The Psychological Functions of Cultural Legacy: A Terror Management Investigation of Creative Achievement and Symbols of Motherhood

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Abstract

This thesis examined if, and by which avenues, can cultural legacy can help to manage existential concerns. The existential anxiety buffering functions of creative achievement and of symbols of motherhood were examined utilizing a Terror Management Theory (TMT) paradigm. The relationship between death awareness and creativity was supported by the findings of a TMT literature review and of a mini meta-analysis. In a study of the existential anxiety buffering functions of creative achievement, it was found that when death awareness was high, high levels of creative achievement were associated with reduced thoughts of death in comparison to a control condition. This was the case only among persons with high levels of creative goals. Also, the existential anxiety buffering functions of symbols of motherhood (and boundary conditions of the symbolic properties of realistic representations of motherhood) were examined in three studies. It was found that exposure to symbols of motherhood can serve anxiety buffering functions when death is salient, but only when they do not exhibit the physicality of the female body in relationship to motherhood. Specifically, after death reminders, exposure to symbols of motherhood that do not expose the physicality of the female body increased implicit self-esteem levels. In contrast, exposure to women's portrayals that highlight the physicality of the female body after death reminders led to increased feelings of disgust. Overall, current evidence supports the notion that cultural legacy pursuit is one psychological motivation that affects people's attitudes and behaviours, particularly when mortality awareness is high. These findings have implications for creativity promotion and the use of symbols of motherhood to improve women's physical and psychological wellbeing. Future directions for research on motherhood, terror management motivations, and their impact on everyday life are presented.

Declaration

The research presented in this thesis was conducted at the School of Psychology, University of Kent, whilst the author was a full-time postgraduate student. The theoretical and empirical work presented is original work completed by the author under the supervision of Dr Arnaud Wisman and the experiments were conducted with limited assistance from others. The author has not been awarded a degree by this, or any other University for the work included in this thesis.

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Perach, R. & Wisman, A. (2015). Can creativity beat death? The relationship between creative achievement and death-thought accessibility. Poster presented at the 5th Annual Kent Postgraduate Festival, Canterbury, UK.

Perach, R. & Wisman, A. (2015). Can creativity beat death? The relationship between creative achievement and death-thought accessibility. Poster presented at the 4th South East Doctoral Training Centre Annual Conference, Canterbury, UK.

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Chapter 1

Introduction

"The hope and belief is that the things that man creates in society are of lasting worth and meaning, that they outlive or outshine death and decay, that man and his products count."

"As one's whole life is a style or a scenario with which one tries to deny oblivion and to extend oneself beyond death in symbolic ways, one is often untouched by the fact of his [her] death because [s]he has been able to surround it by larger meanings."

E. Becker (1973)

1.1. Overview

People pursue many aims daily, from looking for a romantic partner or caring for family members to finding employment. Such pursuits, while surely valuable on their own, can be understood as manifestation of other, basic needs that stem at the core of human existence (Yalom, 1980). These include the desire for meaning in life, self-determination and structure, social membership and connectedness, and the desire to continue to exist despite the awareness that one will eventually die. Different theories in psychology draw each on these existential motivations in an attempt to understand human beliefs and behaviours (Deci & Ryan, 2000; Heine, Proulx, & Vohs, 2006; Kay, Whitson, Gaucher, & Galinsky, 2009; Kirkpatrick & Navarrete, 2006; van den Bos, 2009). This thesis focuses on the awareness of death as fundamental to human motivation (Greenberg, Pyszczynski, & Solomon, 1986).

The desire to transcend death has been recognized as early as the days of the ancient Greek culture. In Plato's symposium (2009), seer Diotima states that men's greatest motivation is "To win eternal mention in the deathless roll of fame" (p.43). Culture provides humans with a repertoire of symbols and worldviews, through which they can approach the resolution of various problems (Swidler, 1986). Considering the centrality and persistence of the problem of death, it is reasonable to look for cultural prescriptions against it. One way to (non-literally) escape death is to stay alive in people's minds and culture even after one's physical death. Vincent van Gogh, Sigmund Freud, and Elvis Presley are all in that sense very much alive, as founding members of different domains in our culture. Another way to extend beyond one's temporary existence is to invest in a long-lasting system of symbols and meanings that has preceded and will outlive one's physical existence. For example, religion provides a cross-cultural belief in immortality (Lehmann & Myers, 1993) that serves to reduce the anxiety experienced by death awareness (Marett, 1914). Other examples include money (Zelizer, 1989) and kinship. In other words, one way to defeat death, or more precisely, to use symbolic means in order to defeat the awareness of death, may be the production or validation of cultural legacy. The main research question of this thesis is if, and by which avenues, can cultural legacy help to overcome the existential problem of death awareness. Specifically, this thesis focuses on the anxiety buffering functions of creative achievement as an avenue for cultural legacy production and on symbols of motherhood as an avenue for cultural legacy validation in the face of death.

