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Trio of Terror (Pregnancy, Menstruation, and Breastfeeding): An Existential Function of Literal Self-Objectification Among Women

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Research and theorizing suggest that objectification entails perceiving a person not as a human being but, quite literally, as an object. However, the motive to regard the self as an object is not well understood. The current research tested the hypothesis that literal self-objectification can serve a terror management function. From this perspective, the female body poses a unique existential threat on account of its role in reproduction, and regarding the self as an object is posited to shield women from this threat because objects, in contrast to humans, are not mortal. Across 5 studies, 3 operationalizations of literal self-objectification were employed (a denial of essentially human traits to the self, overlap in the explicit assignment of traits to the self and objects, and implicit associations between self and objects using an implicit association test) in response to 3 aspects of women's bodies involved in reproduction (pregnancy, menstruation, and breastfeeding). In each study, priming mortality led women (but not men, included in Studies 1, 3, 4, and 5) to literally self-objectify in conditions where women's reproductive features were salient. In addition, literal self-objectification was found to mediate subsequent responsiveness to death-related stimuli (Study 4). Together, these findings are the first to demonstrate a direct link between mortality salience, women's role in reproduction, and their self-objectification, supporting an existential function of self-objectification in women.

Keywords: terror management theory, literal self-objectification, menstruation, pregnancy, breastfeeding

Few would dispute the premise that women are objectified. Women, more often than men, are depicted in the media and interpersonal interactions as if their bodies are capable of representing them (Gill, 2003; Swim, Hyers, Cohen, & Ferguson, 2001), and women are also more likely to adopt this perspective of the self, focusing on how their body appears to others (e.g., McKinley & Hyde, 1996; Noll & Fredrickson, 1998). However, feminist and philosophical theorizing has long depicted objectification as more than just a focus on the body. Objectification, in its most basic sense, involves a denial of humanness. Martha Nussbaum (1995) suggested that objectification "leaves the human being . . . denuded of humanity" (p. 265); similarly, Andrea Dworkin (1997) argued that when a woman is sexually objectified, she forfeits her humanity and becomes regarded as "something, not someone" (p. 141). Furthermore, as we will review, recent research in social psychology has provided evidence for more direct forms of objectification consistent with such theorizing (e.g., Bernard, Gervais, Allen, Campomizzi, & Klein, 2012).

Although research has uncovered many underlying reasons for why people deny humanness to others (e.g., Castano & Giner-Sorolla, 2006; Haslam & Bain, 2007; Vaes, Heflick, & Goldenberg, 2010), terror management theory (Greenberg, Pyszczynski, & Solomon, 1986) offers a unique perspective on the motivation to perceive the self in a manner similar to an object (i.e., "literal self-objectification"). In short, humans are imbued with a threatening quality that objects are not: mortality. The body in particular has been shown to pose an existential threat associated with its sheer physicality and, thus, mortality (see Goldenberg, 2005; Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000), and this is especially true with respect to women's bodies on account of its prominence in reproduction (e.g., breastfeeding; Cox, Goldenberg, Arndt, & Pyszczynski, 2007). Objectifying women's bodies, as Goldenberg and Roberts (2004, 2010) theorized, may function as a defense against this threat. In the current research, we, for the first time, test this position directly, seeking to establish an empirical link between the awareness of mortality, women's role in reproduction, and their "literal self-objectification."

Objectification Theory: Objectification as Appearance Focus

Objectification theory (Fredrickson & Roberts, 1997) builds on the ideas of feminist scholars (e.g., Bartky, 1990; de Beauvoir, 1952/1989) to articulate the consequences of being female in a culture where women are evaluated, in large part, on the basis of their physical body. From this perspective, emphasis on women's appearance leads women to internalize an outside observer's perspective on the self, continuously monitoring how their body looks. Research derived from objectification theory typically tests the effects of self-objectification by using manipulations that heighten focus on one's body (e.g., trying on a swimsuit compared

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to a sweater; Fredrickson, Roberts, Noll, Quinn, & Twenge, 1998) or by assessing individual differences in trait self-objectification with a questionnaire that measures the importance of the body's appearance relative to its competence (Noll & Fredrickson, 1998; or alternatively with a measure of body surveillance, McKinley & Hyde, 1996).

A myriad of studies demonstrate that self-objectification leads to psychological consequences for women (for a review, see Moradi & Huang, 2008), such as reduced self-esteem and body satisfaction (Tiggemann, 2001), restrained eating, and cognitive performance deficits (Fredrickson et al., 1998; Gervais, Vescio, & Allen, 2011). Additionally, self-objectification has been linked to talking less in interpersonal interactions (Saguy, Quinn, Dovidio, & Pratto, 2010), decreased participation in social activism (Calogero, 2013), restrained movement (i.e., "throwing like a girl"; Harrison & Fredrickson, 2003), and a lack of intrinsic motivation (Gapinski, Brownell, & LaFrance, 2003). Thus, from the perspective of objectification theory, heightened focus on women's appearance leads to a number of consequences that detract from what theorists have referred to as "women's lived experiences" (Fredrickson et al., 1998). Relevant to the current hypothesis, it is notable that these outcomes reflect deficits in the qualities often associated with being human (e.g., competence, having a voice, an appetite, motivation, uninhibited movement).

Objectification as Dehumanization

Although objectification often entails a focus on women's appearance, classical theorizing about objectification (Kant, 1780–1781/1963; Nussbaum, 1995) suggests that it, quite literally, refers to viewing a person as more like an object and less like a human being. Contemporary research on dehumanization empirically demonstrates two distinct forms of dehumanization (Haslam, 2006; Haslam, Bain, Douge, Lee, & Bastian, 2005). People can be dehumanized by a denial of their human nature (mechanistic dehumanization) or their uniquely human status (animalistic dehumanization). When people are described in a more object-like, mechanistic manner, they are attributed less human nature (but not uniquely human attributes; Loughnan, Haslam, & Kashima, 2009). At an implicit level, groups that are viewed as lower in human nature traits are associated with objects (but not animals; Loughnan & Haslam, 2007). Further, traits indicative of these two types of humanness are correlated weakly, if at all (Haslam et al., 2005). In turn, although women, and sexualized women in particular, are clearly dehumanized at times by an association with animals (Vaes, Paladino, & Puvia, 2011), it is mechanistic dehumanization, or the denial of human nature, that aligns with classical and contemporary theorizing about objectification.

Several recent empirical studies using an array of manipulation to induce "objectification" of others provide converging evidence that objectification involves diminished perceptions of humanness, in favor of increased attributions of object-ness. Cikara, Eberhardt, and Fiske (2011) found that for men high in hostile sexism, sexualized women were implicitly associated with first-person action verbs (i.e., "have") compared to third-person action verb (i.e., "has"), indicating that they are perceived as objects, rather than agents. Converging with this, men's sexism was associated with decreased activation of neural responses associated with mental state attribution (a response consistent with when people view objects; Harris & Fiske, 2006) in response to viewing images of sexualized women. In addition, Bernard and colleagues (2012) examined person versus object recognition and found that sexualized women were recognized equally well inverted as right-side-up (as is characteristic of object perception) in contrast to sexualized men, and non-sexualized men and women, who were recognized as persons (i.e., better right-side-up). Loughnan et al. (2010) found that when people focused on a woman's body, and not her face, they attributed her less "mind" and moral status, and in a second study, sexualized targets (both male and female) were attributed less moral patiency (i.e., the ability to feel pain, hunger, or desire). Finally, focusing on a woman's appearance led others to view her as less competent and warm (traits considered primary dimensions of humanness; e.g., Fiske, Cuddy & Glick 2007; Heflick, Goldenberg, Cooper, & Puvia, 2011) and to embody less of the characteristics that they consider essential to human nature (Heflick & Goldenberg, 2009). Taken together, this recent research examining perceptions of others empirically demonstrates that objectification can be quite literal, involving diminished perceptions of humanness in favor of more object-like representations of others.

A Terror Management Perspective on Objectification

We have drawn on a wide range of philosophical, feminist, and social psychological evidence to conclude that objectification entails stripping persons of humanness, rendering them object-like. Here, we turn to terror management theory (Greenberg et al., 1986) to provide a theoretical lens through which to view the phenomenon of objectification and, specifically, to offer a functional account of why, and under what conditions, women are especially likely to be objectified.

Terror management theory starts with the assumption that the awareness of mortality threatens humans like nothing else, and a great deal of behavior functions to minimize this threat. Specifically, people cling to cultural constructions of meaning and strive to adhere to the standards of value espoused by their cultural worldview because, although death is inevitable, they can attain a sense of symbolic immortality through these means (see Solomon, Greenberg, & Pyszczynski, 2004, for a review). However, the physical body poses the potential to undermine these defenses by reinforcing the inescapable physicality, and therefore mortality, of humankind (Goldenberg, Pyszczynski, et al., 2000). In support of this, research has shown that people respond to reminders of mortality (mortality salience) by distancing from the physical body, reporting less interest in the physical aspects of sex (Goldenberg, McCoy, Pyszczynski, Greenberg, & Solomon, 2000), expressing more disgust toward bodily products (Goldenberg et al., 2001) and avoiding sensations and experiences grounded in the body (e.g., a foot massage; Goldenberg et al., 2006; also see Goldenberg, Heflick, & Cooper, 2008).

