive,” “pleasing,” “disgusting,” “beautiful,” “in poor taste,” and “tastefully done.” Two more items read, “Overall, how favorable is your reaction to this magazine cover?” and “In general, do you disapprove of this magazine cover?” All items were rated on a 9-point scale ranging from 1 (not at all) to 9 (very much so). The positive items were reversed scored, and all items were averaged to form a general measure of negativity (α for the breast-feeding picture = .91, non-breast-feeding picture = .84).

Results and Discussion

A 2 (essay: creaturely vs. neutral) × 2 (magazine cover: breast-feeding vs. non-breast-feeding) mixed-design ANOVA, with the second factor within subjects, was performed on the magazine evaluation scores. The results revealed a significant main effect for magazine, F(1, 45) = 68.24, p < .001, with participants evaluating the breast-feeding cover (M = 4.77, SD = 1.74) more negatively than the non-breast-feeding cover (M = 2.85, SD = 1.11). There was no main effect of essay, F(1, 45) = 1.37, p = .25. The results did reveal the predicted interaction between essay and magazine cover, F(1, 45) = 7.39, p = .009 (see Table 4). Simple main effects analyses revealed that participants evaluated the breast-feeding cover more negatively after the creatureliness essay compared to the neutral essay, F(1, 45) = 4.50, p = .04. Effects of the creatureliness prime on reactions to the non-breast-feeding magazine cover, in contrast, were in the opposite direction and did not approach significance, F < 1. Looked at differently, there were also significant effects of magazine cover within both essay conditions: creaturely essay, F(1, 22) = 40.83, p < .001; neutral essay, F(1, 23) = 27.37, p < .001. In both cases, participants evaluated the breast-feeding cover more negatively than the non-breast-feeding cover, although as shown by the aforementioned comparisons, this effect was larger in the
cultural essay condition. Additional analyses showed that these effects were not moderated by order of the tasks, $F_{s} \leq 1.26$, $p_{s} \geq .27$. In addition, including negative (and positive) affect as a covariate did not influence the significant two-way interaction between essay and magazine cover on the evaluation scores.

Study 4 demonstrated that the salience of human creatureliness negatively affects people’s evaluation of a breast-feeding woman. Moreover, this effect was specific to reactions to breast-feeding; the same woman posing with, but not breast-feeding, her infant did not inspire more negative reactions as a function of creatureliness. These findings provide direct evidence that the awareness of human creatureliness can play a causal role in negative reactions to breast-feeding. Although MS was not primed in this study, the findings demonstrate a connection between breast-feeding and concerns about creatureliness, which given the results of Study 3, suggest that MS may exert its effect on reactions to breast-feeding due to this association.

**GENERAL DISCUSSION**

Taken together, the present studies provide support for the idea that ambivalent reactions to breast-feeding occur, at least in part, because of existential concerns associated with the potential for breast-feeding to make salient human creatureliness. In two studies, the salience of mortality concerns enhanced negative reactions to breast-feeding. In Study 1, after being reminded of death, breast-feeding in public was rated as a more severe transgression, and in the second study, after MS, a woman who breast-fed her baby in private was liked less and physically distanced from compared to a woman who bottle-fed her baby. Studies 3 and 4 provided critical evidence that creaturely concerns are instrumental in such reactions. In particular, a third experiment demonstrated that priming breast-feeding in conjunction with mortality rendered thoughts associated with human creatureliness more accessible, and a fourth study provided evidence for a causal role of creaturely concerns on breast-feeding reactions by showing that people expressed increased negativity toward a picture of a breast-feeding woman (but not the same woman not breast-feeding) after reading an essay that primed human/animal similarities.

The finding that breast-feeding in conjunction with MS activated thoughts about physicality is an important missing link in the body of work on TMT and ambivalence toward the physical body. Although there is evidence that the effects of MS on negative reactions to the body are specific to aspects that are physical in nature, the mechanism by which the threat occurs had yet to be empirically examined. Study 3 provides the first direct evidence that negative reactions to, in this case, breast-feeding may be due to the behavior’s potential to remind individuals of the physical, animal nature of humanity. Future research should be designed so that mediation by such cognitions can be directly assessed. Given methodological concerns about the simultaneous assessment of accessibility and evaluative measures (see, e.g., Arndt et al., 1997), very subtle or implicit measures may be most useful in pursuit of this idea. Although this research did not directly test mediation by creaturely cognitions, Study 4’s finding that such cognitions can have a causal impact on breast-feeding (and pregnancy) reactions provides convergent support for this model.