1.2. Terror Management Theory

Terror management theory (TMT; Greenberg et al., 1986) is a highly influential theory in the field of social psychology that emerged in the late 1980s. The theory is largely based on the

works of cultural anthropologist Ernest Becker (1971, 1973) and psychoanalyst Otto Rank (1941) and is compatible with the ideas of various existential thinkers such as Søren Kierkegaard, Friedrich Nietzsche, and Karl Jaspers. At the heart of TMT is the assumption that the awareness of death serves as a fundamental motivator of human behaviour. According to TMT, humans have unique cognitive capacities such as abstract, symbolic thinking and self-awareness that serve to increase their environmental adaptability and continued existence. However, with the knowledge of one's self, comes the understanding that one will inevitably die. Thus, while human beings, like other organisms, are driven by a desire to survive, they are unique in their cognitive capacity to understand their mortal nature. This conflict between mortality awareness and survival goals creates an existential paradox, which may lead to experiencing severe, paralyzing anxiety, or *terror*.

In order to defend oneself from the terror of death awareness, people invest in two interrelated psychological structures. The first is cultural worldviews: a set of socially constructed and validated beliefs that provide meaning, order, a set of principles to live by, and the promise of either literal (i.e., after-life) or symbolic immortality to those who adhere to cultural prescriptions. While these internalized beliefs are individually determined and differ across persons, their validation offers death transcendence via lasting cultural membership to all people who are faced with their mortality. The second death-anxiety buffering structure is self-esteem. Self-esteem is maintained by perceiving one's self as a socially valued individual, that is, as someone who possesses attributes that are culturally-valued (i.e., lives up to one's cultural worldviews) or fulfils important social roles. As a valuable contributor to a meaningful, long-lasting culture that will outlive one's physical existence, one gains the protection from mortality concerns offered by one's culture. In other

words, defence from mortality awareness may be achieved via validating a cultural worldview and adhering to the values it prescribes. The tenets of TMT have gained empirical support from over hundreds of experiments across the world (Greenberg, 2012; Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004).

The psychological process of defending against one's mortality awareness is posited to occur in two main stages (Pyszczynski, Greenberg, & Solomon, 1999). As the first, immediate step of dealing with the terror of death, people engage in *proximal defences*. These are rational attempts to remove the threat from one's focal attention either by distracting one's self from it (thereby ignoring the threat) or by denying one's vulnerability to the threat (thereby removing its threatening aspects). The second set of defences are *distal defences*. These defences operate when thoughts of death become unconscious by employing symbolic conceptions of self and culture that serve to secure one's sense of immortality. In other words, distal defences manage the threat of death awareness outside conscious awareness by enabling the self-perception that one is a valuable contributor to a meaningful, enduring world. Importantly, according to TMT, securing one's sense of immortality is posited to occur only once proximal defences have subsided. Because proximal defences involve the suppression of conscious death thoughts, death thoughts re-surface on a nonconscious level only after a delay or distraction, leading to the activation of distal defences that serves to buffer against the threat of death awareness (Pyszczynski et al., 1999). This activation may be moderated by individual differences in personality traits and worldviews (Landau, Sullivan, & King, 2010). This process of psychological defence against mortality awareness is presented in Figure 1.

