

TREATING OBJECTS LIKE WOMEN: THE IMPACT OF TERROR MANAGEMENT AND  
OBJECTIFICATION ON THE PERCEPTION OF WOMEN'S FACES

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**Title**

Treating Objects like Women: The Impact of Terror Management and  
Objectification on the Perception of Women's Faces

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**MASTER OF SCIENCE**

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## **ABSTRACT**

According to terror management theory, humans are threatened by the awareness of death and counter this threat by investing in cultural systems that make them feel like they are more than mortal animals. Based on this proposition, it has been argued that women's bodies pose a unique existential threat, as they remind humans of their similarity to other biological organisms. However, no research thus far has examined how death awareness impacts perceptual assessments of women. The current study examined the effect of heightened death-awareness on perceptions of women's faces, utilizing face-morphing techniques that create a range of artificial-to-real faces. Results indicated that following a death-awareness induction, participants perceived artificial female faces as less artificial, but not necessarily more attractive. MS did not predict perceptions of male faces. These results suggest that existential concerns about death have an impact on perceptual assessments of women.

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## **DEDICATION**

I would like to dedicate this manuscript to my endlessly loving and patient parents, Margaret and David Roylance, as well as to my sister and my brothers, because family is everything. And to all my dear friends back home, thank you for being there when I needed you.

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## INTRODUCTION

*I pity wretched Strephon blind/ to all the Charms of Female Kind;/ Should I the Queen of Love refuse,/ because she rose from stinking Ooze?"* (Swift, 129-32)

Terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) posits that human's unique awareness of eventual mortality conflicts with motivations for survival. This conflict creates the potential for crippling anxiety that people seek to avoid by incorporating themselves into self-transcendence-providing cultural systems (e.g. religion, family, politics, etc). By participating in, and perceiving themselves as valuable within these systems, people are able to maintain the belief that though the body dies, the self continues to endure, at least symbolically.

One specific way in which humans seek to achieve this sense of death-transcendence is by elevating themselves above the level of other animals. To do this, humans attempt to distance themselves from the physical and corporeal aspects of humanity that are shared with other animals (e.g. bodily products, sex, etc.) In support of this notion that people desire to elevate themselves above the level of animal physicality in response to an awareness of death, empirical studies have demonstrated that when people think about their mortality, they are more likely to be disgusted by the human body and its animal aspects (Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000).

Further studies on the impact death-awareness has on attitudes toward the human body have found that women, more so than men, are likely to be reminders of human corporeality because of their role in reproduction (Goldenberg, 2012; Goldenberg & Roberts, 2004). Research also suggests that the historically ubiquitous treatment of women as sexual objects is partially motivated by a desire to manage the threat of death awareness: objectifying women

helps disguise their creaturely nature (Grabe, Routledge, Cook, Andersen, & Arndt, 2005). In short, people desire to view themselves as more than mortal beings destined to the same transient fate as other animals, and women often serve as potent reminders of the animal nature of humanity. That is, women menstruate, give birth, and breast-feed. Therefore, cultures go to great lengths to camouflage the animal aspects of the female body, which can result in the objectification of women. Research, however, has yet to examine how death-awareness impacts how people actually perceive women. Death-reminders increase the likelihood that a woman will be objectified, but could death-reminders additionally increase people's preference for or assessment of women who more closely resemble an object? Specifically, since heightened death-awareness increases the discomfort with the animal aspects of femininity, could heightened death-awareness drive individuals to prefer the appearance of women whose faces are altered via computer technology to appear inhuman or "plastic" (i.e., less mortal), or to rate this kind of face as more real than it is? The current research investigated whether priming individuals to think about death impacts the perception of and preference for artificial, as opposed to natural, female faces.

### **Terror Management Theory**

According to TMT (Greenberg et al., 1986), human beings are burdened with two incongruent cognitions—that we desire self-preservation, and yet, realize that death is certain. Our higher-level cognitive abilities render us aware of mortality, which has the potential to generate a significant amount of anxiety. TMT posits that humans seek to alleviate this anxiety by creating cultural belief systems or worldviews that provide a sense of death transcendence (Greenberg et al., 1990). For example, religious worldviews provide perceptions of literal immortality (i.e., belief in an afterlife). Additionally, religious and secular worldviews provide

perceptions of symbolic immortality by promoting the belief that though individuals die, part of who they are lives on through their families, social and cultural identifications, and personal accomplishments.

Dozens of studies have supported the proposal that people turn to cultural worldviews to manage concerns about mortality. Many of these studies employ the mortality salience paradigm (MS; Rosenblatt, Greenberg, Solomon, Pyszczynski & Lyon, 1989) in which an individual is instructed to reflect on his or her own death (or a control topic) and then given the opportunity to display investment in a cultural worldview. If one function of cultural worldviews is to buffer concerns about death, then thinking about the reality of death, relative to thinking about a topic not related to death, should increase people's investment in their worldviews. For example, Greenberg et al. (1990) found that MS increased Christians' favorable assessments of an ingroup member (another Christian) while increasing negative assessments of an outgroup member (a Jewish person). In this case, a death reminder increased people's desire to cling more strongly to their own religious worldview, and to reject differing worldviews. Additionally, since MS increases an individual's investment in his or her particular worldview, then MS should increase individuals' tendency to derogate those who fail to live up to the proper standards of that worldview. For example, Rosenblatt et al. (1989) found that MS increased court judges' tendency to recommend harsh punishments for a prostitute. Judges are invested in the worldview of being upholders of the law and thus prostitutes (law violators) represent a threat to that worldview.

TMT also proposes that self-esteem plays a critical role in the functional capacity of cultural worldviews. Individuals' belief that their cultural worldviews will grant them immortality rests on whether they feel like valuable members of their cultural systems, and self-

esteem is the measure indicating one's self-perceived value (Greenberg, 2008). Thus, when people are reminded of their mortality, in addition to showing allegiance to a cultural worldview, they should demonstrate increased efforts to attain and protect self-esteem. Consistent with this proposal, studies evidence that MS increases self-esteem striving. For example, Ben-Ari, Florian, and Mikulincer (1999) observed that MS increased risky driving (in a driving simulator) among individuals who indicated that driving ability was an important part of their self-esteem. Similarly, Routledge, Arndt, & Goldenberg (2004) found that MS increased desire to sun tan among women who indicated that having tanned skin was an important component of their self-esteem.

Other studies also demonstrate that self-esteem helps mitigate concerns about death by showing that high self-esteem buffers the negative psychological effects caused by death-related cognition. For example, Routledge et al. (2010) found that MS negatively impacts psychological adjustment for those low, but not high in trait self-esteem. Specifically, MS decreases indicators of adaptive psychological functioning (satisfaction with life, meaning in life, etc.) while increasing indicators of unhealthy psychological functioning (negative affect and anxiety), but not for those high in self-esteem. Overall, this evidence suggests that in order to derive existential comfort from a worldview, a person must feel confident that he or she is a person who is worthy and valuable within the framework of that worldview.

### **Terror Management and the Body**

Though TMT was originally focused on the death-anxiety buffering functions of cultural worldviews and self-esteem, subsequent research expanded the theory by exploring how the human body is implicated in people's attempts to deny mortality. Goldenberg and colleagues (2000) began by suggesting that the physical body is particularly problematic in people's

attempts to perceive themselves as more than mortal because though the body is the physical vessel on which we rely in order to live, it is also the part of us that is destined to die. The authors go on to suggest that this ambivalence towards the physical body provides a unique source of existential anxiety, thereby accounting for people's attempts to elevate the body to a more abstract and symbolic being, as opposed to the physical organic matter that it is.

One way that we mitigate body-relevant anxiety is by striving to perceive ourselves as more than mere animals. Our physical bodies tie us to our animal nature, and our bodily processes serve to remind us of our similarities to animals. Consequently, when people think of themselves as similar to animals, it compromises their ability to feel superior and unique. Our animality, or "creatureliness" (Goldenberg et al., 2000) thus undermines the belief that humans are more than mortal. It reminds us that we, like all living organisms, are transient beings. To test this proposition, Goldenberg et al. (2001) presented individuals with an MS prime, or an aversive, but not death-relevant prime (i.e. pain). They were then presented with two essays, supposedly written by undergraduate honors students. One essay emphasized the similarities between humans and animals, while the other emphasized that humans are different from, and superior to animals. The results demonstrated that MS compared to pain resulted in greater liking of the author of the animal-human distinctiveness essay. This finding demonstrates that heightened death-awareness increases the extent to which humans prefer to think of themselves as distinct from and superior to other animals.