Although all bodies are potentially threatening on account of their corporeality, Goldenberg and Roberts (2004, 2010) argued that women's more prominent role in reproduction renders women's bodies especially problematic. Though men can also invest a great deal in the reproduction of the species, their obligatory, bodily investment is minimal compared to women's (Trivers, 1972), and not surprisingly, women are perceived to be more associated with biology and nature than are men (Ortner, 1974; Reynolds & Haslam, 2011). Moreover, taboos and regulations

surrounding women's reproductive features are long-standing and near universal (see Goldenberg, Roberts, Morris, & Cooper, 2013, for a review). Even in contemporary (liberated) Western culture, there are clear messages for women to keep their body's reproductive behaviors concealed (e.g., Kotex's new "crinkle-free" packaging: Kotex, n.d.; Facebook's removal of images of breastfeeding mothers: "Kristy Kemp, Breastfeeding Advocate," 2013).

Empirical research corroborates that when women fail to conceal the reproductive aspects of their bodies they are met with negative reactions. For example, Roberts, Goldenberg, Power, and Pyszczynski (2002) found that when a female confederate "accidently" dropped a tampon from her bag, participants viewed her as less competent and likeable and sat further away from her, compared to when she dropped a hair clip. Similarly, women portrayed as pregnant (wearing a pregnancy prosthesis) faced more hostile behavior by store employees when posing as customers, and they were especially likely to encounter hostility when applying for non-traditional gender role jobs (Hebl, King, Glick, Singletary, & Kazama, 2007). Women themselves often express negative attitudes toward their own reproductive functions, with many women reporting feeling stigmatized when menstruating (Kowalski & Chapple, 2000) and reporting a desire to eliminate their monthly menstrual cycle (Andrist, 2008).

Supporting an existential account of antipathy toward women's reproductive bodies, Goldenberg, Cox, Arndt, and Goplen (2007) found that highlighting the biological similarities between humans and animals (i.e., human *creatureliness*) increased negative reactions toward images depicting pregnant celebrities (compared to similar images of the celebrities not pregnant). Cox and colleagues (2007) demonstrated a direct link between negative reactions toward female reproduction and mortality concerns. Priming mortality led participants to view breastfeeding in public with more contempt and also to like less—and to position their chairs further away from—a purported partner they were led to believe was breastfeeding (compared to bottle-feeding) a baby in the next room. Further, when mortality was primed and participants were expected to interact with the breastfeeding partner, thoughts about human creatureliness (e.g., the words, "creature," "physical," and "saliva") were more cognitively accessible. Taken together, this research supports a framework in which women's unique reproductive features pose a threat associated with managing mortality concerns, and as a result, women, and women's reproductive behaviors specifically, may be subject to condemnation.

Reactions toward women's bodies, however, are not strictly marked by aversion and disapproval; rather, attitudes toward women are often seemingly quite positive (Glick & Fiske, 1996, 2011; also see Hebl et al., 2007), and their bodies are viewed as objects of beauty and desire (Fredrickson & Roberts, 1997). Goldenberg and Roberts (2010) suggested that the emphasis on appearance might be a means to strip women of their association with nature, and mortality. Indeed, in Roberts et al. (2002), when the confederate dropped a tampon from her bag, she was not only liked less, but participants high in gender schematicity (i.e., conforming to traditional gender roles) also responded by placing more emphasis on appearance for women in general. Furthermore, in other research, reminders of mortality have been found to lead women, but not men, to place more emphasis on their own appearance (Grabe, Routledge, Cook, Andersen, & Arndt, 2005) and to strive to attain appearance ideals (e.g., Cox et al., 2009).

However, as we have argued, objectification involves more than a focus on appearance. In its most basic sense, objectification involves regarding a person less like a human and more like an object. In this light, Goldenberg (2013) recently hypothesized that the literal objectification of women can serve a terror management function above and beyond a focus on outward appearance. In transforming women from human beings—plagued by mortality—to immortal objects, existential concerns may be managed. To date, however, no research has connected all of the dots between mortality concerns, women's role in reproduction, and their objectification. Mortality salience was not manipulated in Roberts et al. (2002). Moreover, Roberts et al. measured the focus on women's appearance, but they did not take the next step and examine whether women were actually perceived in a more object-like manner (i.e., less human). Further, no research has examined whether women will be motivated to regard the self as a literal object—that is, to deny their own humanness—in response to the existential concerns associated with mortality and their (reproducing) body.

Current Research

Drawing on terror management theory, and research on the literal objectification of women, it follows that reminders of women's role in reproduction, coupled with mortality salience, should motivate self-objectification as a response for women. This may entail a woman valuing her own appearance more (relative to competence), which is the traditional, though arguably indirect, manner of assessing self-objectification (we dub this measure of self-objectification "appearance emphasis" to avoid confusion with "literal objectification" in the remainder of the article). However, we have argued that self-objectification is not limited to such a response, and indeed, it is not clear that focusing on one's own appearance (in contrast to valuing women's appearance in general, as in Roberts et al., 2002) would ameliorate existential concerns. We posit that by transforming the self into an (immortal) object, the terror associated with mortality can best be managed. Thus, we hypothesize that highlighting the reproductive features of women's bodies—pregnancy (Studies 1, 3, and 5), menstruation (Study 2), and breastfeeding (Study 4)—in a context where mortality concerns are also salient should heighten literal self-objectification.

On the basis of theoretical and empirical research on objectification, we presume that people (and the self) can be perceived on a continuum ranging from human to object, with literal objectification representing a denial of humanness in favor of a more object-like representation. This approach has been best represented in Haslam's (2006) conceptualization of mechanistic dehumanization, or the denial of traits considered essential to human nature, and thus we rely primarily on this operationalization (Studies 1–3). This framework distinguishes the denial of human nature from a related type of dehumanization: animalistic dehumanization. Although highlighting women's role in reproduction may suggest an association with animals, this association should be threatening, especially when mortality is salient (Goldenberg et al., 2001), and thus, we do not offer any hypotheses with respect to animalization. Our hypotheses are exclusive to the specific type of dehumanization characterizing literal objectification.

Because the denial of human nature traits offers an arguably indirect measure of object-like perceptions, we follow up these

initial studies with more direct assessments of self/object associations. Employing a categorization task where people are asked to assign traits to both the self (or others) and objects (or humans), we sum the self and object trait overlap as an index of literal self-objectification (Study 4), and we also examine implicit associations between the self (relative to others) and objects (relative to humans) using an implicit association test (IAT; Study 5).

Finally, we explore whether this literal self-objectifying response functions to dampen concerns associated with mortality. To this end, we measure the accessibility of death-related cognition (Study 3) and how much time people spend writing about death (Study 4) as a means to assess the activation of death-related concerns subsequent to the assessment of literal objectification.

Preliminary Study: Human = Mortal, Objects = Immortal

An underlying premise of this research is that denying humanness to the self in favor of an object-like representation implies the antithesis to mortality because objects are immortal. Before embarking on our primary research, we conducted a preliminary study to test this assumption. To do this, we examined the correlation between the attributions of human nature to a series of traits and how much the same traits were perceived to be associated with mortality. Students in a large Introduction to Psychology class ($N = 136$) first rated the 15 traits used in Studies 1–3 (e.g., competent, trustworthy; from Haslam et al., 2005) on how essential they are to human nature and then the extent to which those traits are associated with being mortal (ranging from 1 = *not at all* to 5 = *entirely*). We conducted within-participant correlations on these two scales (in line with the methodology used in Studies 1–3), and then we analyzed the mean of the correlations using a single sample *t*-test against a test value of 0 (no correlation between the scales). Results revealed that the mean of the correlation was significantly different than zero, $t(29) = 4.04$, $p < .001$, $M = 0.279$. This indicates that the traits participants rated as high in human nature were also rated as highly associated with being mortal. Thus, by the same logic, as participants rate themselves lower on traits that are essential to human nature (i.e., literally self-objectify), they are distancing themselves from traits associated with mortality.

Study 1: Pregnancy and the Denial of Human Nature

Study 1 was designed to establish a link between mortality concerns, women's role in reproduction, and literal self-objectification as a response. To this end, we manipulated mortality salience and exposed participants to an image of a pregnant woman, or the same woman not pregnant. Subsequent to these manipulations, we assessed literal self-objectification, which we operationalized as a denial of humanness to the self (i.e., Haslam's, 2006, mechanistic dehumanization). We hypothesized that in the pregnancy condition, mortality salience would increase literal self-objectification among women. In contrast, we hypothesized that mortality salience would not have this effect among women in the non-pregnant image condition, and that there would be no effect of mortality salience on literal self-objectification among men in either the pregnant or non-pregnant image conditions. We also included a measure of animalistic dehumanization, on which we did not have any specific hypotheses. To examine specificity of our hypotheses to literal self-objectification, and not just a focus on appearance, we also included a traditional measure of self-objectification (the Self-Objectification Questionnaire [SOQ]; Noll & Fredrickson, 1998), which, as stated previously, we refer to as "appearance emphasis" to avoid confusion of terms.

Method

Participants and procedure. Ninety-three college students from the University of South Florida completed the study (M age = 20.66 years, $SD = 4.19$), including 52 female and 41 male participants.[1] The sample was 68% Caucasian, 9% Black, 12% Hispanic, 3% Asian/Pacific Islander, 1% Native American, and 7% other/more than one race. Participants were recruited from the Psychology Department's research pool and were awarded extra credit for participation. All materials were completed online, and participants were told the study was aimed at assessing how people form impressions.

Materials.