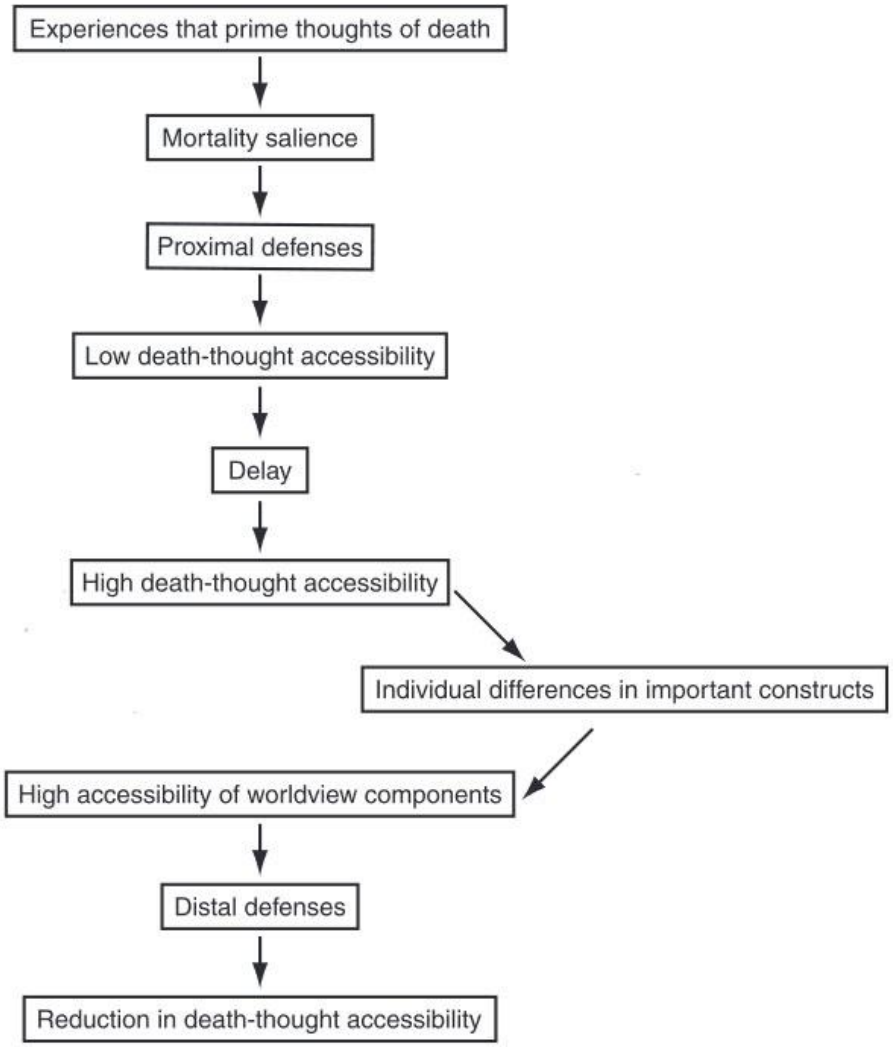

Figure 1. The process of psychological defence against death awareness. An abbreviated model adapted from Arndt, Cook, & Routledge, 2004.

1.3. TMT Hypotheses and Paradigm

TMT research is driven by several hypotheses. The first is the *Mortality Salience* (MS) *hypothesis* (Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989) which states that if cultural worldviews and self-esteem can serve to buffer mortality concerns, then making mortality salient should increase individuals' need for this symbolic protection. Consequently, this should motivate people to uphold, defend, and validate their worldviews,

and seek to enhance their self-esteem. The second is the *anxiety-buffer hypothesis* (Harmon-Jones et al., 1997), which posits that if a psychological construct provides protection from death-related anxiety, then strengthening that construct should make one less likely to exhibit anxiety or anxiety-related behaviour and will attenuate the need for other psychological defences after being reminded of one's mortality. A third hypothesis is the *death thought accessibility hypothesis* (Pyszczynski et al., 1999), which states that if a psychological construct (e.g., a cultural worldview) serves as a buffer from thoughts about death, then weakening this construct would bring death-related thoughts closer to consciousness thus increasing their accessibility while strengthening this construct would reduce nonconscious thoughts about death. These three hypotheses have received wide empirical support (see Burke, Martens, & Faucher, 2010; Greenberg, 2012; Hayes, Schimel, Faucher, & Williams, 2008; Pyszczynski et al., 2004). Finally, the *existential escape hypothesis* (Wisman, Heflick, & Goldenberg, 2015) posits that reminders of mortality motivate people with low levels of self-esteem to escape self-awareness as a form of a distal defence that does not require the 'use' of the self and its symbolic capacities (Wisman, 2006).

Studies on the awareness of death have been conducted in lab, online, and field settings. In the former two, mortality awareness is typically manipulated by asking participants to complete two questions designed to elicit thoughts on death: "Briefly describe the emotions that the thought of your own death arouses in you.", and "Jot down, as specifically as you can, what you think will happen to you physically as you die and once you are physically dead." (Rosenblatt et al., 1989). Another questionnaire manipulation involves completing a series of death-related true/false statements (e.g., "I am very much

afraid to die") (Cox et al., 2009). In the control condition, these measures are adjusted to elicit various neutral (e.g., watching television, reading books) and adverse (e.g., extreme pain, dentist visit, public speaking) experiences by replacing death-related phrasings with their control parallels (see Burke et al., 2010). The activation of worldview defence and self-esteem as existential defence mechanism that operate on a distal level has been shown using varied outcome measures including self-reported (e.g., picture rating), and behavioural (e.g., creative behaviours) measures.