Concern about being adequately elevated above animals would explain, in part, human's disgust of natural bodily processes, since these are core commonalities that exist between humans and animals (e.g. sex, excretion). Though disgust serves an adaptive function by signaling that something in the environment is unfit for consumption, Rozin, Haidt and

McCauley (1993) argued that this emotion also functions as a way for humans to distance themselves from reminders of their animal nature. Specifically, the authors suggested that the body and its products are existentially threatening because they remind humans of their innate similarities to animals and thus, their mortal limitations. In support of this proposal, Goldenberg et al. (2001) found that MS relative to a pain control condition increased aversion to disgust-eliciting bodily products (e.g. vomit and feces). When death-awareness is heightened, people are uncomfortable being reminded of the qualities that highlight their physical nature.

Together these results indicate that another aspect of people's desire to deny the finality of death is manifested in disgust towards the physical body, since the body is the piece of us that is ultimately mortal and thus threatening. Interestingly though, reactions towards the body following the existential threat of death-related cognition may vary as a function of how people feel about their bodies. For some individuals, being beautiful and having an attractive body is a critical aspect of self-concept and self-esteem. Such body-esteem would render the physical body a source of self-value, as opposed to threat. Indeed, Goldenberg et al. (2000) found that among those with high body-related self-esteem, MS increased identification with the physical body, interest in sex, and appearance monitoring. These results point to a more complex relationship between immortality-striving and the physical body. The body is simultaneously a source of existential anxiety and a potential source of self-esteem, and thus symbolic death-transcendence. The ability of the body to provide self-esteem though, would theoretically hinge on whether or not the body was believed to be adequately meeting cultural standards of value. However, as will be discussed next, cultural standards of value related to the body can prove problematic for psychological health and well-being.

## **Objectification Theory**

Objectification theory (Fredrickson & Roberts, 1997) provides a theoretical framework for understanding the unique experiences women have in a culture that frequently reduces them to the status of an object. Through experiences of sexual objectification, a woman comes to be viewed as a body as opposed to a person, whose value exclusively resides in her body's attractiveness, usefulness, and potential for consumption by others. The theory proposes that in our society, women are frequently socialized to internalize the perspective of outsiders as opposed to their own when evaluating themselves. Women are trained to be vigilant to their status as objects and how they are viewed by others—a process known as self-objectification.

Objectification theory proposes that objectifying experiences of women may account for negative health outcomes that occur more predominantly among women. Indeed, a substantial body of correlational and experimental research supports the notion that for women, self-objectification and objectifying experiences are associated with a myriad of poor health outcomes, such as depression (Szymanski & Henning, 2007), disordered and restrained eating (Tiggerman & Kuring, 2004; Fredrickson, Roberts, Noll, Quinn & Twenge, 1998), anxiety (Slater & Tiggerman, 2002; Tiggerman, 2013), as well as deficits in well-being and satisfaction with life (Mercurio & Landry, 2008). Fredrickson and Roberts (1997) originally posited that the two potential mechanisms through which objectification could lead to such negative mental health outcomes are: actual sexual victimization, and an increase in self-focused body monitoring.

Subsequent research on the mediational pathways from objectification to mental health has focused on the pernicious effect of increased body monitoring due to objectification. In particular, research has established that increased appearance and body-monitoring due to

objectification positively correlates with increased feelings of body shame and self-focused rumination, which in turn both predict disordered eating and depression (Noll & Fredrickson, 1998; Grabe, Hyde & Lindberg, 2007). Studies using both self-reported baseline levels of self-objectification (Noll & Fredrickson, 1998) and experimentally manipulated experiences of objectification (Fredrickson et al., 1998) have reliably indicated that objectification leads to increased feelings of shame. Since shame is a strong predictor of poor mental health outcomes (Matos, Pinto-Gouveia & Duarte, 2013; Troop & Redshaw, 2012), it has been argued that the relationship between objectification and poor mental health outcomes is due to the mediating role of self-focus, and the feelings of shame that accompany it in so many women (Wright, O’Leary & Balkin, 1989).

Thus, objectification theory offers an account as to why women may tend to experience lessened self-esteem due to objectifying experiences. As previously stated, objectification tends to heighten self-monitoring and shame—both factors associated with low self-esteem (Choma et al., 2010). Furthermore, self-esteem has been found to be another mediator in the relationship that exists between objectification, self-focused attention and poor mental health outcomes (Tylka & Sabik, 2010). Thus, experiences of objectification have profound consequences on women’s level of self-esteem, and their overall health.

As stated earlier, self-esteem plays a crucial role in the terror management framework. According to TMT, self-esteem serves as an indicator that an individual is a valuable member of a cherished cultural system, and therefore, deserving of death-transcendence. Thus, a lack of self-esteem serves as an indicator that one is not good enough, or not valuable enough within a cultural system. On the other hand, within the objectification context, the experience of shame occurs when an individual perceives herself as falling short of some crucial superficial or



physical standard (Calogero & Pina, 2011). The resulting deficit in self-esteem could thus be conceptualized as an indicator to an individual that he or she must fall more in line with these particular standards. In the case of objectified women, it is the standard of beautification and perfection that objectifying experiences place on them. Therefore, TMT and objectification theory posit complementary perspectives on the function of self-esteem. That is to say, both theories explain self-esteem as the result of an individual's attempt to live up to a perceived important standard. Failures to appropriately succeed at a given standard results in lessened self-esteem, and all the accompanying negative health consequences.

### **Creatureliness, Objectification and Women in Terror Management**

Drawing on previous studies indicating that mortality concerns lead to negative responses to the body, and research on the objectification of women's bodies, researchers have begun considering the potential for women's bodies to serve as a particularly potent existential threat. In conjunction with objectification theory, this line of work attempts to identify death-awareness as a contributing factor in why women are more frequently the subject of objectification. Goldenberg and Roberts (2004) proposed a theoretical account for why women have been treated differently than men throughout history, in that they are derogated as inferior, and yet worshipped as objects of beauty. The authors set forth a breadth of evidence from history and anthropology, detailing how women serve as reminders of the animal aspects of humanity, a concept dubbed "creatureliness". Women as the bearers of life are ironically also reminders of the fact that we are born of a body, and therefore mortal. That is, the authors proposed that women became a particularly potent source of existential threat because their role in reproduction reminds us of our animal nature. Thus a desire to deny mortality is believed to be partially responsible for the objectification and differential treatment of women throughout

history and across societies. According to the authors, a woman who has been reduced to an object has ceased to have her existentially threatening corporeal aspects, rendering her existentially “safe”.

TMT research has sought to directly consider the role of death-awareness in the objectification of women. For example, Grabe et al. (2005) discovered that MS increased self-objectification among women, suggesting that being reduced to an object as opposed to a person functions to mitigate concerns about death among women. Additionally, MS led to an increase in the extent to which women objectified other women. This indicates that when experiencing existential threat, women are driven not only to objectify themselves as an individual, but to objectify all women. Therefore it is not simply the case that MS drives women to render themselves individually less human and thus less creaturely. MS also motivates women to more generally objectify their gender.

In 2002, Roberts, Goldenberg, Power and Pyszczynski conducted a series of studies to test the proposal that for both men and women, reminders of female creatureliness would be perceived as threatening. They specifically hypothesized that a woman who fails to properly mask her feminine bodily functions would be treated as an object of derision. To test this they used two conditions: one in which a female confederate would drop a tampon, and a control in which she drops a hairclip. The authors proposed that both the tampon and the hairclip would serve as reminders of femininity, but that only the tampon would be a reminder of female creatureliness, and feminine bodily processes. Thus, the tampon should be uniquely threatening. What they found was that a woman who dropped a tampon in front of another individual was rated as less competent and less likeable, compared to the woman who dropped the hairclip. Additionally, individuals who witnessed a woman dropping a tampon tended to objectify women

in general more than those in a control group. This work demonstrates that a woman who fails to adequately hide her creatureliness is viewed negatively. Further, witnessing this reminder of creatureliness motivates efforts to objectify all women.

In terms of how specific bodily functions associated with the female body and reproduction may be threatening, Goldenberg, Cox, Arndt and Goplen (2007) found that priming human-animal continuity by having participants read the essay previously described about the similarities humans share with other animals increased dislike for a noticeably pregnant woman. As stated earlier, the concept of humans as similar to animals is existentially threatening, and frequently induces disgust. Thus, priming human-animal continuity should induce a desire to revile any reminders of humans' animal nature. A pregnant woman in this case potently evokes bodily processes (i.e. reproduction and birth itself) as well as our physical and mortal nature. Additionally, Cox et al. (2007) found that MS and animal-similarity primes both led to increased negative reactions towards a breast-feeding woman. Again, breast-feeding, like pregnancy, is a bodily process that highlights the animality of humanity. That is, breast-feeding reminds us that all humans are born and nourished the same way animals are, and are by the same token, mortal just as animals are.