Mortality salience prime. The mortality salience manipulation (see, e.g., Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989) consisted of two open-ended essay questions regarding the feelings and emotions associated with one's own death, or experiencing intense pain in the control condition. The essay prompts stated, "Please describe the emotions that the thought of your own death (experiencing intense pain) arouses in you," and "Jot down, as specifically as you can, what you think will happen to you as you physically die (experience intense pain) and once you are physically dead (have experienced intense pain)." This was followed by a 60-item mood assessment (Positive and Negative Affect Schedule–Expanded Form [PANAS-X]; Watson & Clark, 1994) to measure affect and serve as a delay, since previous research has shown the effects of mortality salience are specific to when individuals are no longer consciously attending to such thoughts (e.g., Greenberg, Arndt, Simon, Pyszczynski, & Solomon, 2000).[2]

Pregnancy prime. To prime female reproduction, participants were shown an image of a woman, either pregnant or not pregnant, and were asked to examine it for a few moments. The control image utilized a woman, in her mid-20s, of average height and weight, and wearing a white skirt and black tank top, with a small portion of her stomach exposed. In the pregnant image, the same

[1] Given the vocabulary required for the dependent measures, we restricted participants in all studies to those indicating that English was their primary language. Inclusion of these participants did not affect the significant interactions or pairwise comparisons in any study, with the exception of Study 2. In this case, inclusion of non-primary English speakers resulted in a marginally significant Mortality Salience (MS) × Prime interaction on literal self-objectification scores ($p = .09$); however, the critical comparison of the effect of MS in the context of a menstruation prime remained significant ($p < .05$).

[2] We analyzed mood using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) and PANAS-X (Watson & Clark, 1994) scales in all studies following both the mortality manipulation and reproduction primes. Our manipulations did not influence positive or negative affect in Studies 1, 2, 4, and 5, and controlling for affect did not impact any of the critical significant interactions. There was a significant effect of mortality salience on negative affect in Study 3; this is reported in the results.

woman appears nearly identically but has an enlarged pregnant belly. Mood was then assessed again, this time with a 20-item measure (Positive and Negative Affect Schedule [PANAS]; Watson, Clark, & Tellegen, 1988) following the pregnancy prime (see Footnote 2).

Appearance emphasis. To examine the role of appearance emphasis as a function of our manipulations, we included the traditional measure of self-objectification (Self-Objectification Questionnaire [SOQ]; Noll & Fredrickson, 1998). Participants were asked to rank 10 items—five appearance-related (e.g., physical attractiveness) and five competence-related (e.g., energy level)—on a scale ranging from 0 (*having the least impact*) to 9 (*having the greatest impact*) on their physical self-concept. As in previous research, self-objectification scores, ranging from −25 to 25, are calculated by subtracting the sum of the competence items from the sum of the appearance items, with higher scores indicating a greater emphasis on appearance.

Denial of human nature. Literal self-objectification was operationalized as a denial of human nature to the self, according to Haslam's (2006) conceptualization of mechanistic dehumanization. Participants first rated the extent to which 15 traits (e.g., competent, trustworthy; from Haslam et al., 2005) describe themselves, and subsequently how much "each of the following traits are essential to human nature (what most characterizes being human)" (ranging from 1 = *not at all* to 5 = *entirely*). We then conducted within-participant correlations between how descriptive each trait was of the self and participants' human nature ratings for each trait (e.g., Heflick & Goldenberg, 2009; Paladino & Vaes 2009). This results in a score in which lower values indicate more denial of human nature to the self (or greater literal self-objectification). To allow for a more intuitive interpretation (where higher scores indicate a greater degree of literal self-objectification), these values were subtracted from 1, yielding a score ranging from 0 to 2.

Animalistic dehumanization. To determine whether our effects were specific to objectification, and not animalization, we included a measure of animalistic dehumanization in which participants rated how much each of the traits is unique to humans (ranging from 1 = *entirely shared with animals* to 5 = *entirely unique to humans*). We again conducted within-participant correlations between how descriptive each trait was of the self and participants' human uniqueness rating for each trait and subtracted this value from 1 to generate an animalistic dehumanization score. All participants first completed the trait typicality measure; the subsequent human nature and animalization scales were counterbalanced.

Demographics. Participants completed several demographic questions assessing age, gender, and probing reactions to the study.

Results

To examine our hypothesized effects on literal self-objectification, we conducted a 2 (Salience: mortality vs. pain) × 2 (Image: pregnant vs. non-pregnant) × 2 (Gender: male vs. female) analysis of variance (ANOVA) on participants' denial of human nature. All main effects and two-way interactions were non-significant (*p*s > .22).[3] As predicted, the analysis revealed a three-way interaction between mortality salience, image, and gender, $F(1, 85) = 8.97$, $p < .01$, $\eta_p^2 = .095$. To deconstruct this interaction, simple effects analyses were performed. Results indicated that for women in the pregnant image condition, mortality salience increased the denial of human nature to the self (i.e., increased literal self-objectification), $F(1, 85) = 4.69$, $p < .05$, $\eta_p^2 = .052$. Among women in the non-pregnant image condition, the effect of mortality salience was not significant and was in the opposite direction ($p = .11$). Men in the pregnant image condition responded in the opposite manner as women, denying their human nature less when mortality was salient, $F(1, 85) = 4.43$, $p < .05$, $\eta_p^2 = .049$. Mortality salience had no effect on denial of human nature for men in the non-pregnant image condition ($p = .79$). These means are presented in Figure 1.

To determine whether our results were specific to objectification, and not animalization, we conducted the same 2 (Salience: mortality vs. pain) × 2 (Image: pregnant vs. non-pregnant) × 2 (Gender: male vs. female) ANOVA on participants' animalistic dehumanization scores. No significant main effects or interactions emerged (*p*s > .12), and the critical Salience × Image × Gender interaction was non-significant ($p = .17$). Further, the denial of human nature and animalistic dehumanization subscales was uncorrelated, $r(89) = .08$, $p = .46$ (consistent with the findings of Haslam et al., 2005; Rudman & Mescher, 2012), and controlling for animalistic dehumanization did not affect the significant results with respect to the denial of human nature.

To test the role of our manipulations on appearance emphasis, we conducted a 2 (Salience: mortality vs. pain) × 2 (Image: pregnant vs. non-pregnant) × 2 (Gender: male vs. female) ANOVA on scores on the SOQ. Consistent with prior research (e.g., Fredrickson et al., 1998), there was a main effect of gender, $F(1, 85) = 6.21$, $p < .05$, $\eta_p^2 = .068$, with women ($M = 3.85$, $SD = 12.12$) showing significantly higher scores than men ($M = -2.12$, $SD = 9.76$). This was qualified by a three-way interaction between mortality, image, and gender, $F(1, 85) = 4.80$, $p < .05$, $\eta_p^2 = .053$. We again conducted simple effects analyses to deconstruct the interaction. Results indicated that women shown the pregnant image responded with an increased emphasis on their appearance when primed with mortality compared to pain, $F(1, 85) = 8.73$, $p < .01$, $\eta_p^2 = .093$ (see Figure 2). There was no effect of mortality salience within the non-pregnant image condition ($p = .57$). Mortality salience had no effect on appearance emphasis for men in the pregnant image condition ($p = .56$) or men in the non-pregnant image condition ($p = .71$). Appearance emphasis was also not correlated with literal self-objectification, $r(93) = -.08$, $p = .46$, and controlling for appearance emphasis did not influence the significant Salience × Image × Gender interaction on the denial of human nature.

Discussion

These results support our primary hypothesis: Women primed with pregnancy showed an increased tendency to deny themselves humanness in response to mortality salience. Men, in contrast, responded with the opposite tendency when primed with preg-

[3] We also examined presentation order of the denial of human nature and animalistic dehumanization subscales in this study and in Study 2: There was no main effect of order, and order did not interact with any other variables in the analysis. In addition, including order as a factor in the analyses does not change any results.

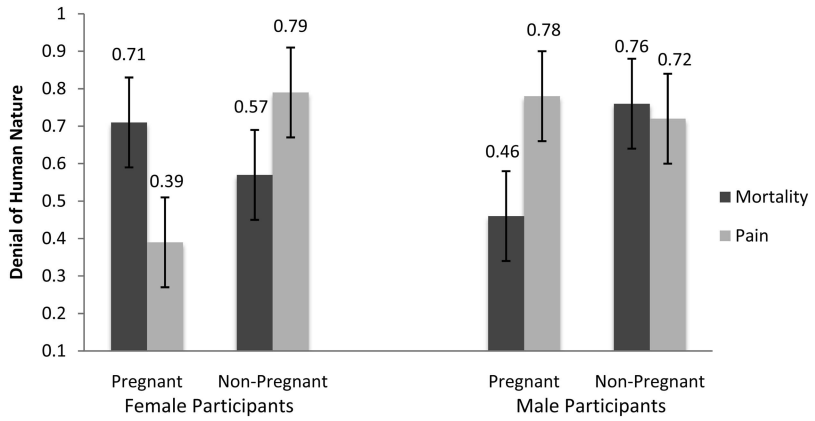


Figure 1. Denial of human nature as a function of mortality salience and pregnancy prime. Error bars represent the standard error of the mean.

nancy; they denied their own human nature less in response to mortality salience. Mortality salience in the absence of female reproduction had no effects (for men or women). This establishes an important link between mortality concerns, reminders of female reproduction, and literal self-objectification, and provides initial validation for the theoretical proposition that women are objectified (or at least, objectify themselves) because of an inherent existential threat associated with their body (Goldenberg & Roberts, 2004). Additionally, by assessing the humanness attributed to the self, this study utilized a measure of literal objectification, in contrast to the focus on appearance traditionally measured in the self-objectification literature.

We also found that women, but not men, displayed an increased emphasis on their appearance relative to their body's competence as a function of mortality salience when pregnancy was primed. Interestingly, our measures of literal self-objectification and appearance emphasis (the traditional self-objectification questionnaire) were not correlated, suggesting that although appearance focus may be one way that women self-objectify, it is not the same as viewing the self as a literal object. The results of this study, along with previous research using this and other measures tapping into literal objectification (e.g., Bernard et al., 2012; Heflick & Goldenberg, 2009), demonstrate that objectification, beyond a focus on outward appearance, may involve the denial of qualities essential to being human.