1.3.1. Individual Differences in Terror Management

According to TMT, while all people share the motivation to defend against the awareness of death, there are individual differences in people's need to do so (Landau & Sullivan, 2015). When mortality is salient, some personality traits may predispose people to engage in distal defences while other traits may serve to buffer the threat of death awareness and reduce the need to engage in these defences. In other words, individual personality differences may contribute to one's existential vulnerability or resilience. The scope of personality traits that have been found to moderate MS effects is vast, including attachment styles (Mikulincer, Florian, & Hirschberger, 2003; Taubman-Ben-Ari, Findler, & Mikulincer, 2002), openness to experience (Boyd, Morris, & Goldenberg, 2017), trait mindfulness (Niemiec et al., 2010), humility (Kesebir, 2014), self-consciousness (Taubman–Ben-Ari & Noy, 2010), interdependent self-construal (Juhl & Routledge, 2015; Routledge, Juhl, Vess, Cathey, & Liao, 2013), personal need for structure (Landau et al., 2004; Vess, Routledge, Landau, & Arndt, 2009), nostalgia proneness (Juhl, Routledge, Arndt, Sedikides, & Wildschut, 2010; Routledge, Arndt, Sedikides, & Wildschut, 2008), and self-control ability (Gailliot,

Schmeichel, & Baumeister, 2006). The following section focuses on individual differences in the two key existential defence mechanisms, namely, self-esteem and cultural worldviews.

According to TMT, self-esteem is key to the management of existential concerns (Greenberg et al., 1986). Indeed, people with high, but not low, levels of self-esteem have a sense of valued membership in (a lasting) culture and therefore a strong symbolic existential defence mechanism. Also, because people with high levels of self-esteem have stronger defence structures that relate to cultural value and contribute to buffering thoughts on death, they are likely to 'use' such symbolic structures (i.e., activate self-related structures including cultural worldviews) to manage death awareness (Wisman et al., 2015). Indeed, evidence from numerous studies supports the increased resilience (Arndt & Greenberg, 1999; Greenberg et al., 1992; Harmon-Jones et al., 1997; Lifshin, Greenberg, Zestcott, & Sullivan, 2017; Schmeichel et al., 2009) and use of symbolic capacities (see Wisman et al., 2015) among people with high levels of self-esteem following reminders of death. For example, it has been found that after MS, high levels of trait or manipulated implicit self-esteem have been associated with decreased worldview defence (Schmeichel et al., 2009). Others have found that MS increased (self-enhancing) risky decision making in people with high levels of self-esteem (Landau & Greenberg, 2006).

A complementary assertion that follows from TMT's tenets is that people with low levels of self-esteem do not have a strong notion of themselves as valued cultural members and thus have a weak existential defence mechanism (Greenberg et al., 1986). Indeed, a body of evidence supports the increased vulnerability of people with low levels of self-esteem to death reminders (Abeyta, Juhl, & Routledge, 2014; Routledge et al., 2010; Wisman & Heflick, 2016). For example, it has been found that among people with low, but

not high, levels of self-esteem, MS decreased personal hope (Wisman & Heflick, 2016). Also, because people with low levels of self-esteem experience a negative discrepancy between their ideal and actual self when made self-aware, they are less likely to use self-related structures to defend against death awareness (Wisman et al., 2015). For example, it has been found that MS increased (self-awareness escaping) drinking behaviours in a nightclub among people with low, but not high, levels of self-esteem (Wisman et al., 2015).

Because people differ in their sources of self-esteem, validating a particular domain of self-esteem may serve existential anxiety buffering functions only among people who derive self-esteem from it (Pyszczynski et al., 2004). For example, it has been found that MS increased risky driving (self-reported and on a driving simulator), but only among participants who considered their driving ability to be relevant to their self-esteem (Ben-Ari, Florian, & Mikulincer, 1999). Others have found that MS increased performance of a physical strength task among persons who were invested in strength training (i.e., lifting weights) (Peters, Greenberg, Williams, & Schneider, 2005). Thus, people who stake their self-esteem on particular domains can use these domains to buffer against death awareness. The same applies to the validation of specific cultural worldviews, which may serve existential functions only among those who subscribe to them. For example, it has been found that after MS, participants who scored high, but not low, on affective empathy (i.e., had empathy as cultural worldview) showed more compassion towards an outgroup social transgressor (Schimel, Wohl, & Williams, 2006). This is consistent with evidence on the association between people's cultural background (i.e., having particular cultural worldviews) and affective empathy levels in response to social pain (Atkins, Uskul, &

Cooper, 2016). Overall, in line with TMT, evidence shows that individual differences in self-esteem and cultural worldviews moderate the management of existential threat.

1.4. How to Become (Symbolically) Immortal

A sense of immortality has been referred to as representing one's desire to maintain "an inner sense of continuous symbolic relationship, over time and space, with the various elements of life" (Lifton, 1973, p.5). From a TMT perspective, symbolic immortality can be achieved via multiple avenues that involve the validation of one's cultural worldviews. These include perceiving oneself as belonging to a long-lasting culture, producing a great work of art or science, having children, and accumulating great wealth (Solomon, Greenberg, & Pyszczynski, 2004). What all these have in common is the production or validation of a cultural legacy, that is, the notion that one's existence is continued beyond mortality via being a part of a long-lasting culture.