Furthermore, existential concerns may not just drive attitudes towards women who evoke creatureliness; they may also impact health behaviors among women. Goldenberg, Arndt, Hart and Routledge (2008) found that women exposed to an MS condition, who then read an essay about human-animals similarity reported less intentions to perform breast self-exams (BSEs). Critically, Goldenberg and colleagues found that these effects did not occur as a result of subjective worry about cancer. Obviously a breast exam may be threatening because it induces worry about death by cancer—for these results though, this was not the case. Thus it would

seem that a breast exam is threatening, in part, because it functions as a reminder of female creatureliness. Again, when exposed to MS, women desire to distance themselves from their physical and animal nature. In this case, despite the possibility for a breast exam to be a potentially life-saving measure, women avoided it when mortality and creatureliness were salient.

MS also makes women feel more discomfort with a bodily function not exclusive to women—eating. Specifically, Goldenberg, Arndt, Hart and Brown (2005) found that MS increased a woman's likelihood to engage in restrictive eating. Additionally, MS made women of higher BMI more likely to perceive that they have failed at achieving a valuable cultural standard typically focused on women—namely thinness. Together, these results suggest that MS increases the likelihood that a woman will be hyperaware of her own body as an impediment to attaining a desired status within a cultural system. Additionally, the desire to deny creatureliness and mortality not only impacts how a woman may view herself (and consequently her self-esteem) but also how people in general view a woman. A woman who is accepting of the animal aspects of her femininity is to be reviled and rejected, and a woman who fails to adequately camouflage her creatureliness by living up to cultural standards that ultimately objectify women is to feel ashamed and guilty.

Beyond how women may view themselves, existential motives may impact how men view women in terms of attractiveness. Landau et al. (2006) found that MS decreased men's likelihood of finding attractive, and sexually pursuing, a sexually alluring woman (i.e., a woman who flaunts her sexuality). These results suggest that death awareness might drive men away from desiring a woman who evokes physicality, even if she is objectively attractive.

In all, research derived from TMT demonstrates that death-aware humans strive to avoid being reminded of their animal nature. Humans want to be more than mere mortals confined by the limitations of biological existence. In addition, combining ideas from TMT and objectification theory, research indicates that women are existentially threatening because of their role in reproduction: women serve as reminders that humans are physical and thus mortal animals. When thoughts of death are activated or people are presented with information highlighting how humans are similar to other animals, women (1) are more objectified by others, (2) objectify themselves to a greater extent, (3) engage in more restrictive eating, and (4) are derogated if they reveal any of their “animal” aspects (e.g., breast-feeding, pregnancy, sexual allure).

### **The Present Research**

For the current study, I aimed to incorporate cognitive perceptual processes into the theoretical framework provided by TMT and objectification theory. Specifically, I sought to provide evidence that mortality concerns may drive differential perceptual processing of women’s faces. Literature on animacy perceptions of computer-generated-imagery (CGI) human faces indicates that there is a point in the real-artificial morphing spectrum in which artificial human faces cease to be perceived as animate (Looser & Wheatler, 2010; Balas & Horski, 2012). Research on the perception of faces has also found that clearly artificial faces (i.e. completely CGI-generated faces) make people uncomfortable when there is too much human resemblance, a phenomenon referred to as the “uncanny valley” (MacDorman, Green, Ho, & Koch, 2009). Thus, when asked to rate a series of faces that range from completely real to completely CGI, there appears to be a cutoff where people no longer perceive animacy. Faces that are artificial, but too close to this threshold are reliably assessed as uncanny, or “creepy”.

I believe there is sufficient justification for the incorporation of facial perception into the literature on creatureliness concerns and the attitudes towards women. Empirical research on both terror management and objectification have established that there is an existential component to the standards of beauty we place on women, such that a woman who fails to properly mask her creatureliness threatens to undermine human efforts to feel more than mortal. Such standards demand that women mask their animal nature in favor of a more manicured, perfected and polished version of femininity. Perhaps an artificial or CGI-face (akin to the now ubiquitous magazine-standard photoshopped imagery) might fall into this category of so-called perfection. I therefore posit that death-related cognition, and the resulting heightened importance of standards of beauty for women, may impact the point in the morphing spectrum at which a woman's face is perceived as artificial or not and desirable. Specifically, I believe that when reminded of death, people may be more likely to perceive a more highly morphed and unnatural female face as less artificial and more attractive. After a death reminder, people are motivated to objectify women and to divorce them from any connection to animality. Despite the possibility for unnatural CGI faces to be "uncanny" and discomfiting, these faces make women look more like objects and less like living beings that breathe, sweat, bleed, age, and die. Thus the current study was primarily concerned with incorporating facial perception into the current literature examining the existential underpinnings of the objectification of women.

Hypotheses: Mortality salience, compared to a control condition, will lead to more highly morphed female faces being rated as less artificial and more attractive. No effect of MS on judgment of male faces is predicted. I do not predict any differences between female and male participants as research has demonstrated the MS effects on evaluations of women occur among

both females and males. However, gender of the participant will also be considered as a potential moderator.

## STUDY 1

### Method

#### Participants and Design

178 (89 female;  $M_{\text{age}} = 19.210$ ,  $SD_{\text{age}} = 2.311$ ) undergraduate psychology students in the North Dakota State University (NDSU) participant pool were solicited to participate in the study in exchange for course credit. The study was computer-based and programmed using MediaLab software, and all measures were assessed in private cubicles in the laboratory. All participants were debriefed as to the purpose of the study upon completion. Participation was voluntary, and participants were free to withdraw from the study at any time.

#### Materials and Procedure

Upon arriving at the laboratory, participants were informed that the study concerned the relationship between personality and social judgments. To minimize suspicion as to the study's purpose, participants completed a battery of individual difference questionnaires preceding the experimental manipulation.

**Mortality salience.** After completing the initial questionnaires, participants were randomly assigned to either receive an MS prime or an aversive, non-death control prime (i.e. physical pain; Greenberg, Solomon & Pyszczynski, 1997). As in previous research, in both conditions, participants were presented with two prompts, and asked to briefly reflect in writing on those prompts. For those in the MS condition, the first prompt read "Please briefly describe the emotions that the thought of your own death arouses in you". The second reads "Jot down, as specifically as you can, what you think will happen to you as you physically die, and once you are physically dead". For those in the control condition, the first prompt read "Please briefly describe the emotions that the thought of being in intense physical pain arouses in you". The



second read “Jot down, as specifically as you can, what you think will happen to you physically as you are in intense pain”.

**PANAS delay.** Following the experimental manipulations, participants completed the 20-item Positive and Negative Affect schedule (PANAS; Watson, Clark & Tellegen, 1988). The delay was included due to previous findings utilizing the MS paradigm indicating that MS effects are most pronounced after a distraction from death-thoughts (Greenberg, Arndt, Simon, Pyszczynski & Solomon, 2000)

**Face presentations and attractiveness/artificiality ratings.** Materials for the presentation of real and artificial morphed faces were created utilizing the same method as Balas and Horki (2012) where natural human faces are gradually combined with doll faces in 10% increments, creating a continuum from 0% artificial to 100% artificial. The materials were created using the faces of four females and four males. Each real face was gradually morphed into the doll face, resulting in 11 images for each individual face, for a total of 88 images (see images 1 and 2 for examples).

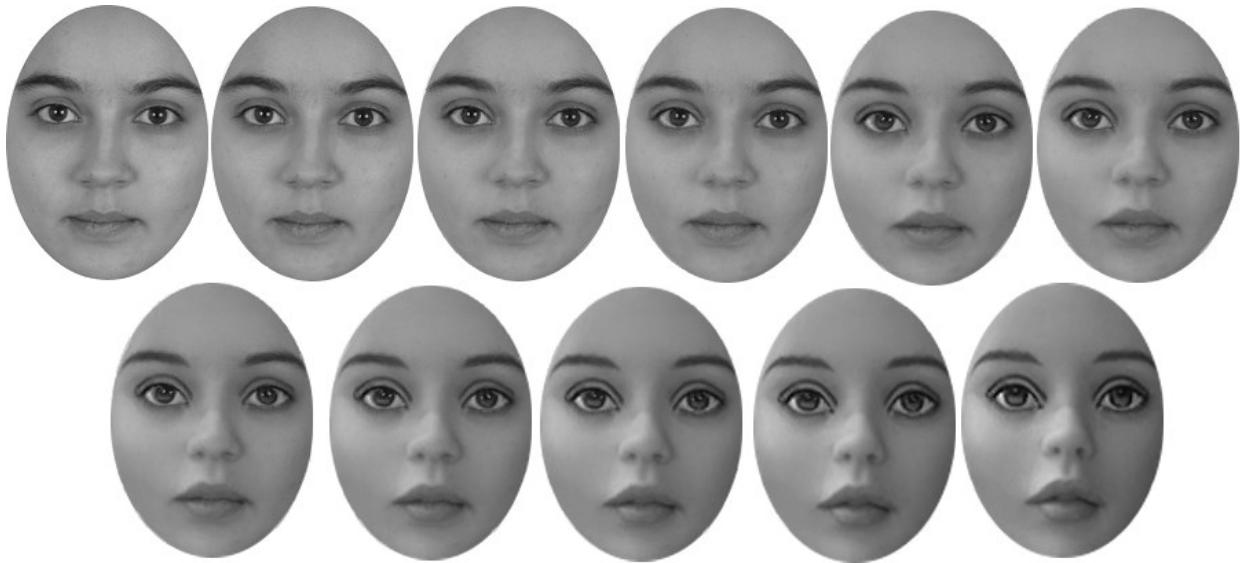


Figure 1. Complete morphing spectrum of a female face with 10% incremental increase of artificiality at each subsequent face.