Further, these results help to provide an important distinction between associations of the self (or others) with objects compared to animals. Animalistic dehumanization was not affected by our manipulations and was not related to literal self-objectification. Although mortality salience has been shown to motivate a desire to distance the self from animals (Goldenberg et al., 2001), this may prove especially difficult to do when women have just been reminded of their bodily role in reproduction. In short, it is likely that there were competing forces impacting animalization (a desire to see one's self as distinct from an animal; an inability to see one's self as distinct from an animal). Critically though, the specificity of effects to literal self-objectification, and not animal-

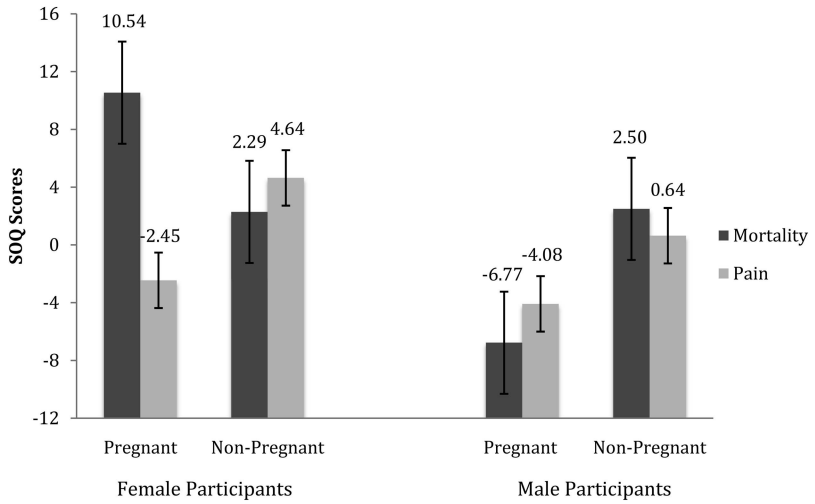


Figure 2. Appearance emphasis as a function of mortality salience and pregnancy prime. Error bars represent the standard error of the mean. SOQ = Self-Objectification Questionnaire.

istic dehumanization, supports our hypothesis for a terror management perspective on literal self-objectification.

Study 2: Menstruation and the Denial of Human Nature

The aim of Study 2 was twofold: First, we sought to extend the findings of Study 1 to another domain associated with female reproduction. Second, we wanted to further disentangle our operationalization of literal self-objectification from a focus on appearance. Our position is that although objectification may involve, and be caused by, an emphasis on physical appearance (Fredrickson & Roberts, 1997; Heflick & Goldenberg, 2009), this is not the same as literal objectification. Objectification, in a more literal sense, entails viewing a person, or the self, as an object, and it is in this way that objectification can function as a rather direct solution to the threat associated with mortality.

Our first study demonstrated that women showed a tendency to literally self-objectify as a function of a mortality and reproduction prime, and that these same women also placed a greater emphasis on their appearance (but appearance emphasis and literal self-objectification were unrelated to each other). However, it is possible that the image of the pregnant woman activated concerns about appearance, driving the effect on our measure of appearance emphasis. Unlike pregnancy, however, menstruation has relatively little, if any, implications for a woman's outward appearance. Therefore, we selected menstruation as our second domain of female reproduction to help tease apart literal self-objectification from appearance emphasis. We hypothesized that reminders of menstruation, coupled with mortality salience, should again motivate women to literally objectify (deny human nature to) themselves, but not necessarily to prompt an emphasis on appearance. Again, we did not expect effects for animalistic dehumanization.

Method

Participants and procedure. Sixty-three female University of South Florida students, ranging in age from 18 to 24 years (M age = 19.46 years, SD = 1.49), participated in the study.[4] The sample was 70% Caucasian, 16% Black, 3% Asian, and 11% other/more than one race. Participants were recruited from the Psychology Department's research pool and were awarded extra credit for participation. All materials were completed individually in the lab. Participants were told the study was aimed at assessing personality and attitudes.

Materials.

Mortality salience prime. The mortality salience manipulation consisted of the same open-ended essay questions used in Study 1, either priming death or intense pain. Again, we included the same mood assessment as Study 1 (PANAS-X; Watson & Clark, 1994), designed to serve as a delay and assess affect.

Menstruation prime. Participants were given one packet of questionnaires and were asked to complete them alone in a room. Upon competition, they were instructed to knock on the door to signal to the female experimenter that they were ready for the rest of the materials. After handing the participants the second packet of questionnaires, the experimenter asked a question designed to manipulate the salience of menstruation. In the experimental condition, the experimenter asked, "Do you happen to have an extra tampon I can have?" In the control condition, the experimenter requested a pencil.[5] Subsequent to the menstruation prime, participants completed the same 20-item mood assessment (PANAS; Watson et al., 1988) used in Study 1.

Appearance emphasis. Again, we used the SOQ (Noll & Fredrickson, 1998) to assess an emphasis on appearance.

Denial of human nature. We again operationalized literal objectification as the denial of human nature and used the same methodology employed in Study 1, computing the within-participant correlation between trait typicality ratings and human nature ratings. As in Study 1, we subtracted these values from 1, so that higher scores denote more literal objectification.

Animalization dehumanization. We computed the same within-participant correlations on trait typicality and human uniqueness ratings used in Study 1 to measure animalistic dehumanization.

Demographics. Participants completed the same demographic questionnaire as in Study 1.

Results

We examined the effects of the manipulations on literal objectification with a 2 (Salience: mortality vs. pain) × 2 (Prime: menstruation vs. pencil) ANOVA on participants' denial of human nature. Only the predicted Salience × Prime interaction emerged, $F(1, 59) = 4.86$, $p < .05$, $\eta_p^2 = .076$. As can be seen in Figure 3, women provided with reminders of menstruation responded with more denial of human nature when primed with mortality compared to pain, $F(1, 59) = 3.99$, $p < .05$, $\eta_p^2 = .063$. In contrast, there was not a significant effect of mortality salience in the pencil control condition ($p = .26$).

We then conducted the same 2 (Salience: mortality vs. pain) × 2 (Prime: menstruation vs. pencil) ANOVA on participants' animalistic dehumanization scores. Results revealed no significant main effects or interactions ($ps > .13$). Again, the denial of human nature was uncorrelated with animalistic dehumanization, $r(64) = -.09$, $p = .44$. Further, controlling for animalistic dehumanization did not influence the significant Salience × Prime interaction on the denial of human nature.

We conducted the same 2 × 2 ANOVA on participants' scores on the SOQ. There were no significant effects ($ps > .21$); the critical Salience × Prime interaction was not significant ($p = .61$).

Discussion

These results again provide support for our hypothesis that priming mortality, when coupled with a manipulation highlighting female reproduction, motivates women to literally self-objectify. As in Study 1, the findings were specific to literal objectification and not to animalistic dehumanization.

[4] We excluded two participants who were outliers on age (more than three standard deviations above the mean and over age 50 years) and likely no longer having regular menstrual periods.

[5] Fifteen participants gave the experimenter a pencil, whereas only eight gave the experimenter a tampon ($p < .05$). Critically, this did not differ as a function of mortality salience ($ps > .67$), and controlling for whether or not participants gave the item asked for did not influence the significant Salience × Prime interaction ($p < .05$).

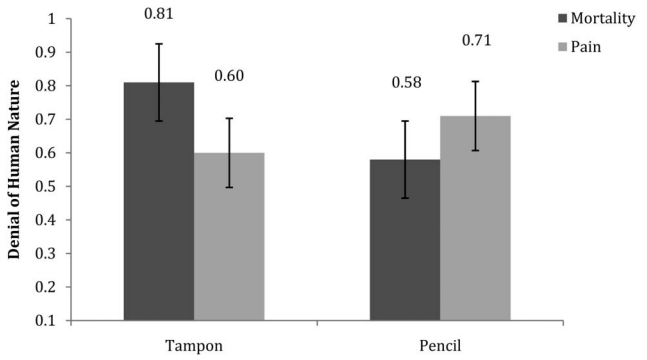


Figure 3. Denial of human nature as a function of mortality salience and menstruation prime. Error bars represent the standard error of the mean.

In contrast to our first study, we did not find any significant effects on the measure of appearance emphasis. Although this inconsistency should be interpreted with caution, we believe that it is likely to have resulted from the greater relevance of pregnancy for women's appearance than menstruation. Pregnancy may not only be viewed as unattractive, but it can have lasting consequences for women's appearance; in contrast, menstruation does not, and it is easily and perpetually concealed from others. Additionally, viewing an image of a visibly pregnant woman may promote favorable comparisons between one's own appearance and the appearance of the pregnant woman. In this sense, appearance may become a source of self-esteem and, as such, a domain that individuals cling to in response to mortality salience (Goldenberg, Cooper, Heflick, Routledge, & Arndt, 2011; Goldenberg, McCoy, et al., 2000). Clearly, further research is necessary to test these hypotheses, but critically, the reliability of the findings for literal objectification, and not for an emphasis on appearance, is consistent with our position that objectification is something different from a focus on appearance, that objectification, in its more literal sense, can function as terror management.

Priming menstruation in this study demonstrates generalizability of the pregnancy findings to another domain of female reproduction, and it also demonstrates effects in the context of a more naturalistic manipulation than viewing a stranger's pregnancy in a photograph. Asking to borrow a pencil in the control condition offered a reasonable comparison because a pencil is also an object that any woman might have concealed in their bag (unlike a hair clip, as in Roberts et al., 2002, that would be unreasonable to request from women with short hair). However, the pencil control condition differed from the experimental condition in ways other than being unrelated to female reproduction. Notably, it was unrelated to anything associated with being female. Though this is a limitation, it is not clear how this difference could account for the effects. Further, it is a difference limited to this study (the pregnancy control image depicts a woman), and one that Study 4 is designed specifically to address.