The difference in the existential foundations of the production and validation of cultural legacy may be understood in terms of the "twin ontological motives" (Becker, 1973): human's desire for exploring and realizing their personal potential, and thus feeling that one's existence contributes to a meaningful world and the alternate motivation for security, comfort, and a feeling of connectedness which provides existential protection (Rank, 1998\1932). The production of cultural legacy may function to satisfy the need for personal fulfilment and meaning, while the validation of cultural legacy the need for security and connectedness. This thesis focuses on the production of cultural legacy via creativity and its validation through cultural symbols of motherhood, as detailed next.

1.4.1. Cultural Legacy Production

Cultures commemorate their inventors, heroes, and leaders (Becker, 1973; Morris, 1997), so

that their legacy lives on after their death. This can be seen in monuments, memorials, and commemorative days through which collective memory is formed and communicated (Carrier, 2006). In sports culture, deceased football talents are memorialized by monuments and mythologized by favourable, selective media discourse (Russell, 2006). In chess, gifted players are idealized, and their commemoration is linked to the extent to which they serve to validate (nationalistic) cultural worldviews. For example, the myth of American chess grandmaster Bobby Fisher was enhanced by his triumph over Soviet rival Boris Spassky during the Cold War, but was damaged after his controversial remarks on the 9/11 attacks (Fine, 2013). Finally, museums grant continuous cultural existence to creators by displaying their culturally-valued work. In doing so, museums may serve to reinforce prevailing worldviews and meaning systems in face of humans' mortal nature, thus serving an existential function (O'Neill, 2012). If culture immortalizes its prominent figures by incorporating their cultural legacy into its collective memory, then becoming a highly valued member of culture holds the promise of symbolic immortality. Looked at differently, by securing the continued existence of one's reputation or achievements after death, one can become symbolically immortal. Thus, symbolic immortality may be gained by the production of a cultural legacy.

The relationship between the production of a cultural legacy and death awareness is supported by numerous TMT studies. The desire to work (Yaakobi, 2015) and thoughts on one's continued influence and reputation after death (Wojtkowiak & Rutjens, 2011) have both been found to have anxiety buffering functions in the face of death. After MS, an increased willingness to self-sacrifice for one's nation has been found, when an alternative route for symbolic death-transcendence was not provided (Routledge & Arndt, 2007). Others

have found that exposure to destroyed buildings increased dogmatic beliefs, support for military action, and death thought accessibility, suggesting that the destruction of man-made monuments can be existentially threatening and engender worldview defence (Vail, Arndt, Motyl, & Pyszczynski, 2012). Finally, it has been found that death awareness increased the desire to be famous and to have a star named after oneself (Greenberg, Kosloff, Solomon, Cohen, & Landau, 2010). This body of empirical evidence supports the notion that securing one's continued reputation or achievements beyond the grave via cultural legacy production can serve existential anxiety buffering functions.

One path for cultural legacy production is by generating useful, socially-acknowledged, original contributions in the fields of arts and science, that is, producing creative achievement. Exemplifying the connection between cultural legacy production and validation, eminent creative individuals can become a part of a culture's system of symbols. In the UK, for example, painter William Turner stands for creativity in the arts and Margaret Thatcher for uncompromising leadership ('The iron lady'). Thus, by producing cultural legacy, one can not only gain symbolic immortality but also come to represent culturally-valued attributes as a cultural symbol, whose validation is another form of cultural legacy.

1.4.2. Cultural Legacy Validation

Cultural symbols have been referred to as constructs of shared meanings that are created by a social group to manage its everyday routine and are passed on from generation to generation (Danesi & Perron, 1999). Some symbols are ancient and deeply embedded in people's cultural knowledge (e.g., water as a representation of life). Other cultural symbols correspond to contemporary themes and represent culturally-valued traits. For example, the symbol of recycling is associated with pro-environmentalism (Markle, 2014). The meanings

of a cultural symbol can change across generations to reflect dominant cultural worldviews. For example, symbols of sex reflect prevailing cultural perceptions of sexuality, from Marylin Monroe's "natural feminine" sexuality that was informed by the Kinsey report (Dyer, 1986) to the entrepreneurial sexiness of celebrities such as Teri Hatcher in contemporary neoliberal society (Evans & Riley, 2013). Furthermore, the meanings of cultural symbols can depend on the extent to which they reflect cultural worldviews. For example, money can be seen as sacred in some contexts (e.g., culturally-valued religious donations) and as profane in others (e.g., culturally-disapproved 'blood' money) (Belk & Wallendorf, 1990). Thus, cultural symbols can represent valued cultural traits and their meaning is shaped across time and life-contexts by prevailing cultural worldviews. In other words, cultural symbols can be seen as vehicles for the communication and maintenance of cultural worldviews and legacy.