Figure 2. Complete morphing spectrum of a male face with 10% incremental increase of artificiality at each subsequent face.

Participants were presented with all 88 images in completely randomized order, with each face appearing once. Each image was presented for 2000 milliseconds. Participants then had unlimited time to make an animacy judgment using a 7-point Likert scale, ranging from 1 (*not at all artificial*) to 7 (*definitely artificial*) and an attractiveness judgment using a 7-point scale, ranging from 1 (*very unattractive*) to 7 (*very attractive*).

### **Analysis and Results**

Prior to analyses, the data from five participants were excluded due to experimenter error (incorrectly delivering introductory instructions; 3 participants), not finishing the study in its entirety (1 participant), and requiring electronic assistance for an English translation (1 participant), leaving data from 173 total participants.

For each increment within the facial spectrum, an average score was computed (e.g. all the 100% artificial female/male face ratings were averaged together, all the 90% artificial female/male face ratings were averaged together, etc.) Scores for animacy and attractiveness ratings were computed separately for male and female faces, yielding a total of 11 scores for artificiality assessments for female faces; 11 scores for attractiveness assessments for female faces; 11 scores for artificiality assessments of male faces; and 11 scores for attractiveness assessments of male faces.

#### **Attractiveness**

First, I conducted a mixed model analysis of variance (ANOVA) with gender of participant (male or female) as a between subjects factor, condition (MS or pain) as a between subjects factor, and attractiveness ratings at every morphing level of male/female faces as a within subjects factor, and another two-level within subjects factor of the gender of the target faces. This four-way interaction was non-significant ( $p = .644$ ).

In order to then consider male and female target faces separately, I then conducted two mixed model ANOVAs with gender of participant (male or female) as a between subjects factor, condition (MS or pain) as a between subjects factor, and attractiveness ratings at every morphing level of male/female faces as within subjects factors, with separate ANOVAs for female and male faces. There were significant main effects of the within subjects variable of level of morphing on attractiveness ratings for both male faces ( $F(10, 1690) = 60.460, p < .001$ ) and female faces ( $F(10, 1690) = 33.161, p < .001$ ) such that attractiveness ratings rise as faces become more artificial, until a certain threshold of artificiality whereby attractiveness ratings decline steeply (see Figures 3 and 4). There were no effects of condition observed on the attractiveness ratings for male faces ( $p = .711$ ) or female faces ( $p = .880$ ). Though there was not a significant effect of gender of participant on attractiveness ratings of female faces ( $p = .321$ ), there was a significant effect of participant gender on attractiveness ratings of male faces:  $F(10, 1690) = 5.627, p < .001$  (see Figure 5). Follow-up pairwise ANOVAs indicated that this effect was the result of male participants rating male faces as less attractive than female participants at every level of the morphing spectrum—this difference was significant ( $p < .05$ ) at all morphing levels except at 70%, where it was marginal ( $p = .057$ ; means presented in Table 1). Overall, these results indicate that men assess other male faces as significantly less attractive than their female counterparts, whereas this difference does not exist when men and women are rating the attractiveness of female faces.

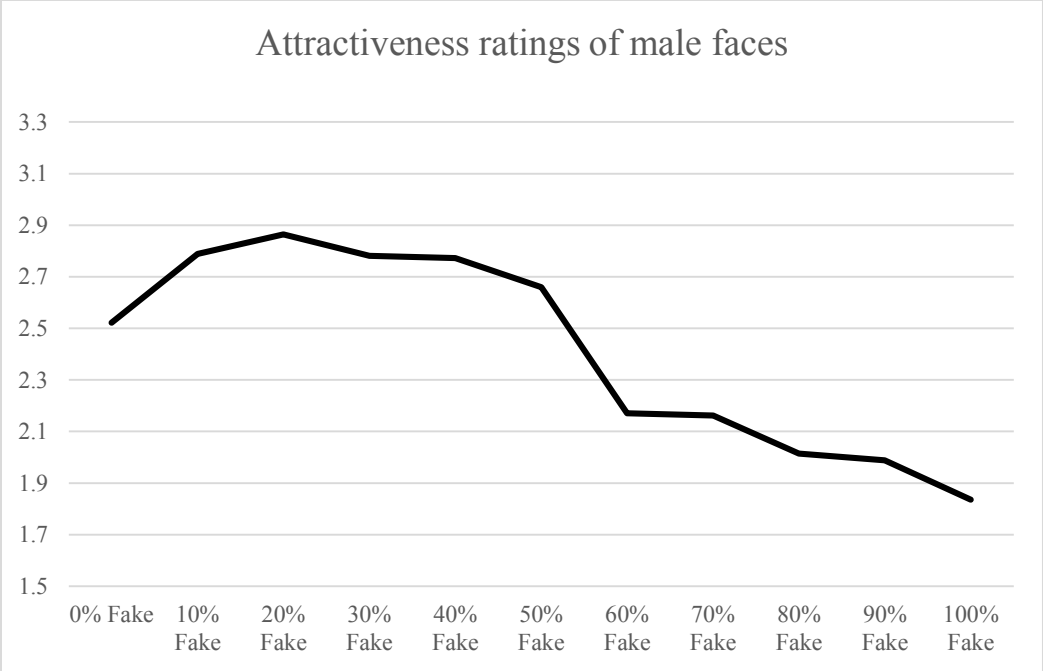


Figure 3. Attractiveness ratings of male faces across the morphing spectrum.

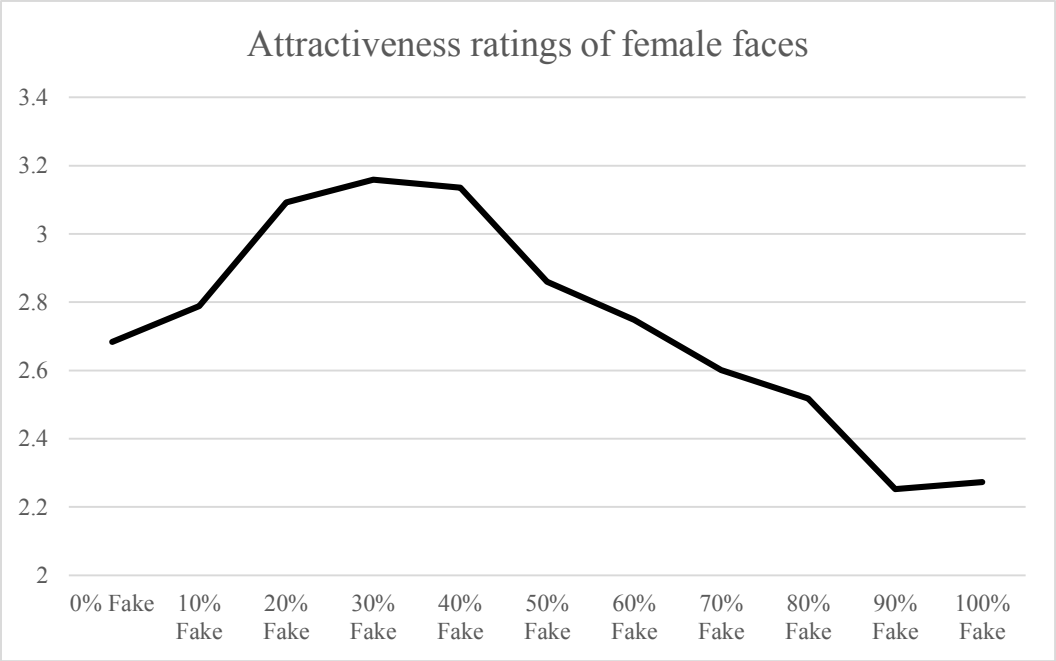


Figure 4. Attractiveness ratings of female faces across the morphing spectrum.