Study 3: Pregnancy, Denial of Human Nature, and Accessibility of Death Thought

Across two studies, a consistent picture emerged: Women primed with mortality and reminders of female reproduction responded by denying their own human nature, and we have suggested that this denial of humanness reflects the literal objectification of the self. An alternative explanation, however, is that women were simply derogating themselves (and men lauding themselves in Study 1). Study 3 was designed to test this alterative. To that end, we replicated Study 1 in a non-college student sample, and we asked participants to judge the valence of the traits in addition to the humanness. We did not expect effects on valence of the traits, and critically, we hypothesized that women's denial of humanness would hold when controlling for valence ratings.

In addition, in Study 3 we included a measure of the accessibility of death-related thoughts subsequent to measuring literal objectification. To the extent that literal objectification serves an existential function, we posited that denying one's humanness in response to reminders of mortality and reproduction should be associated with decreased accessibility of death-related thoughts. This is consistent with terror management theory's premise that effective defensive responses to mortality salience reduce the accessibility of death-related thought (see J. Hayes, Schimel, Arndt, & Faucher, 2010).

Method

Participants and procedure. One hundred thirty-nine participants (M age = 37.24 years, SD = 21.54) took part in the study. The sample consisted of 79 female and 60 male participants, who were recruited online through Amazon mTurk and who were compensated $0.35 for their participation. The sample was 82% Caucasian, 5% Black, 5% Asian/Pacific Islander, 2% Hispanic, 1% Native American, and 5% other/more than one race. Participants completed all materials online and were told the study was aimed at assessing how people form impressions.

Materials.

Mortality salience prime. The mortality salience manipulation consisted of the same open-ended essay questions regarding the feelings and emotions associated with one's own death, or experiencing intense pain, as in Studies 1 and 2. This was again followed by the 60-item mood assessment (PANAS-X; Watson & Clark, 1994) to serve as a delay and assess affect.

Pregnancy prime. To prime female reproduction, participants were shown the images used in Study 1. They featured the same woman, either pregnant or prior to pregnancy. Mood was assessed again with the same 20-item measure (PANAS; Watson et al., 1988) following the pregnancy prime.

Denial of human nature. We used the same measure of literal objectification employed in Studies 1 and 2 (and did not include the SOQ so as to ensure that responding to that measure played no role in the effects on this one). We again conducted within-participant correlations between how descriptive each trait was of the self and participants' human nature ratings for each trait (e.g., Heflick & Goldenberg, 2009; Paladino, & Vaes, 2009), and we subtracted this value from 1 so that higher scores indicate increased literal objectification.

Valence. In addition to assessing self-trait attributions and human-nature attributions, we also measured the valence of each trait. In this scale, participants were given the same 15 traits and were asked to rate how desirable each trait is to possess (ranging from 1 = *very undesirable* to 5 = *very desirable*). We then conducted within-participant correlations between the desirability

of the traits and the attributions of the traits to the self (e.g., Paladino & Vaes, 2009). Higher scores indicate the attribution of more desirable traits to the self.

Death thought accessibility. To assess the accessibility of death-related cognitions, we used a word fragment task employed in previous research (e.g., Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997). The task consists of a set of 25 word fragments (e.g., COFF__ __), five of which can be completed with either neutral (e.g., coffee) or death-related (coffin, grave, dead, kill, and buried) words. The number of word fragments completed with death-related words was summed to compute an index of death thought accessibility for each participant.

Demographics. Participants completed several demographic questions assessing age, gender, and probing reactions to the study.

Results

To examine literal objectification, we first conducted a 2 (Salience: mortality vs. pain) × 2 (Image: pregnant vs. non-pregnant) × 2 (Gender: male vs. female) ANOVA on participants' denial of human nature. Results revealed only the predicted significant three-way interaction between mortality salience, image, and gender, $F(1, 131) = 6.84$, $p < .01$, $\eta_p^2 = .050$. Replicating Study 1, women who were in the pregnant image condition showed an increase in denial of human nature after being primed with mortality, compared to those primed with pain, $F(1, 131) = 3.71$, $p < .05$, $\eta_p^2 = .027$. The effect of mortality salience was not significant for women who saw the non-pregnant image ($p = .07$), and the pattern was reversed. There was also no effect of mortality salience for men who saw either the pregnant ($p = .34$) or the non-pregnant ($p = .50$) image. These means are presented in Figure 4.

Next, we conducted the same 2 (Salience: mortality vs. pain) × 2 (Image: pregnant vs. non-pregnant) × 2 (Gender: male vs. female) ANOVA on the correlation between the valence (desirability) of the traits and attributions of the traits to the self (Vaes et al., 2010). Results revealed no significant main effects or interactions (ps $> .25$), demonstrating that participants were not responding to the manipulations by attributing traits to the self as a function of their valence. Further, controlling for the correlation between trait ratings and desirability ratings did not influence the significant Salience × Image × Gender interaction on denial of human nature scores.

As in the other studies, we examined the positive and negative affect scales after the mortality salience and pregnancy prime, and we found no effects after the pregnancy prime. However, we did find that after participants were primed with mortality they reported greater negative affect than when primed with pain ($p < .05$). Critically, as in the other studies, controlling for affect did not influence the critical interaction on our measure of literal objectification and did not alter any other effects.

To assess the impact of literal objectification on death thought accessibility, we conducted a moderated mediation analysis, using a bootstrapping approach (Model 7; A. F. Hayes, 2012) with mortality salience as the predictor variable, literal objectification (denial of human nature) as the mediator, death-thought accessibility as the outcome variable, and the reproduction prime moderating the path from mortality salience to literal objectification. However, we did not find evidence to support this model. To inform our understanding of the relationship between literal objectification and the management of mortality concerns, we used an exploratory analysis to examine the correlation between denial of human nature and death thought accessibility on the word fragment task within each condition. The analyses revealed a significant negative correlation for women primed with mortality and the pregnant image, $r(19) = –.615$, $p < .01$, such that as women denied themselves human nature, death thought accessibility was reduced. Only one other significant correlation emerged, for women not primed with mortality and shown the pregnant image. In this case, there was a significant positive correlation, $r(21) = .551$, $p < .01$, suggesting that for women primed only with

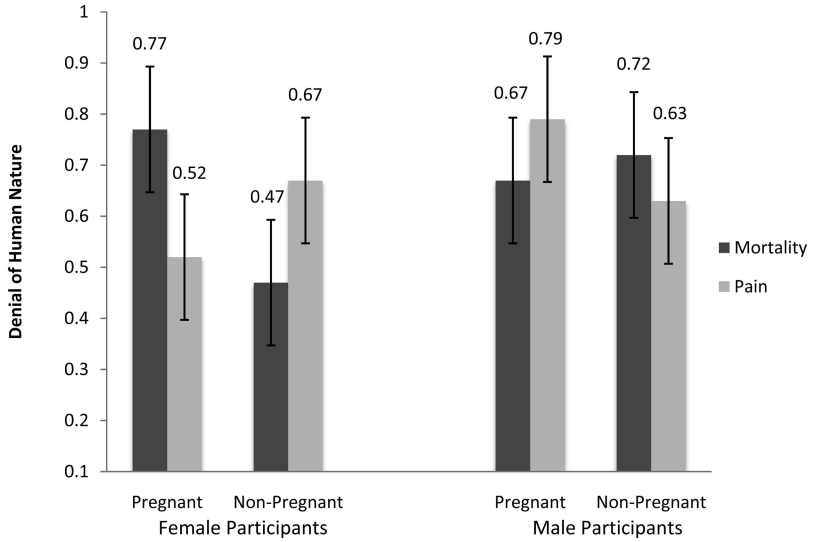


Figure 4. Denial of human nature as a function of mortality salience and pregnancy prime. Error bars represent the standard error of the mean.

pregnancy, denying oneself humanness is associated with increases in death-related cognitions. The correlation between literal objectification and death thought accessibility was non-significant in all other conditions ($ps > .21$).

Discussion

The results of this study provide additional evidence for the hypothesis that self-objectification can serve a terror management function. Replicating the results of Study 1 in a more representative sample, we found that women primed with mortality and given reminders of pregnancy responded with increased literal objectification. Additionally, the results of this study confirmed that women's literal objectification response to the manipulations is independent of positive or negative endorsements of the traits. We found no effect on the correlation between participants' self-ratings and the desirability ratings of the traits.

Despite our failure to find the hypothesized moderated mediation effect, the correlational evidence suggests that increased literal objectification may be associated with reduced death thought accessibility for women primed with both pregnancy and mortality. It is important to note, however, that this correlational analysis (unlike moderated mediation) only examines patterns of relationships between literal objectification and death thought accessibility within each combination of manipulations, ignoring the influence of the manipulations at the first stage. For this reason, the correlations were examined only to inform our understanding of these relationships, and not to draw any causal conclusions between variables. We also are not sure why the opposite pattern emerged (death thought accessibility increased in conjunction with the denial of humanness) for women shown the pregnant image and not primed with mortality, but it is consistent with the idea that there may be some utility associated with denial of humanness specifically when women are using it as a defense. In light of these ambiguities, Study 3 is inconclusive regarding the potential for literal objectification to help manage death concerns.

Study 4: Breastfeeding, Explicit Self/Object Overlap, and Time Spent Writing About Death

There were several aims of Study 4. First, we wanted to extend the findings of our first three studies into the final domain of reproduction by using an image of a breastfeeding woman as the reproduction prime. This also afforded us the opportunity to use an equally feminine control prime (a limitation of the pencil control prime in Study 2) by showing an image of a woman bottle-feeding her baby.