These studies are also the first to empirically demonstrate a direct role of mortality concerns on reactions to bodily functions specifically associated with women. Goldenberg et al.’s (2006) study examining reactions to the pregnant Demi Moore did not manipulate MS and thus only tested one aspect of the model. Together though, these two lines of research provide reasonably compelling evidence that women’s reproductive characteristics are threatening due to existential concerns (see Goldenberg & Roberts, 2004). Furthermore, the current analysis is consistent with the position (e.g., de Beauvoir, 1952; Tuana, 1993) that women’s reproductive responsibilities may play a role in the sometimes derogatory attitudes people hold toward women. Because women play a more obvious role in reproduction—being the ones who menstruate, gestate, and lactate—an existential perspective informed by TMT suggests that women may be especially vulnerable to negative reactions associated with their physicality. Of course, in this research we were not able to explicitly pit reactions to women against reactions to men because we were hard pressed to come up with a comparable male behavior.

It is interesting that in each study there were no gender differences in reactions to the breast-feeding women. We did not have any clear hypotheses regarding gender in this work. Previous research examining reactions to menstruation (albeit not at a function of MS)

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**TABLE 4:** The Effects of Creaturely and Neutral Essay Primes on Magazine Evaluation Scores (Study 4)

<table>
<thead>
<tr>
<th>Essay condition</th>
<th>Breast-Feeding</th>
<th>Non-Breast-Feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Creaturely</td>
<td>5.30</td>
<td>1.86</td>
</tr>
<tr>
<td>Neutral</td>
<td>4.27</td>
<td>1.48</td>
</tr>
</tbody>
</table>

NOTE: Higher scores reflect increased negativity toward the magazine cover.

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also found negative reaction among men and women alike (Roberts et al., 2002), and Goldenberg et al. (2006) found no gender differences in reactions to pregnancy as a function of priming creatureliness. In this research, we considered that, on one hand, women may be especially threatened because breast-feeding should make salient their own physical, animal nature. On the other hand, it also makes sense that men, who are sexually aroused by women’s breasts, may be especially threatened by viewing the objects of their sexual desire engaged in this alternative, and blatantly biological, activity (see Landau et al., 2006). Thus, it is not surprising that the present results revealed no effects for gender.

Although the current research suggests that breast-feeding is threatening because of its connection to physicality and death, there are limitations associated with the relatively small and homogeneous samples of U.S. college students enlisted in this research. In fact, unlike other female reproductive processes that are viewed predominately negatively (e.g., menstruation), views on breast milk and breast-feeding are quite variable. Perhaps women who have breast-fed their own children would, rather than be threatened by breast-feeding when mortality is salient, have positive reactions to the behavior due to associations between breast-feeding and life-enhancing nourishment or psychological bonds with their own children. Such variability also appears cross-culturally. Among several Hindu societies, mothers’ milk is said to be pure, life giving, holy, and worshipped as a gift from the gods (Gilmore, 2001), and in many other cultures, women walk around bare-breasted feeding their infants (Dettwyler, 1995). Clearly, some of the most obvious ambivalence toward breast-feeding is observed in Western societies.

There are a few explanations that may compliment TMT to illuminate why reactions to breast-feeding may be more negative in Western cultures. One explanation may be that there are cultural variations in the need to distance from animals. Whereas most industrialized nations draw sharp distinctions between humans and other animals, many aboriginal cultures seem to live in closer harmony with nature (Becker, 1973). However, when cultures do embrace nature, they also tend to imbue nature with supernatural power and significance, thereby stripping nature of its more threatening mortality-related qualities (Goldenberg et al., 2000). For example, in many Hindu cultures, milk and cows are sacred and thus woman’s association with them provides her with a counterbalancing “aura of holiness” (Gilmore, 2001, p. 212). Furthermore, the difference between Western and non-Western attitudes toward breast-feeding also may be attributed to the wide availability of alternative, scientifically developed formulas for feeding babies in Western cultures that may provide the opportunity to deny the similarity of humans to animals by choosing what could be perceived as a more civilized approach (see Bramswell, 2001).

In addition, the juxtaposition of biological and sexual facets of the breast also may create a situation in which Westerners are particularly threatened. In Western cultures, the United States in particular, breasts are highly sexualized and taboos regulate their appropriate exposure (i.e., cleavage is appropriate but exposed nipples cross the line, as the uproar about Janet Jackson’s 2005 Super Bowl halftime show attests). For women, similar to hair and make-up, breasts are displayed as part of their appearance and are sometimes “improved” through special garments and surgeries, and for men, breasts can play an important role in attraction to women (Stearns, 1999). According to many theorists (e.g., Bramswell, 2001; Stearns, 1999; Van Esterik, 1994; Yalom, 1997), breast-feeding challenges the view of breasts as sexual objects, and to the extent that a culture imbues breast with sexuality, we would predict especially controversial reactions to breast-feeding.