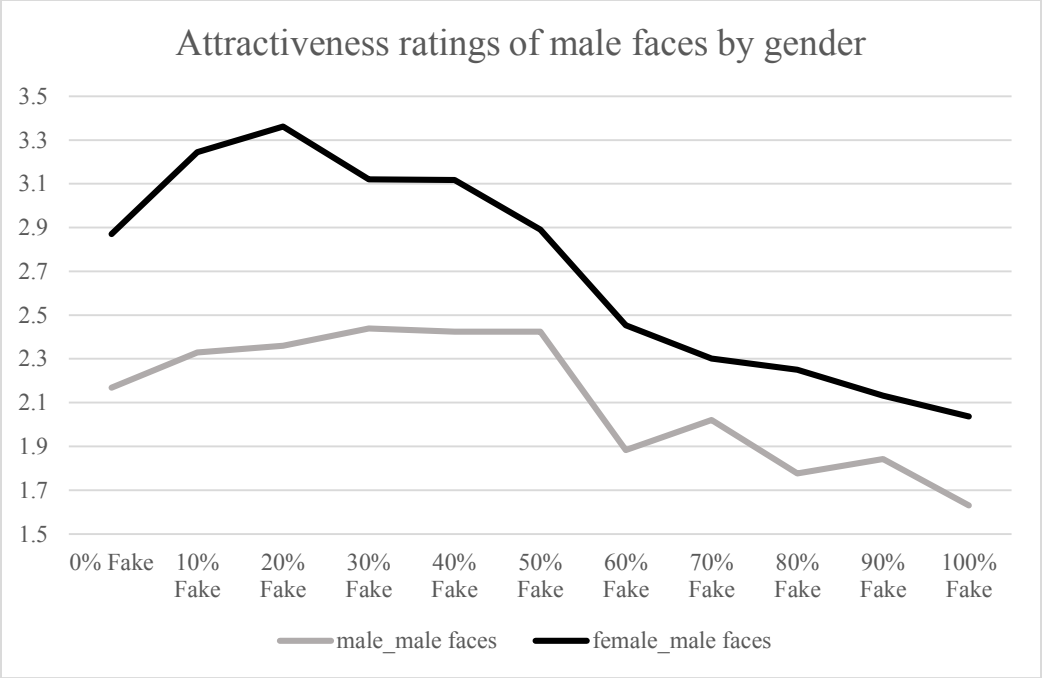


Figure 5. Attractiveness ratings of male faces by gender of participant.

Table 1. Means and standard deviations for attractiveness assessments of male faces at 11 morphing levels by gender.

	Mean	SD
Attractiveness of male faces: 0%		
Male	2.169	1.181
Female	2.871	1.2001
Attractiveness of male faces: 10%		
Male	2.329	1.293
Female	3.244	1.251
Attractiveness of male faces: 20%		
Male	2.361	1.301
Female	3.362	1.253
Attractiveness of male faces: 30%		
Male	2.429	1.165
Female	3.121	1.070
Attractiveness of male faces: 40%		
Male	2.424	1.150
Female	3.118	1.177
Attractiveness of male faces: 50%		
Male	2.424	1.096
Female	2.891	1.114
Attractiveness of male faces: 60%		
Male	1.884	1.006
Female	2.454	1.162
Attractiveness of male faces: 70%		
Male	2.020	0.913
Female	2.302	1.013
Attractiveness of male faces: 80%		
Male	1.776	1.012
Female	2.250	1.099
Attractiveness of male faces: 90%		
Male	1.843	0.924
Female	2.132	0.993
Attractiveness of male faces: 100%		
Male	1.631	0.811
Female	2.037	1.003

Differences with  $p < .05$  demarcated in gray.

There was a marginal three-way interaction on attractiveness ratings of males faces ( $p = 0.054$ ) and a significant three-way interaction on attractiveness ratings of female faces:  $F(10, 1690) = 1.882, p = .043$  (see Figure 6). Since no three-way effects were predicted, any interpretation of this effect would be speculative. Indeed, the pattern of results in Figure 6 does not conform to any consistent pattern that would be predicted by TMT. It appears that in the control condition (non-mortality salience), male participants (relative to female participants) generally find the female faces less attractive across the spectrum. In the mortality salience condition, this difference becomes less reliable across the spectrum.

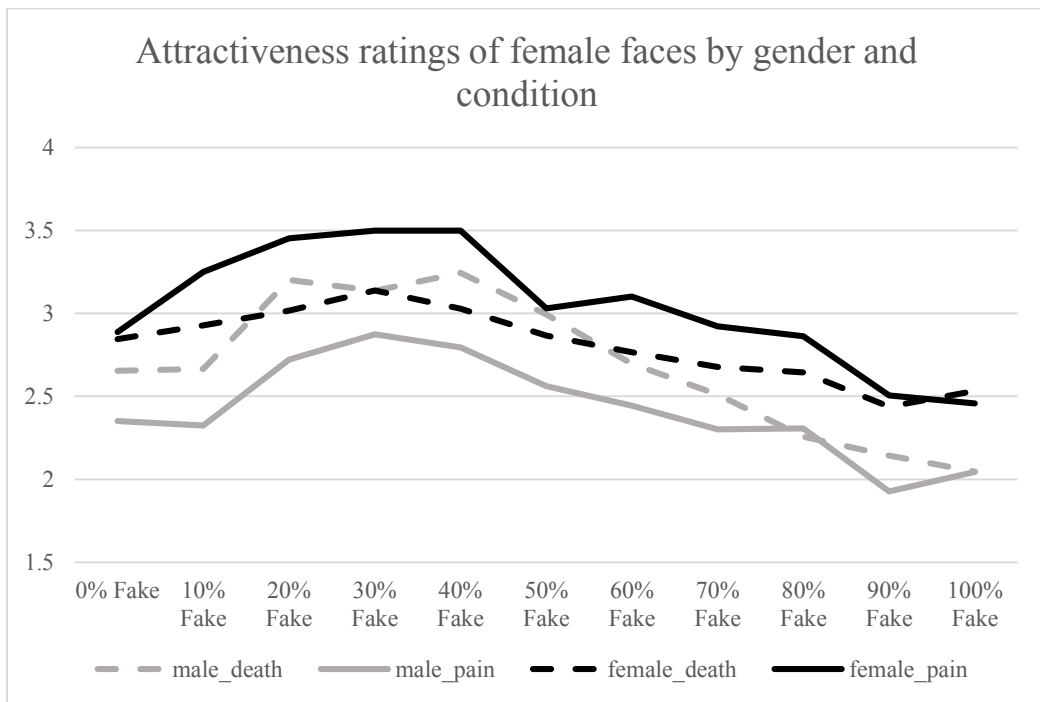


Figure 6. Attractiveness ratings of female faces by gender and condition.



In sum, though there were a number of significant effects, critically, mortality salience did not appear to reliably influence attractiveness ratings.

### **Artificiality**

I then shifted the focus of my analyses to the assessment of the impact of the mortality salience manipulation on the artificiality ratings of faces. First, I conducted a mixed model ANOVA with gender of participant (male or female) as a between subjects factor, condition (MS or pain) as a between subjects factor, and artificiality ratings at every morphing level of male/female faces as one within subjects factor, and another two-level within subjects factor of the gender of the target faces. The overall 4-way interaction was non-significant ( $p = .735$ ). Given the hypothesis that mortality salience should uniquely impact the artificiality assessments of female faces, I predicted that the interaction of condition by artificiality and gender of face should be significant within this model, since condition should predict artificiality assessments across the morphing spectrum, but only for female faces. This three-way interaction of condition by morphing increment by gender of target face was non-significant ( $p = .651$ ), indicating that the pattern of artificiality assessments across the morphing spectrum caused by condition was not significantly different when comparing female target faces and male target faces.

Despite this null result, I again conducted two mixed model analyses of variance (ANOVAs) with gender of participant (male or female) as a between subjects factor, condition (MS or pain) as a between subjects factor, but with artificiality ratings at every morphing level of male/female faces as within subjects factors. Again, I conducted a separate ANOVA for ratings of female and male faces. For artificiality ratings, there was a significant effect of morphing level on both male faces ( $F(10, 1690) = 986.937, p < .001$ ; see Figure 7) and female faces ( $F(10, 1690) = 774.609, p < .001$ ; see Figure 8), such that as faces became more heavily morphed,

people assessed them as more artificial. There was no significant effect of condition on artificiality assessments on male faces ( $p = .179$ ), while there was a significant interaction between MS and morphing level for artificiality assessments of female faces:  $F(10, 1690) = 2.628, p = .004$  (see Figure 9).