Additionally, in the previous studies, literal objectification was operationalized as a denial of human nature. Though the denial of human nature attributes is causally related to viewing people as object-like (Loughnan et al., 2009), more confidence in the literal objectification interpretation would be garnered from a direct assessment of associating the self with objects. To test this more directly, we employed a scale in which participants assigned traits to the self (or others) and also assigned the same traits to objects (or humans). The amount of self/object overlap was used as an index of literal objectification. We hypothesized that in the breastfeeding image condition, mortality salience would increase the self/object overlap among women. In contrast, we hypothesized that women in the bottle-feeding image condition would not show the same increased self/object overlap in response to mortality salience and that mortality salience would have no effect on men's self/object overlap scores in either condition.

Finally, we again sought to test the hypothesis that literal self-objectification serves a palliative function. Here, instead of measuring the cognitive accessibility of death thoughts, we asked participants to write about the thoughts and feelings related to their death and timed how long they wrote. A wide range of research shows that when people view stimuli as threatening, more time is spent cognitively processing the information (e.g., Gotlib & McCann, 1984; Simpson et al., 2000; Williams, Mathews, & MacLeod, 1996). Thus, we reasoned that to the extent that people have already defended against the threat associated with mortality, they should spend less time writing about it when they are prompted again subsequently. Specifically, we hypothesized that for women, increased literal objectification (as a function of the manipulations) would reduce the amount of time spent responding to a subsequent death prompt.

Method

Participants and procedure. One hundred forty-six participants took part in the study. The sample consisted of 69 females and 77 males, and it ranged in age from 18 to 74 years (M age = 34.80 years, SD = 12.05).[6] The sample was 83% Caucasian, 5% Black, 5% Asian/Pacific Islander, 4% Hispanic, 1% Native American, and 2% other/more than one race. Participants were recruited online through Amazon mTurk and were compensated $0.40 for their participation. Participants completed all materials online and were told the study was aimed at assessing personality and attitudes as well as how people make quick assessments of others.

Materials.

Mortality salience prime. Mortality salience was manipulated using a 15-item true/false measure (Rosenblatt et al., 1989) with statements aimed at activating thoughts of death (e.g., "I am very much afraid to die") or pain (e.g., "I am very much afraid of pain") in a control condition. Again, this was followed by the 60-item PANAS-X scale (Watson & Clark, 1994) to serve as a delay and assess affect.

Breastfeeding prime. Following the mortality manipulation, participants were given instructions indicating that they were going to view a randomly assigned photo of a person taken throughout the course of their daily life, and they would be asked to evaluate the person later in the study. The breastfeeding prime was a photo of a young woman, sitting outside and breastfeeding her baby. The control image depicted a similar looking woman, also sitting outside, but bottle-feeding her baby. After the image prime, we measured affect using the 20-item PANAS (Watson et al., 1988).

Self/object overlap. To assess literal objectification, we designed a measure modeled after Martínez and Rodríguez-Bailón

[6] In Studies 4 and 5, participants who completed the study more than once (i.e., had duplicate entries) were removed from the final sample. Additionally, our manipulations depend on participants completing the study at one time; therefore, participants who completed the study over different time points (either hours or days apart) were also not included in the final sample (N = 9, Study 4; N = 13, Study 5).

(2012). Participants were presented with 20 traits listed on the left side of their screen (e.g., competent, trustworthy; used in Studies 1–3; from Haslam et al., 2005) and two boxes on the right side of their screen labeled "Object" and "Human." They were instructed to "decide the category in which each word best fits" by dragging and dropping the word into the appropriate box. They were told to categorize all 20 words, with 10 words in each category. On the next screen, participants were given the same task and instructions, but the categories were "Self" and "Others." To compute an index of literal objectification, we summed the number of words that participants assigned to the object category and also to the self category. This generated a score ranging from 0 to 10, with higher scores indicating more self/object overlap.

Time spent writing about death. We then assessed participants' salient mortality concerns. Specifically, following the assessment of literal objectification, participants were instructed to write about the thoughts and feelings associated with their own death (the mortality salience prime from Studies 1–3). During this task, we timed how long each participant wrote, with less time spent writing about death indicating less activation of death-related concerns.

Demographics. Finally, participants completed several demographic items at the end of the study.

Results

We first conducted a 2 (Salience: mortality vs. pain) × 2 (Image: breastfeeding vs. bottle feeding) × 2 (Gender: male vs. female) ANOVA on participants' self/object overlap scores. Only the predicted Salience × Image × Gender interaction emerged, $F(1, 138) = 3.94$, $p < .05$, $\eta_p^2 = .028$. To deconstruct this interaction, simple effects analyses were conducted. As hypothesized, among women in the breastfeeding image condition, mortality salience significantly increased the amount of self/object overlap relative to the pain condition, $F(1, 138) = 3.93$, $p < .05$, $\eta_p^2 = .028$. The effect of mortality salience on self/object overlap was non-significant for women in the bottle-feeding image condition ($p = .97$). Further, mortality salience had no effect on men in the breastfeeding image condition (and they responded in the opposite manner; $p = .11$) or the bottle-feeding image condition ($p = .75$). These means are presented in Figure 5.

To examine the effect of our manipulations on subsequent mortality concerns, we conducted moderated mediation analysis using a bootstrapping approach (Model 7; A. F. Hayes, 2012). Bootstrapping is a regression-based analysis used to generate a 95% confidence interval (CI) of the estimates for both direct and indirect paths in the model (a 95% CI that does not include zero is considered statistically significant; Preacher & Hayes, 2008). We estimated the effects derived from 10,000 bias corrected bootstrap samples, with mortality salience (coded as 0 = pain, 1 = mortality) as the focal predictor variable, literal objectification (self/object overlap) as the mediator, and death essay writing time (in seconds) as the outcome variable. In this model, the breastfeeding prime (coded as 0 = bottle-feeding image, 1 = breastfeeding image) was tested as moderating the path from mortality salience to literal objectification scores (see Figure 6 for the conceptual model). We conducted separate analyses for male and female participants.

In our analysis of female participants, the test of the conditional indirect effect was significant. Literal objectification in response to mortality salience and the breastfeeding image mediated the total amount of time spent writing on the death essay (mean estimate = −23.04, Boot *SE* = 16.93, CI [−70.966, −0.539]). Women in the breastfeeding condition scored higher on the measure of literal objectification when mortality was salient, and this in turn reduced the amount of time spent they spent writing about death. This was not the case in the bottle-feeding image condition (mean estimate = 0.39, Boot *SE* = 12.21, CI [−25.176, 25.999]). In addition, the analysis of male participants revealed no evidence of moderated mediation for male participants shown either image (breastfeeding image: mean estimate = 0.737, Boot *SE* = 8.63, CI

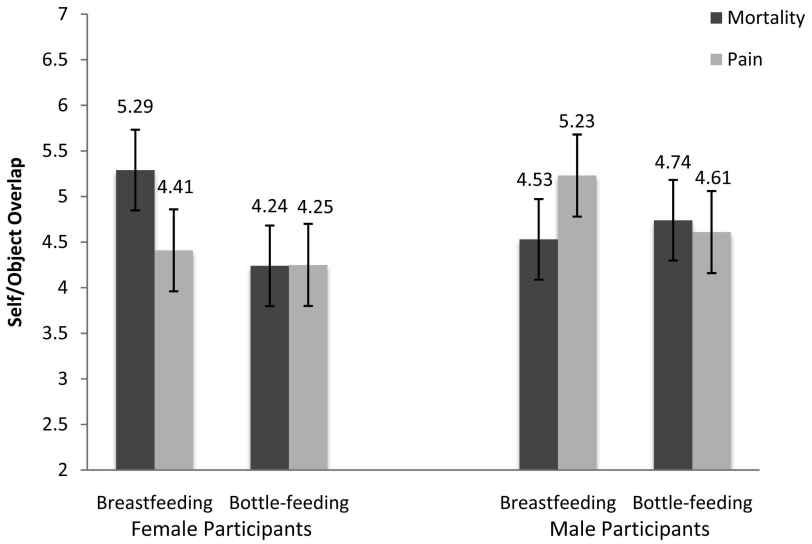
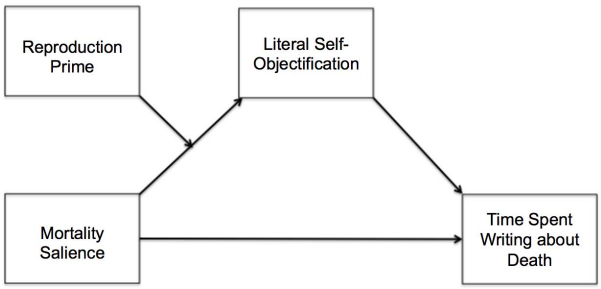


Figure 5. Self/object overlap scores as function of mortality salience and breastfeeding prime. Error bars represent the standard error of the mean.



Conditional indirect effect(s) of *X* on *Y* on values of the moderator:

Mediator	Image	Effect	Boot SE	Lower CI	Upper CI
Literal Self-Objectification	0	.39	12.212	-25.176	25.999
Literal Self-Objectification	1	-23.04	16.925	-70.995	-.539

Figure 6. Moderated mediation analysis on female participants' time spent writing about death. CI = confidence interval.

[−9.291, 26.977]; bottle-feeding image: mean estimate = −4.06, Boot *SE* = 16.21, CI [−61.327, 15.361]).