If cultural symbols represent and convey cultural worldviews that can secure one's sense of immortality (Salzman, 2018), then the validation and re-affirmation of cultural symbols can be one way for people to manage the awareness of death (Greenberg et al., 1986). This notion has gained support from numerous TMT studies. For example, when death awareness is high, people invest in cultural symbols by defending Western culture (Norenzayan, Dar-Nimrod, Hansen, & Proulx, 2009), one's country (Greenberg et al., 1990), home town (Jonas & Fischer, 2006), and university (Dechesne, Janssen, & van Knippenberg, 2000). Others have found that after MS, people show increased preference for national cultural items (Jonas, Fritsche, & Greenberg, 2005) and place a greater value on money (Zaleskiewicz, Gasiorowska, Kesebir, Luszczynska, & Pyszczynski, 2013). Finally, it has been found that thinking about death increased people's reluctance to inappropriately use

cultural objects such as the American flag (Greenberg, Porteus, Simon, Pyszczynski, & Solomon, 1995). The above evidence supports the notion that valuing and validating a wide range of cultural symbols when death is at bay can serve to buffer the terror elicited by reminders of one's mortality. In other words, the validation of cultural legacy through cultural symbols can help people defend against the awareness of death.

Taken together, the evidence suggests that cultural legacy is a key path to symbolic immortality in the face of death, and that its production or validation is likely to have existential anxiety buffering properties. This thesis examines the anxiety buffering functions of cultural legacy production and validation via focusing on the anxiety buffering functions of creative achievement and of symbols of motherhood, respectively, when death is salient.

1.5. Leaving an Enduring Creative Legacy Behind

Creativity has been defined as "the interaction among *aptitude, process, and environment* by which an individual or group produces *a perceptible product* which is both *novel* and *useful* as defined within a *social context*" (Plucker, Beghetto, & Dow, 2004, p.90). Various scholars have linked creativity to the awareness of one's self in the present and its projection into the future. Creating art has been described as a powerful means for achieving "flow" (Csikszentmihalyi & Robinson, 1990), defined as one's full engagement in an intrinsically rewarding activity with one's complete attention on the present moment, accompanied by a loss of objective self-awareness (Csikszentmihalyi, 1990). Such creative engagement may be considered a path for individuation and unique self-expression through which the artist seeks to immortalize oneself (Rank, 1998\1932). According to Lifton (1973, 1979), creativity is one avenue for attaining symbolic immortality through the achievement of a long-lasting human impact via one's teaching, personal influence, or creative contribution to culture and

society. Others have suggested that humans may have an evolved, intrinsic motivation for leaving a phenotypic legacy behind through creative achievement (Aarssen, 2010).

The term *Big-C* (eminent) creativity refers to the generation of an extraordinary creative work that has left a significant impact on its field and has the potential to elevate its creator to legend status (Kaufman & Beghetto, 2009). For example, the long-lasting works of great opera composers such as Verdi (Simonton, 1998) or scientists such as Newton (Simonton, 1992). Big-C levels are reached only by a minority of individuals in a given population (Eysenck, 1995) and according to the Four C model of creativity (Kaufman & Beghetto, 2009) are preceded by earlier levels of non-eminent creative acts. These are captured under the term *little-c* (everyday) creativity, which denotes creative activities across various life domains in which the average person can participate daily (Kaufman & Beghetto, 2009; Richards, 2010).

The early stages of little-c involve creative interpretations that follow the acquisition of knowledge relating to creative acts and are marked by its independence of being original or meaningful to others (e.g., making first attempts at writing a humorous online "tweet"). After repeated attempts and tinkering, these creative activities may come to involve originality and social meaningfulness (e.g., writing a popular, impactful "tweet"). Professional expertise is reached through years of effortful and developmental progression (e.g., publishing a book based on insights from "tweets"). It has been found that approximately 10 years of practice are required to learn the mechanics of a given field, for example contemporary writing (Kaufman & Kaufman, 2007) or composition (Simonton, 2000). The transition from this level of creative expertise to eminence typically takes approximately 10 years more (Simonton 1997), depending on the innovation characteristics

of the domain (Kaufman & Kaufman, 2007). Thus, high levels of creative achievements are preceded by creative activities that differ in their levels of mastery, experience, and social relevance (Kaufman & Beghetto, 2009).

While eminent levels of creativity are not reached by many, virtually anyone can be creative in a range of activities (Richards, 2007). Creative achievement can thus be seen as a spectrum, ranging from minor, socially recognizable achievements (e.g., playing music in a local venue) to great works of art or science. However, it has been shown that personal characteristics such as intelligence, imagination, nonconformity, and intrinsic motivation as well as interpersonal characteristics such as familial support, expert interactions' opportunities, and a stable cultural climate can facilitate creative achievement in individuals (see Carson, Peterson, & Higgins, 2005). Thus, while nearly everyone shares the capacity for creative achievement, certain personality characteristics within a specific cultural context may predispose one towards it.