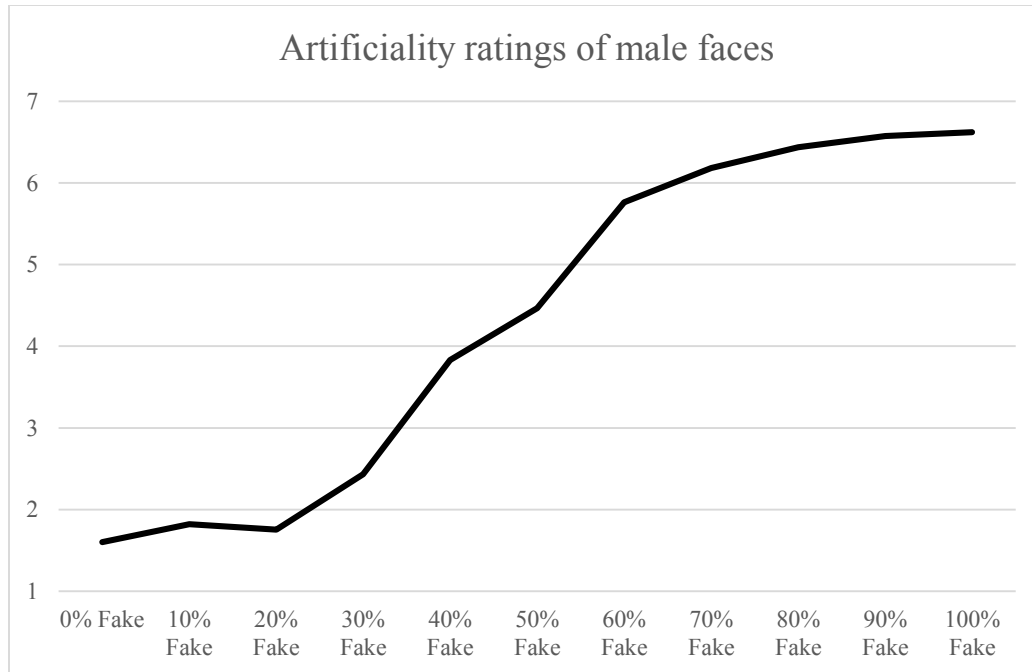


Figure 7. Artificiality ratings of male faces across the morphing spectrum.

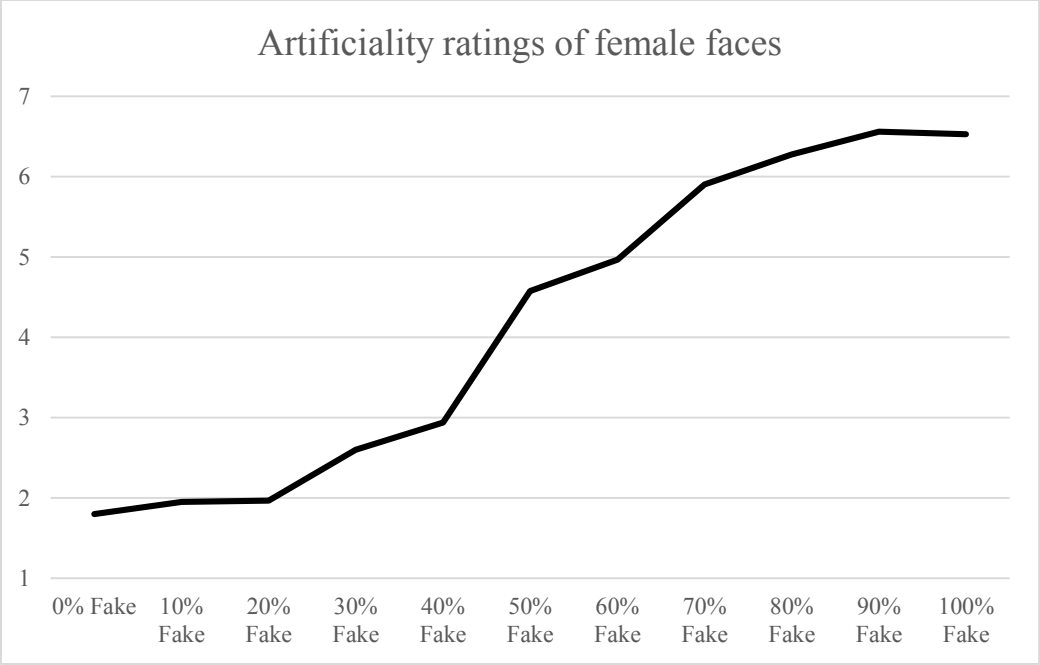


Figure 8. Artificiality ratings of female faces across the morphing spectrum.

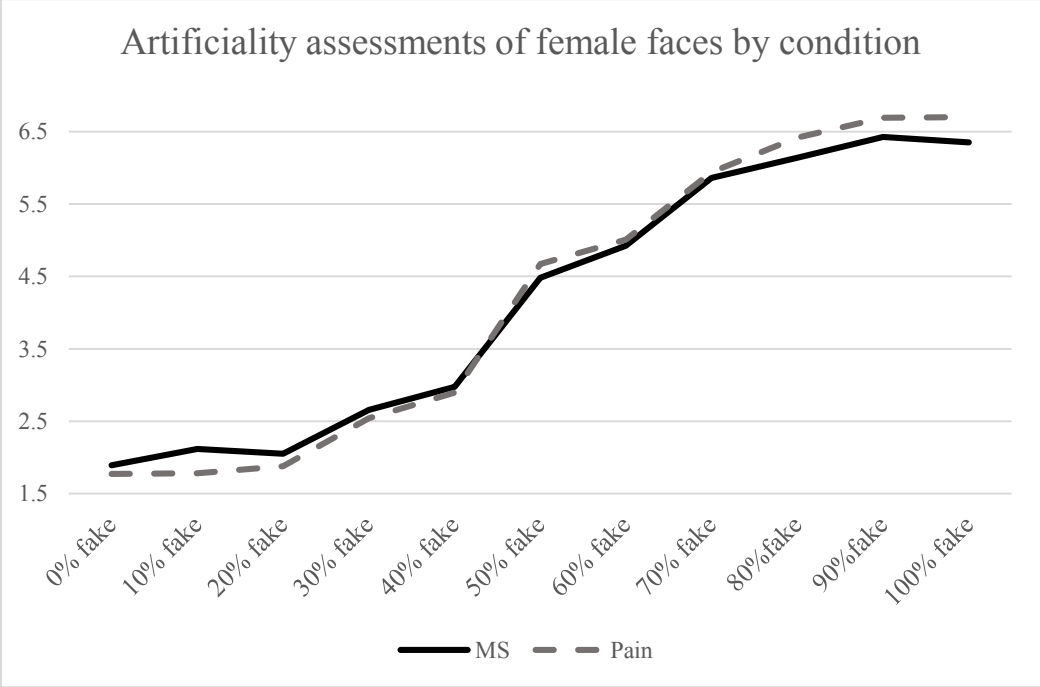


Figure 9. Artificiality ratings of female faces by condition.

To probe this significant interaction, I followed up with a series of pairwise tests to assess where along the morphing spectrum scores significantly differed by experimental condition. In a series of ANOVAs, artificiality assessments significantly differed by condition on 10% artificial female faces,  $F(1, 171) = 3.963, p = .048$ ; 90% artificial female faces,  $F(1, 171) = 4.226, p = .041$ ; and 100% artificial female faces  $F(1, 171) = 5.897, p = .017$ ; artificiality assessments were marginally different by condition on 80% artificial female faces,  $F(1, 171) = 2.950, p = .088$ . None of the other tests approached significance ( $p \geq .225$ ; means presented in Table 2). Artificiality assessments at the very artificial end of the spectrum (i.e. 80%, 90% and 100%) all trended in the same direction, such that individuals who were exposed to the MS manipulation rated these very artificial female faces as appearing less artificial than those who had been exposed to the control (pain) condition. The only other significant effect was at the low end of the artificiality spectrum (10%) and indicated that individuals exposed to MS rated non-artificial faces as more artificial than participants in the control condition, but this was isolated to the 10% artificial female faces.

Despite the null results of the three-way ANOVA of condition by morphing increment by gender of target face, separate ANOVAs of male and female target faces indicate that there is a significant effect of condition on female faces, while there is a non-significant effect on male faces. This indicates that perhaps mortality salience does have a similar effect on artificiality assessments of male faces as on female faces, but given the significance of the ANOVA when considering female faces, and the non-significance when considering male faces, the effect of MS on female faces is stronger. Despite a non-significant difference between male and female target faces, the impact of MS appears to be more powerful when individuals are looking at and assessing female faces.

No significant three-way interactions emerged with gender of participants, condition and morphing level on male faces ( $p = .998$ ) or female faces ( $p = .591$ ). In other words, the gender of the participant did not moderate the effect of condition on artificiality ratings. This null finding supports the TMT-derived hypothesis that individuals, regardless of gender, will rate female faces that are very artificial as being more real after exposure to a death reminder.

Table 2. Means and standard deviations for artificiality assessments of female faces at 11 morphing levels between conditions.