Discussion

The results of Study 4 converge with evidence from our previous studies and demonstrate support for our primary hypothesis: Women shown the breastfeeding image and primed with mortality responded with greater literal objectification, compared to those primed with pain. Mortality salience had no effect on women shown the bottle-feeding image, or male participants. In addition, literal objectification in response to mortality salience and a reproduction prime subsequently reduced the amount of time spent writing an essay about death.

Using a breastfeeding prime in this study not only extends our analysis to a third (and final) domain of female reproduction, but also enabled us to rule out the possibility that the female reproduction manipulations had effects, not on account of their association with reproduction, but on account of their association with femininity, or maternity. Here, the breastfeeding and bottle-feeding primes are comparable in that both are associated with being a woman, and a mother, but critically differ only on the dimension of highlighting women's reproductive features or not. The finding that mortality salience only increased literal objectification among women shown the breastfeeding image suggests that this response is not about femininity or maternity, but specifically about being a reproducing, lactating (mortal) woman.

The measure of literal objectification employed in this study deviated from the denial of humanness measured in Studies 1–3. Here, we tested our literal objectification position by pitting human and objects against each other and measuring the overlap in attributions of various traits to the self (or others) and objects (or humans). This provides a more direct test of, and support for, our theoretical position, demonstrating that women are not only viewing themselves as less human in response to the manipulations, but that they are doing so in favor of being more like an object.

Finally, we found support for our hypothesis that literal objectification provides protection from mortality concerns with a novel paradigm, measuring the amount of time spent writing an essay about death. As hypothesized, the more participants literally self-objectified in response to thinking about mortality and breastfeeding, the less time they took to complete their response to the death prompt. In conjunction with the correlational findings in Study 3, and the preliminary research associating humanness with mortality, this finding suggests that literal objectification is tied to the management of existential concerns: Not only is it instigated as a result of a death (and reproduction) prime but the manifestation of literal objectification in response affects subsequent reaction to death-related stimuli in a way suggestive of reduced threat.

Study 5: Pregnancy and Implicit Self/Object Associations

The aim of Study 5 was to provide one final test of our hypothesis using yet another operationalization of literal objectification. Here, rather than relying on self-reported attributions, we assessed automatic associations between the self and objects using an implicit association test (IAT; Greenwald, McGhee, & Schwartz, 1998). The IAT has been used in a variety of social psychological research and, critical to the current study, is a valid way of assessing implicit self-concept (i.e., the strength of association between the self and related attributes; Greenwald et al., 2002; Greenwald & Farnham, 2000). Further, in many cases the IAT has been shown to be a better predictor of behavior than explicit self-report measures, suggesting that it taps into key aspects of a person's attitudes (Asendorpf, Banse, & Mücke, 2002).

We employed the same pregnancy prime used in Studies 1 and 3, and we hypothesized that women shown the pregnant image would more quickly associate self words (e.g., "me," "I") with object words (e.g., "tool," "thing") relative to human words (e.g., "person," "individual") after being primed with mortality. We expected that mortality salience would have no effect on self/object associations for women in the non-pregnant image condition, and men in either the pregnant or non-pregnant image conditions.

Method

Participants and procedure. One hundred twenty-five participants, recruited online through Amazon mTurk and compensated $0.35 for their participation, took part in the study. The sample consisted of 58 males and 67 females. Participants ranged in age from 19 to 70 years (*M* age = 36.95 years, *SD* = 12.43) and were 76% Caucasian, 8% Black, 6% Asian/Pacific Islander, 3% Hispanic, and 7% other/more than one race. All materials were completed online. Participants were told the study was intended to assess personality and attitudes as well as how people form first impressions. They were also told the study would involve completing a cognitive categorization task.

Materials.

Mortality salience prime. To prime mortality, we again used the open-ended essay questions regarding the feelings and emotions associated with one's own death, or experiencing intense pain, used in the previous studies. This was followed by the 60-item mood assessment (PANAS-X; Watson & Clark, 1994) to serve as a delay and assess affect.

Pregnancy prime. To prime female reproduction, participants were shown the images used in Studies 1 and 3, depicting the same

woman, either pregnant or prior to pregnancy. We again assessed mood using the 20-item measure (PANAS; Watson et al., 1988) following the pregnancy prime.

Implicit associations. We measured literal objectification using an IAT. Rudman and Mescher (2012) used the IAT to assess the (literal) objectification of others, and we partially based our design and stimuli on this study. In our task, participants sorted 16 stimuli words representing the categories "Object" (words: object, tool, device, thing), "Human" (words: human, individual, person, citizen), "Me" (words: me, self, my, myself), and "Others" (words: others, they, them, theirs). The test consisted of seven blocks. The first two blocks were evaluative training blocks in which participants were presented with a single target category ("Me"; "Others") on each side of the screen and were instructed to sort the center stimuli words into the appropriate category using either the "e" key or the "i" key. They were told that the goal of the task is to respond as quickly and accurately as possible.

In the third and fourth blocks, the target categories were paired with the attribute categories (e.g., "Me OR Object"; "Others OR Human"). In the fifth block, the target categories ("Me"; "Others") switched sides, and participants completed another single category training block. The sixth and seventh blocks again had the target and attribute categories paired, but the pairing order was reversed from Blocks 3 and 4 (e.g., "Others OR Object"; "Me OR Human"). The pairing order in Blocks 3/4 and 6/7 was counterbalanced between participants.

Demographics. Following the IAT, participants completed some basic demographic questionnaires.

Results

Reaction time on the IAT was computed using the *D*-score algorithm developed by Greenwald, Nosek, and Banaji (2003). This formula computes the log-transformed mean difference in reaction time between compatible and incompatible trials. The IAT effect is the difference in response latency on tasks associating me + object, and me + human, with higher scores indicating faster associations of the self with objects, compared to humans (note this also indicates faster associations of others with humans, compared to objects). *D* scores were then analyzed using a 2 (Salience: mortality vs. pain) × 2 (Image: pregnant vs. non-pregnant) × 2 (Gender: male vs. female) ANOVA. Only the predicted Salience × Image × Gender interaction emerged, $F(1, 117) = 4.28$, $p < .05$, $\eta_p^2 = .035$. To deconstruct this interaction, simple effects analyses were conducted. Results showed that for women in the pregnant image condition, mortality salience significantly increased reaction time, $F(1, 117) = 5.15$, $p < .05$, $\eta_p^2 = .042$, indicating relatively faster associations of self-related concepts with object-related concepts, compared to those primed with pain. There was no effect of mortality salience for women shown the non-pregnant image ($p = .92$). Further, mortality salience did not significantly influences men's reaction time scores in either the pregnant ($p = .89$) or non-pregnant ($p = .14$) image conditions (these means are presented in Figure 7).[7]

Discussion

The results of Study 5 demonstrate additional support for our theoretical position using a different, and well-validated, measure (Greenwald et al., 2002; Greenwald & Farnham, 2000). We found that women shown the pregnant image and primed with mortality were relatively faster in implicitly associating the self with objects (and slower in associating the self with human concepts), compared to those primed with pain. This is consistent with the results of Studies 1–4 but depicts literal objectification on a more automatic level, relying on reaction times in contrast to self-report, which often are stronger predictors of behavior (Asendorpf et al., 2002). Furthermore, consistent with Study 4, these findings extend the denial of humanness demonstrated in Studies 1–3 to a direct association of the self with objects.

General Discussion

Together, these findings provide empirical backing for the position that self-objectification can serve as a defense against an existential threat posed by the reproductive features of women's bodies. Across five studies and three different aspects of female reproductive functioning—pregnancy, menstruation, and breastfeeding—reminders of mortality led women, but not men, to respond in a manner indicative of a more object-like, less human, view of the self.

Literal objectification was operationalized both as a denial of humanness and directly as an association with objects. Studies 1–3 relied on Haslam's (2006) conceptualization of human nature, which pits attributions of human nature on one end of a continuum of person perceptions, and objects at the other. In addition, the preliminary study found that human nature traits are associated with perceived mortality. Thus, denying one's human nature is indicative of perceiving the self as an object (Loughnan & Haslam, 2007; Loughnan et al., 2009) and as immortal. Studies 4 and 5 validated this interpretation by replicating the first three studies using measures assessing both the implicit and more explicit association of the self with objects. In addition, Study 4 demonstrated that literal self-objectification mediates reactions to subsequent death-related stimuli in a manner suggestive of psychological distancing form death-related concerns. Taken together, these findings provide converging support for our hypothesis that women's self-objectification, defined in a very literal sense, is fueled by, and helps manage, existential concerns engendered by their procreating, lactating, menstruating bodies.

Literal Objectification and Animalistic Dehumanization

Studies 1 and 2 also provide an important distinction between objectification and another type of dehumanization: animalization. Consistent with research demonstrating that mechanistic and animalistic dehumanization are distinct (Haslam et al., 2005; Rudman & Mescher, 2012), even at a basic neural level (Jack, Dawson, & Norr, 2013), and with theoretical (Haslam, 2006; Nussbaum, 1995) and empirical evidence (e.g., Loughnan et al., 2009) that it is the

[7] We also examined the effect of pairing order and found a main effect, $F(1, 112) = 11.56$, $p < .01$, with participants in the first-order pairing (i.e., *me + object* paired first) scoring higher ($M = -0.301$, $SD = 0.361$) than those in the second-order pairing ($M = -0.527$, $SD = 0.301$); critically though, order did not interact with the significant Salience × Image × Gender interaction ($p = .39$).