Of note, the relationship between sexualization of the breast and ambivalence toward breast-feeding may not only have one direction of causality. Goldenberg and Roberts (2004) recently argued that emphasis on women’s sexuality serves as a defense against the creaturely, threatening aspects of their animal nature by transforming the physical body into a cultural symbol. In support of the reasoning, Roberts et al. (2002) found that participants were more likely to rate women’s physical attractiveness as especially important when they were exposed to a female confederate who inadvertently dropped a tampon. Research also has demonstrated that MS led people to objectify women (Grabe, Routledge, Cook, Andersen, & Arndt, 2003), and reminders of death have been found to elicit appearance-striving behaviors among women (Routledge, Arndt, & Goldenberg, 2004). In this light, sexualization of the breast may not only intensify negative reactions to breast-feeding but negative reactions to breast-feeding may play a role in sexualization, or objectification, of the breast.

On a related note, it is difficult to determine how much of people’s reactions to breast-feeding stems from problems specific to breast-feeding and how much stems from threats associated with nudity of the breast. However, in Studies 2 and 3, participants were not at risk for seeing the woman’s breast because she was to be finished breast-feeding before they were to interact with her. In addition, the findings of increased creatureliness accessibility are more in line with an explanation based on threats associated with the physicality, rather than the nudity, of breast-feeding.

The present research and theory highlights some possible avenues to potentially offset negative attitudes and
behaviors toward breast-feeding women. First, to the extent that breast-feeding is threatening because it makes salient creaturely and mortality-related concerns, one strategy for future research is to minimize the self-threat underlying such negativity. At the broadest level, if people were more able to accept their mortality (e.g., taking death awareness courses), they could better accept their corporeality and feel less threatened by creaturely reminders. Second, terror management research suggests that psychological resources such as cultural worldviews, self-esteem, and close relationships function to help people manage creaturely and death concerns. Future research could examine the worldviews of people with particularly positive attitudes toward breast-feeding to determine whether such resources allow them to view breast-feeding with less negativity. Finally, as a way to overcome some of the prejudices associated with breast-feeding (in particular) and women (in general), it may be useful to develop positive cultural constructions of breast-feeding. Following Goldenberg and Roberts (2004), people could ameliorate the more threatening aspects of breast-feeding by imbuing the more creaturely aspects of breast-feeding (e.g., the expression of milk) with symbolic and cultural meaning and value (e.g., the affirmation of life, the human connection) so that breast-feeding can be embraced with minimal threat.

Overall, the current research contributes to a growing body of empirical evidence suggesting that people are threatened by that which blurs the human-animal boundary due to existential mortality concerns. The theoretical perspective offered here provides some insight into why people feel so ambivalent about breast milk and feeding behaviors. Being that breast-feeding is so fundamental an aspect of human behavior and so healthy for mother and baby, it is surprising that there is such scant empirical research directed toward understanding people’s ambivalence about it. Alongside the traditional, highly positive images associated with nursing mothers are the negative connotations of leaking breasts and bodily fluids. From an existential terror management perspective, the negative constructions of breast milk and breast-feeding may stem in part from the desire to deny our animal limitations and inevitability of death.

APPENDIX
PARTNER PERSONALITY PROFILE
USED IN STUDIES 2 AND 3

Initials: KMG

Personality Profile

Instructions: Thank you for participating. This questionnaire is a personal profile designed to give a brief impression of who you are as an individual. Please be honest and answer each question as accurately as possible. You will be exchanging this information with another person prior to doing the partner interaction task. Please place your initials at the top of the page to help the experimenter keep track of everyone’s forms.

Birth date: 3/12/83
Birth place: Chicago, IL
Major: Psychology
Clubs: Psi Chi
Other activities/interests: Reading, hiking, riding my bike
What did you do this past summer? I worked for most of the summer. I took a trip before the semester began.

What do you feel is society’s most pressing issue? The environment

NOTE: The partner’s responses are presented in bold.

NOTES

1. There was no significant effect of gender or an interaction with gender for any of the experiments, Fs = 1.65, ps = .20.
2. Data for 14 participants (6 women) were missing for the chair-distancing task due to participant (i.e., not following directions to set up the chairs or following the directions incorrectly) and experimenter errors (i.e., not recording the distance between chairs). The amount of missing data did not vary across conditions, χ²(df = 3) = 4.13, p = .25.

REFERENCES