	Mean	SD
Artificiality of female faces: 0% artificial		
Death	1.894	1.157
Pain	1.704	0.877
Artificiality of female faces: 10% artificial		
Death	2.118	1.226
Pain	1.782	0.977
Artificiality of female faces: 20% artificial		
Death	2.052	1.197
Pain	1.878	0.978
Artificiality of female faces: 30% artificial		
Death	2.655	1.303
Pain	2.541	1.180
Artificiality of female faces: 40% artificial		
Death	2.977	1.306
Pain	2.895	1.118
Artificiality of female faces: 50% artificial		
Death	4.480	1.284
Pain	4.672	1.102
Artificiality of female faces: 60% artificial		
Death	4.922	1.092
Pain	5.006	1.087
Artificiality of female faces: 70% artificial		
Death	5.862	1.067
Pain	5.942	0.977
Artificiality of female faces: 80% artificial		
Death	6.138	1.243
Pain	6.419	0.872
Artificiality of female faces: 90% artificial		
Death	6.428	1.082
Pain	6.692	0.497
Artificiality of female faces: 100% artificial		
Death	6.353	1.167
Pain	6.701	0.644

Differences with  $p < .05$  demarcated in gray.

Overall, the effect of MS on artificiality assessments of female faces supports the hypothesis derived from TMT that death reminders serve to increase the likelihood that individuals will assess artificial female faces as appearing more real. As can be seen in Figure 9, in general, the more artificial the female face was, the more participants assessed it as being artificial. However, mortality salience dampened this tendency at high levels of artificiality. Being prompted with a death reminder appeared to make participants less inclined to perceive artificial female faces as artificial.

There was a significant effect of gender on artificiality assessments of male faces ( $F(10, 1690) = 4.879, p < .001$ ; see Figure 10), as well as on artificiality assessments of female faces ( $F(10, 1690) = 2.350, p = .009$ ), see Figure 11). Both of these effects suggest that male participants, as opposed to female participants, are more likely to rate very real faces as being more artificial than female counterparts. That is to say that male participants tended to assess barely morphed faces as being more artificial than female participants, in a sense assessing these faces less “accurately” (means presented in Tables 3 and 4).

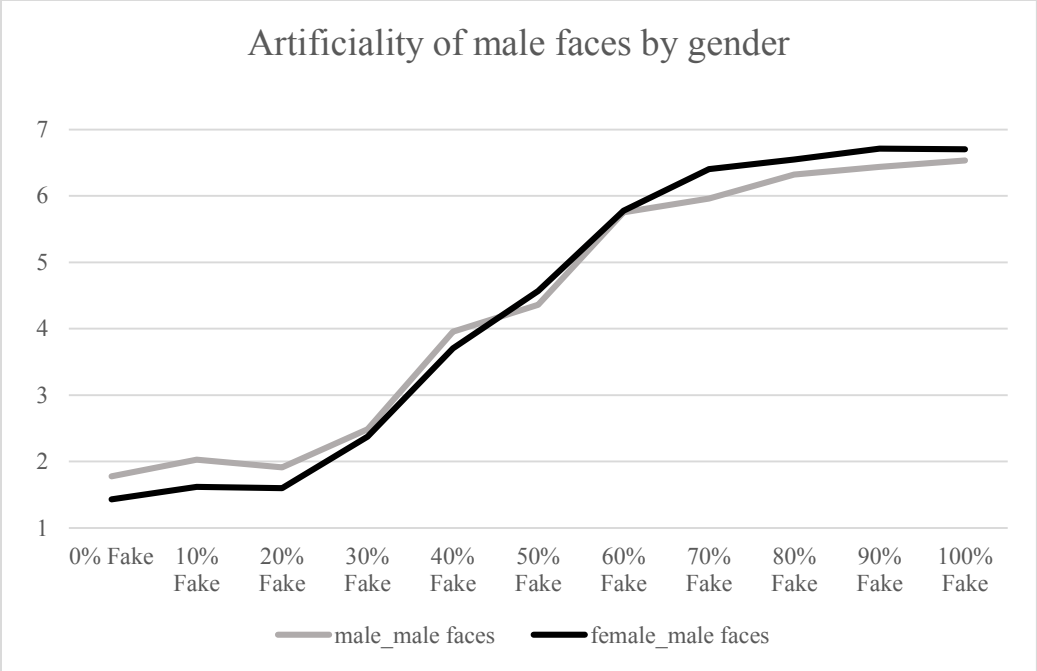


Figure 10. Artificiality of male faces by gender.

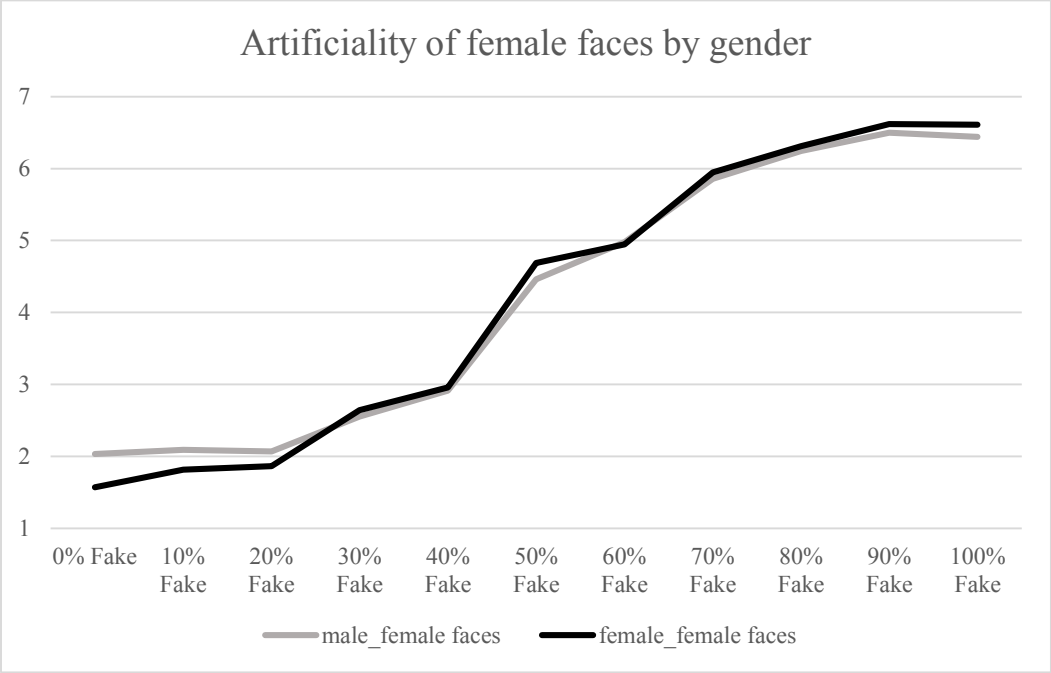


Figure 11. Artificiality of female faces by gender.



Table 3. Means and standard deviations for artificiality assessments of male faces at 11 morphing levels by gender.

	Mean	SD
Artificiality of male faces: 0% artificial		
Male	1.776	1.111
Female	1.428	0.603
Artificiality of male faces: 10% artificial		
Male	2.026	1.166
Female	1.618	0.785
Artificiality of male faces: 20% artificial		
Male	1.910	1.132
Female	1.598	0.688
Artificiality of male faces: 30% artificial		
Male	2.486	0.963
Female	2.376	0.750
Artificiality of male faces: 40% artificial		
Male	3.956	1.158
Female	3.704	1.114
Artificiality of male faces: 50% artificial		
Male	4.361	1.100
Female	4.569	1.024
Artificiality of male faces: 60% artificial		
Male	5.753	1.245
Female	5.776	0.900
Artificiality of male faces: 70% artificial		
Male	5.959	1.154
Female	6.402	0.926
Artificiality of male faces: 80% artificial		
Male	6.320	0.967
Female	6.549	0.800
Artificiality of male faces: 90% artificial		
Male	6.436	1.095
Female	6.710	0.744
Artificiality of male faces: 100% artificial		
Male	6.535	0.902
Female	6.704	0.750

Differences with  $p < .05$  demarcated in gray.

Table 4. Means and standard deviations for artificiality assessments of female faces at 11 morphing levels by gender.

	Mean	SD
Artificiality of female faces: 0% artificial		
Male	2.032	1.208
Female	1.569	0.754
Artificiality of female faces: 10% artificial		
Male	2.090	1.294
Female	1.813	0.901
Artificiality of female faces: 20% artificial		
Male	2.070	1.239
Female	1.862	0.924
Artificiality of female faces: 30% artificial		
Male	2.552	1.325
Female	2.644	1.157
Artificiality of female faces: 40% artificial		
Male	2.916	1.170
Female	2.957	1.260
Artificiality of female faces: 50% artificial		
Male	4.462	1.165
Female	4.687	1.224
Artificiality of female faces: 60% artificial		
Male	4.980	1.044
Female	4.948	1.134
Artificiality of female faces: 70% artificial		
Male	5.858	0.978
Female	5.945	1.065
Artificiality of female faces: 80% artificial		
Male	6.244	1.093
Female	6.310	1.074
Artificiality of female faces: 90% artificial		
Male	6.497	0.919
Female	6.621	0.779
Artificiality of female faces: 100% artificial		
Male	6.439	1.02966
Female	6.612	0.87750

Differences with  $p < .05$  demarcated in gray.