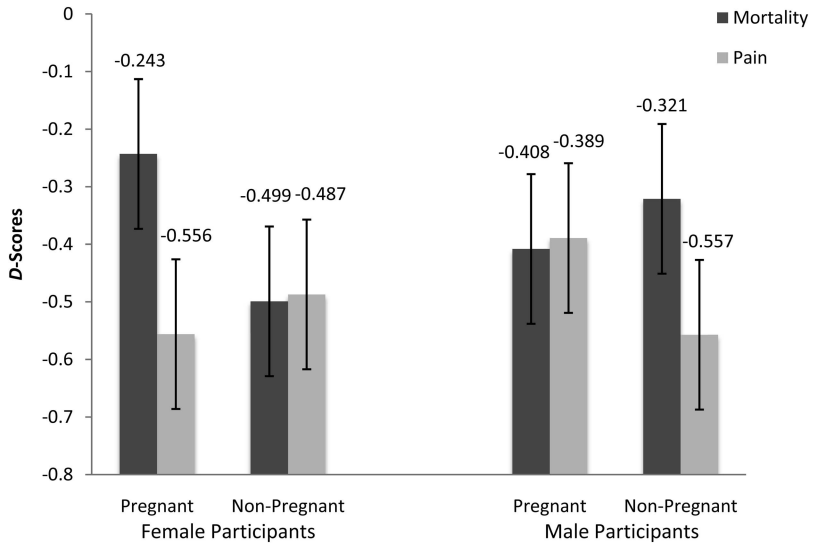


Figure 7. Reaction time (*D* scores) as a function of mortality salience and pregnancy prime. Error bars represent the standard error of the mean.

denial of human nature (and not animalization) that is indicative of objectification, denial of humanness was uniquely affected by the conditions manipulated in this research. Although women are also clearly dehumanized by an association with animals, especially when they are sexualized (Vaes et al., 2011), we were hard pressed to make any predictions for how the manipulations employed in this research would be expected to impact such self-perceptions. On one hand, mortality salience should instigate a desire to see one's self as more uniquely human (Goldenberg et al., 2001), but, at the same time, women's reproductive behaviors may prime an association between the self and animals, and mortality salience may increase the salience of this association (e.g., Jonas et al., 2008). On the agenda for future research should be more systematic efforts to identify the conditions that promote more animalistic views of women, both self views and perceptions by others, and disentangling them from objectification (see Morris & Goldenberg, 2014).

Literal Objectification and Self-Enhancement

Our third study provided evidence that the effects in these studies could not be attributed to self-esteem concerns (derogation or enhancement) in response to mortality and reproductive reminders. Although women responded by denying themselves human nature, the correlation between their positive or negative endorsements of the traits and attributions of the traits to the self was not affected by the manipulations. Further, controlling for the valence of the traits did not affect the significance of the impact of these manipulations on literal self-objectification. Additional research also supports this position: People attribute more human nature traits to themselves regardless of the valence of the traits (Koval, Laham, Haslam, Bastian, & Whelan, 2012). Further, Study 5 utilized the IAT to specifically measure implicit self-concept (i.e., associations of the self with non-valence attribute concepts), which previous research has found to be distinct from implicit self-esteem (i.e., associations of the self with valence attribute concepts; Greenwald et al., 2002). Although mortality reminders can, and often do, instigate a need for self-esteem (Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004), it appears that when women are reminded of their role in reproduction in the context of salient mortality concerns, literal objectification is more pressing than self-enhancement.

Literal Objectification and Appearance-Focused Objectification

This approach to self-objectification among woman can be contrasted to a more traditional approach in which women focus on their body's appearance. We measured the importance placed on the body's appearance in two studies (Studies 1 and 2) and obtained inconsistent results. We suggest that although focusing on a woman's appearance is often an antecedent to objectification (e.g., Heflick & Goldenberg, 2009)—indeed the prototypical antecedent—it is not the same as literal objectification, and not a necessary component of it. Gruenfeld, Inesi, Magee, and Galinsky's (2008) research showing that conditions of power induce objectification of targets is consistent with the portrayal of objectification as independent from a focus on appearance, as is the theorizing of several other scholars (Nussbaum, 1995; Marx, 1964). The failure to find effects on the measure of appearance emphasis in Study 2, and the lack of correlation between appearance emphasis and mechanistic dehumanization in Study 1—they also were not correlated in Study 2, $r(63) = -.007$, $p > .9$—supports the assertion that literal objectification is distinct from a focus on appearance.

However, clearly women do sometimes "self-objectify" in the traditional sense; that is, women do invest in their physical appearance at the expense of their body's competence and health. It makes sense that, at least in some circumstances (such as in Study 1), women would do so in response to reminders of mortality and their role in reproduction. We suspect that, just as the pregnancy manipulation may have rendered appearance more relevant, other

situational prompts and individual differences relate to whether women invest in appearance in response to existential threats.

Research supports this conclusion. For example, primes emphasizing the importance of particular appearance standards (e.g., tan skin) and individual differences in how much women base their self-esteem on such standards moderate intentions to engage in relevant (health-risk) behaviors (e.g., tanning) in response to mortality salience (e.g., Cox et al., 2009). Body self-esteem has been found to moderate both genders' identification with their body in response to mortality salience (Goldenberg, McCoy, et al., 2000); and in the study conducted by Grabe et al. (2005), although women in general scored higher on the traditional measure of self-objectification (the SOQ) after mortality salience, among both men and women the degree that self-esteem was contingent on appearance moderated this response. Moreover, only women who place high value on their appearance (i.e., with high trait SOQ scores) respond favorably to appearance-oriented stimuli (e.g., a *Sports Illustrated Swimsuit Issue* magazine cover) after mortality reminders (Goldenberg et al., 2011), and only for these women do such stimuli seem to ameliorate existential concerns (Morris, Cooper, Goldenberg, Arndt, & Routledge, 2013). Finally, in Roberts et al. (2002), the tendency to place more value on women's appearance (relative to competence and health) in response to the dropped tampon was moderated by gender schematicity; only participants conforming to traditional gender roles exhibited this effect. Thus, the evidence for appearance striving in response to existential threat is conditional—it is only some women, in some circumstances, for whom appearance seems to provide a viable route to terror management. In contrast, it makes sense that literal objectification would facilitate death denial across the board.

Literal Objectification and the Management of Death-Related Concerns

In addition to finding increased literal objectification in response to the reproduction and mortality primes, we found evidence that this tendency extenuated responsiveness to subsequent death-related stimuli. In Study 4, when women self-objectified in response to reproduction and mortality priming, they subsequently spent less time writing about their mortality in response to an open-ended essay prompt. Although the mediated moderation analysis on death thought accessibility was not significant in Study 3, we did observe a negative correlation between literal self-objectification and death thought accessibility in the condition where women literally objectified in response to reminders of female reproduction and death. It is possible that literal objectification mediated subsequent death-related responses in Study 4 and not Study 3 on account of the more direct operationalization of literal objectification (i.e., associating the self with an object rather than denying one's human nature). It is also possible the inconsistency in the findings is a result of differences in what the two indices of death-related concerns actually measure. The word-fragment completion task measures cognitive accessibility of death thoughts (which may or may not reflect mortality concerns; Routledge & Juhl, 2010). In contrast, time spent responding to a death prompt more likely reflects the degree that concerns about death are activated and pressing.

Interestingly, in another study measuring the amount of time individuals spent writing about death, participants high in trait mindfulness were found to spend longer writing about their death (Niemiec et al., 2010). This, the authors suggested, is because mindfulness—the acute awareness, openness and acceptance of one's internal and external states of being—allows individuals to process threatening information in an unbiased way, including one's own mortality. In many ways, literal self-objectification represents the exact opposite of mindfulness. Whereas mindfulness provides a pathway to process and cope with thoughts of death, we suspect that literal objectification provides a (presumably temporary) means to distance from and dampen the threat associated with mortality. While the results of Studies 3 and 4 provide insight into the influence of literal objectification on subsequent responses to death-related stimuli, clearly more research is necessary to understand the relationship between literal objectification and the management of death-related concerns.

Implications of Literal Objectification for Women

The findings of these studies also have significant implications for women's well-being by connecting the evidence of an increased willingness to harm an objectified person (Loughnan et al., 2010; Rudman & Mescher, 2012) to the self. For instance, other people have less concern for, and show increased blaming of, female rape victims when they are objectified (Loughnan, Pina, Vasquez, & Puvia, 2013); they also show less concern for the objectified target's physical pain (Loughnan et al., 2010). By focusing on self-objectification, defined in a more literal sense, the current studies may help to shed light on situations in which women harm themselves (e.g., self-mutilation) or put themselves in situations where they may experience significant harm (e.g., prostitution), by suggesting a mechanism that could facilitate such behavior. Even the seemingly benign, everyday experiences of women in which they use painful hot wax to remove hair from their bodies, undergo unnecessary cosmetic surgical procedures, or even have makeup permanently tattooed on their faces may be understood, in part, by these findings. To the extent that objectification is conceptualized as a denial of humanness in favor of an association with objects and other inanimate entities (Loughnan & Haslam, 2007), it stands to reason that women may be more willing and more able to engage in such behaviors because objects do not possess the ability to feel pain, feel hurt, or experience harm. Such theorizing could be tested by examining whether the manipulations in these studies also contribute a women's willingness to experience painful situations.

Conclusion

Clearly, questions still remain; we have suggested just a few of the possible next research steps. However, in integrating research on self-objectification with theoretical and empirical evidence for objectification defined in a very literal sense, and in offering terror management as a model to explain a motivation for such tendencies, this work takes an important first conceptual step. In short, considering women's menstruation, pregnancy, and breastfeeding to represent a trio of terror that can be managed by literal objectification sets the stages for greater insight into why, and under what conditions, women may be apt to deny their own humanness, and err toward being an object instead. For despite the negative ramification of perceiving the self as an object, there is a psychological perk—objects are not alive and therefore cannot die.

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