In the words of Becker (1977, p.171-2), "The work of art is, then, the ideal answer of the creative type to the problem of existence . . . [S]He wants to know how to earn immortality as a result of his [her] own unique gifts." Stated differently, the existential appeal of creative achievement may be particularly high among people who invest and engage in creativity. From a TMT perspective, this suggests that people who pursue creative goals (i.e., have creativity as a central cultural worldview) are most likely to reap the symbolic immortality benefits of creative achievement. In the second chapter of this thesis, I address the question of whether and for whom can creative achievement can serve anxiety buffering functions in face of death awareness.

1.6. Safety in Mothers

In today's culture, mothers are idealized as devoted, self-sacrificing, ever-loving, perfectly attuned to the child's needs, and nurturing figures (Thurer, 1994). This conception of motherhood originates in symbols of motherhood that have had key cultural significance for centuries (Thurer, 1994) and are embedded in contemporary cultural media narratives (Gotlib, 2016). TMT posits that when people become aware of their mortality cultural symbols can be a source of enduring meaning and their validation an avenue for symbolic immorality via long-lasting cultural membership (Greenberg et al., 1986). Hence, symbols of motherhood may serve anxiety buffering functions in the face of death. According to Kristeva (1987), mothers help mankind to surmount death via the elicitation of pre-verbal images of maternal love. Rich (1976) has theorized that the angelic, ever-loving characteristics assigned to mothers may serve to deny the anxiety aroused by the physicality of the mother's body. Finally, motherhood may provide an avenue for literal immortality. In Christianity, Mary serves as an absolute representation of motherhood and as an avenue for literal death transcendence (Warner, 1976). In the story of Jacob's ladder in the Old Testament, Mary is the ladder that connects heaven and earth, through which man can ascend to heaven (Warner, 1976).

The shared conceptions of motherhood shape and are reflected in various cultural scripts, ideologies, and policies (Douglas & Michaels, 2005; Rich, 1976; Thurer, 1994; Vandenberg-Daves, 2014; West, 2003). Symbols of motherhood are perhaps most culturally evident in the defining characteristics of contemporary motherhood ideologies. The term *Intensive Mothering* (Hays, 1996) refers the dominant motherhood ideology in Western culture since the 1980s. This ideology defines "good" childrearing as the exclusive domain

of a mother who is extremely dedicated and invested in caregiving, best able to meet the needs of the child, ever-loving and ever-affectionate, and finds in childrearing an ultimate satisfaction that could not be found in career pursuit (Hays, 1996). Others have similarly described dominant motherhood ideologies as dictating impossible, extremely demanding devotions from mothers (Douglas & Michaels, 2005). Intensive mothering beliefs have been correlated with negative mental health indicators among mothers such as lower life satisfaction, depression, and stress (Rizzo, Schiffrin, & Liss, 2013). Also, it has been found that mothers who fail to live up to symbolic motherhood ideals experience higher levels of guilt and shame (Liss, Schiffrin, & Rizzo, 2013). Additional adverse outcomes of motherhood ideals in mothers include anxiety, perceived incompetency, loneliness, and exhaustion (Douglas & Michaels, 2005; Lee, Vasileiou, & Barnett, 2017; Wall, 2010).

The cultural adherence to and reinforcement of symbols of motherhood has important implications to the lives and reproductive choices of women and for society at large. Women believe that their limited financial prospects are a reason against having children (Graham, Hill, Shelly, & Taket, 2013; Tanturri & Mencarini, 2008), which may negatively affect rates of reproductive behaviours. For example, in a national study of childless US women aged 15-44, 14% reported not wanting to have a baby in the future (Craig et al., 2014). Indeed, decreases in women's post-labour employment that persists over a 10-year span have been found in West-Germany, Spain, and Italy (Gutierrez-Domenech, 2005). Opting-out of motherhood may be most prominent among professional career women such as professional chefs (Harris & Giuffre, 2010) and high-ranking academics (Baker, 2010) who are required to make greater personal sacrifices to meet motherhood ideals (Badinter, 2011). On a wider scale, the implications of women's opting-out of motherhood include decreases in national

fertility, family size, and levels of social integration and support networks (Badinter, 2011; Tanturri et al., 2015).

Overall, it can be seen that symbols of motherhood are an inseparable part of contemporary culture and its ideologies. While the functions served by these symbols at times benefit governments and selected social groups (Gough & Noonan, 2013; Vandenberg-Daves, 2014), they also lead to adverse outcomes among women and for society. The long-lasting cultural adherence to symbols of motherhood despite its evident pitfalls suggests that the functions of symbols of motherhood may run deeper than their everyday realities, into the fundamental existential motives of human psyche. In order to examine if cultural constructions of motherhood can be valuable on an existential level, in the third chapter of this thesis I would examine if symbols of motherhood can serve anxiety buffering functions in the face of death.