## GENERAL DISCUSSION

The aim of this study was to investigate whether terror management processes impact the perception of women's faces. Specifically, since concerns about creatureliness and mortality impact the treatment and objectification of women, the present study sought to address whether the same existential motivations will alter the way people perceive women's faces. The results provide preliminary evidence that death-awareness makes people more likely to see an image of a woman that has been altered to resemble an object (i.e. a doll), as resembling a real woman as opposed to those presented with a control condition. The experience of objectification leads women to be stripped of their identity as living, mortal beings, and heightened death-awareness takes this process a step further, leading people to perceive a non-live, plasticized caricature of a woman as being closer to the real thing. In a culture of objectification, rooted in existential anxiety, not only are women viewed as and treated as objects, objects are conversely viewed as women. Women are so frequently treated as sexual objects that the line between a real person, and a completely non-living object (in this case a Barbie doll) appears to become less concrete, and this impacts the perceptual processing of women's faces.

The present results found no impact of MS on the attractiveness assessments of female faces. The lack of significant findings on attractiveness could be due to a variety of factors. Where artificiality and animacy assessment is a more basic, cognitive/perceptual process, attraction is a multi-faceted phenomenon, and individuals vary widely in how they value and interpret cues for attraction. Additionally, the faces presented in the study lacked many factors that people may find attractive (e.g. hair, clothing), which may have impacted how people were assessing the attractiveness of the faces. Future research should address how MS may impact the more complicated process of attractiveness assessments of female and male faces.

## **Women in media**

The experience of objectification is one in which a woman ceases to be viewed as an autonomous living human, and is instead viewed purely in terms of objective, physical and sexual value. The standards of physical perfection that objectification places on women, often leads them to perceive their attractiveness as their only merit. Media constantly inundates us with images of women who have been morphed to the point of being unrecognizable—photo-shopping and airbrushing in media essentially turns real people into computer-generated objects that only resemble the real subject. The underlying sentiment seems to be that women are not acceptable in natural form. Instead, images of women are sanitized to appear less real—and in a quite literal sense, become an object, whose only value is its attractiveness and potential to be sexualized. Thus far, psychological research has not established whether the motivation to present highly air-brushed images of women in the media is at all existential in nature. The current results provide preliminary evidence that making death salient alters the way people perceive highly unreal images of women. Research has demonstrated that overt objectification of women is partially rooted in existential concerns—the present research indicates that this existentially-motivated objectification process may seep into the more subtle perceptual processes that we use to assess women and their faces.

### **The consequences of objectification**

A substantial body of research has demonstrated that women are more frequently objectified in their day-to-day lives, and more often sexualized in media (Bartky, 1990; Calogero, Tantleff-Dunn & Thompson, 2011; Gardner, 1980; Reichart & Carpenter, 2004). Media portrayals in particular have the potential to impact the beliefs people have regarding girls and women and their status as sexual objects. For example, exposing adolescent children to

sexualized media increases notions that women are sexual objects (Peter & Valkenburg, 2007). In this way, sexual objectification can strip women of autonomy and control over their bodies—instead, their bodies are converted into a commodity for the use by, and pleasure of others.

This phenomenon impacts the way people view women in general, as well as the way women view themselves. As stated earlier, self-objectification occurs when women internalize the view that they are nothing more than a sexual object (Calogero et al., 2011). This process places the burden on a woman constantly to monitor her appearance, and ensure that she is adequately attaining the standards of beauty that are placed on her by hypothetical observers. Since glorification of an unattainable ideal of “sexiness” and perfection abound in images of women, women and girls are constantly and acutely aware of their so-called shortcomings. Since objectification is motivated at least in part by existential factors, and since visual media constantly presents women in objectified form, the present study goes a step further, and establishes that existential influences may, in part, account for the portrayal of women in media.

### **Implications for intervention**

Beyond the current study, future research could further establish ways to counteract the pernicious effect of objectification on women. Psychologists have already begun to establish potential ways to intervene and disrupt the path from objectification to poor mental health outcomes in women (e.g. encouraging embodiment, managing objectifying triggers, emphasizing internal attributes; Tylka & Augustus-Horvath, 2011). Much remains to be done though in identifying how and why objectification occurs. If mortality fears, in part, explain the abundance of unrealistic images of women and the impossible standards they place on real women, then interventions focusing on existential-based therapies may be useful. If women are able to identify alternate, existentially meaningful pursuits outside of their value as sexual objects, focusing on

these pursuits may help them shift attention away from the objectifying experience. Research within the TMT framework has established that there are ways for people to constructively manage mortality concerns. For example, although mortality concerns can inhibit women from engaging in healthy behaviors (Goldenberg et al., 2008), when a health behavior is framed as an empowering activity, the opposite is true (Cooper, Goldenberg & Arndt, 2011). This indicates that when women are encouraged to see healthy behavior as empowering, MS can actually drive women to be healthier. Perhaps by extension, when a woman is experiencing objectification, trying to re-direct her perspective to how she is in control of her health and body can disrupt the path from objectification to poor mental health.

Some initiatives to promote realistic perceptions of beauty among women have already been developed. The “Dove Campaign for Real Beauty” and the “Dove Campaign for Self-Esteem” (Dove) are initiatives aimed at improving the average woman’s health and self-concept. These campaigns seek to emphasize to women that their self-esteem should not hinge on adhering to strict norms for perfection. These campaigns have launched popular advertisements featuring women of various body types, and emphasize that there are no strict requirements women must meet to feel confident in their bodies. Such campaigns are a promising avenue for promoting self-acceptance among women, and counteracting objectification. In the face of a society that constantly pressures women to feel negatively about their bodies, and to see themselves solely as objects for others, encouraging self-esteem independent of appearance-related pursuits could go far in terms of circumventing the negative effects objectification frequently has on women.

Overall, the present study adds to the terror management and objectification literatures by demonstrating that the same processes that motivate objectification motivate differential

perceptual processing of women. These findings may, in part, begin to explain why media images of women are excessively altered to the point of looking artificial. Future research could further investigate ways to circumvent the negative effects objectified and sexualized imagery have on women, and ultimately aid in the development of initiatives aimed at the counteraction of objectification.

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## **APPENDIX A. MORTALITY SALIENCE CONDITION**

### **The Projected Life Attitudes Assessment**

This assessment is a recently developed, innovative personality assessment. Recent research suggests that feelings and attitudes about significant aspects of life tell us a considerable amount about the individual's personality. Your responses to this survey will be content-analyzed in order to assess certain dimensions of your personality. Your honest responses to the following questions will be appreciated.

1. PLEASE BRIEFLY DESCRIBE THE EMOTIONS THAT THE THOUGHT OF YOUR OWN DEATH AROUSES IN YOU.
2. JOT DOWN, AS SPECIFICALLY AS YOU CAN, WHAT YOU THINK WILL HAPPEN TO YOU AS YOU PHYSICALLY DIE AND ONCE YOU ARE PHYSICALLY DEAD.

## **APPENDIX B. PAIN SALIENCE CONDITION**

### **The Projected Life Attitudes Assessment**

This assessment is a recently developed, innovative personality assessment. Recent research suggests that feelings and attitudes about significant aspects of life tell us a considerable amount about the individual's personality. Your responses to this survey will be content-analyzed in order to assess certain dimensions of your personality. Your honest responses to the following questions will be appreciated.

1. PLEASE BRIEFLY DESCRIBE THE EMOTIONS THAT THE THOUGHT OF BEING IN INTENSE PHYSICAL PAIN AROUSES IN YOU.
2. JOT DOWN, AS SPECIFICALLY AS YOU CAN, WHAT YOU THINK WILL HAPPEN TO YOU PHYSICALLY AS YOU ARE IN INTENSE PAIN.



### APPENDIX C. PANAS

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way right now. Use the following scale to record your answers:

1	2	3	4	5
very slightly or not at all	a little	moderately	Quite a bit	extremely

1. Interested	11. Guilty
2. Irritable	12. Determined
3. Distressed	13. Scared
4. Alert	14. Scared
5. Excited	15. Hostile
6. Ashamed	16. Jittery
7. Upset	17. Enthusiastic
8. Inspired	18. Active
9. Strong	19. Proud
10. Nervous	20. Afraid

## APPENDIX D. ARTIFICIALITY AND ATTRACTIVENESS RATINGS

You will now view some pictures of people's faces, and answer some questions about each of them. The faces will appear only briefly, but just answer the questions with your most immediate, gut-level response.

1. How fake or artificial did this face appear to you?

1	2	3	4	5	6	7
not at all artificial						definitely artificial

2. How physically attractive did you find this face?

1	2	3	4	5	6	7
very unattractive						very attractive