1.7. Current Research Questions

In this thesis, I aim to investigate the role of cultural legacy in managing the awareness of death. In two lines of research that utilize a TMT paradigm, I will focus on creative achievement as an avenue for cultural legacy production and on symbols of motherhood as an avenue for cultural legacy validation. In addition, in the former line of research I will examine how individual differences in cultural worldviews (i.e., creativity) moderate the need to manage existential concerns.

Creativity in society and its psychological motivations have been at the heart of the writings of Rank (1998\1932), a major inspiration for TMT. Thus far, several TMT researchers have drawn on Rank's insights, for example by examining the relationship between mortality salience, creativity, and guilt (Arndt, Greenberg, Solomon, Pyszczynski,

& Schimel, 1999), the impact of death awareness on creativity (Routledge, Arndt, Vess, & Sheldon, 2008) and its moderation by personality traits such as personal need for structure (Routledge & Juhl, 2012), and the impact of leaving a legacy on creativity when death is salient (Sligte, Nijstad, & De Dreu, 2013). However, the existential anxiety-buffering functions of creative achievement, perhaps the most concrete testament to one's long-lasting, unique existence, have not been studied. Accordingly, the second chapter of this thesis focuses on the anxiety buffering functions of creative achievement in the face of death. In this chapter, to understand the state of knowledge on the relationship between creativity and death awareness, I will conduct a narrative review of the existing TMT literature on creativity as well as a mini meta-analysis of studies that focused on creative performance after MS. Next, I will present findings of a study that examined if creative achievement can serve existential anxiety buffering functions, and if so, for whom.

Symbols of motherhood have been fundamentally shaping human's beliefs and behaviours since the Palaeolithic Period to the present day (Thurer, 1994). From a TMT perspective, this suggests that symbols of motherhood may be a valuable existential resource that can help to cope with the knowledge of one's mortality. Thus far, TMT studies have shown the existential functions of constructs that relate to intergenerational continuity such as parenthood (Yaakobi, Mikulincer, & Shaver, 2014) and the desire to have children (Fritsche et al., 2007; Wisman & Goldenberg, 2005). In addition, multiple studies have evidenced the existential threat inherent in the physical, bodily aspects of the reproductive functions of motherhood, for example in pregnancy and breastfeeding (Goldenberg, 2013). Nonetheless, the female body, and the cultural symbols that evoke it, contains both life and death; both "fascination and horror" (Braidotti, 1994; p.83). To my knowledge, the notion

that symbols of motherhood can serve anxiety-buffering functions in the face of death, rather than acting solely as reminders of one's physical nature, has not yet been examined. In the third chapter of this thesis, I will examine if symbols of motherhood can help people manage the awareness of death by serving existential anxiety buffering functions. In addition, I will examine which symbols of motherhood and under what conditions can serve as an existential anxiety buffer.

In Chapter 2, it is hypothesized that creative achievement would be associated with lesser death thought accessibility among persons who value creativity (i.e., have high levels of creative goals), but not among those who do not, after MS in comparison to controls. In Chapter 3, I examine the hypothesis that symbols of motherhood can serve existential anxiety buffering functions, but only when they do not expose the physicality of the female body. Specifically, it is hypothesized that exposure to an abstract sketched icon of a symbol of motherhood or to symbols of motherhood in realistic pictures of women that do not expose the physicality of the female body after MS would increase levels of implicit self-esteem. Also, it was hypothesized that exposure to symbols of motherhood that are associated with the threatening aspects of the physicality of the female body (e.g., bodily products) would increase levels of disgust after MS. In Chapter 4, I will summarize the findings on the existential functions of cultural legacy and will offer several lines for related future investigations.

The empirical chapters in this thesis focus on the existential anxiety buffering functions of creative achievement (Chapter 2) and of symbols of motherhood (Chapter 3). Each of these empirical chapters represents a published or submitted article that can be read on its own. All chapters are guided by my interest in cultural appearances of legacy, their

symbolic meanings, and its impact on and implications for people's everyday life. I believe that as a whole this thesis makes a significant contribution to the state of knowledge on the existential underpinnings of cultural legacy and its application to a variety of contemporary phenomena across life contexts.

Chapter 2

Can Creativity Beat Death?

A Review and Evidence on the Existential Anxiety Buffering Functions of Creative Achievement[†]

"When I'm gone you will remember my name

I'm gonna win my way to wealth and fame"

Bob Dylan

Creativity has been defined as ‘‘the achievement of something remarkable and new, something which transforms a field of endeavour in a significant way“ (Feldman, Csikszentmihalyi, & Gardner, 1994, p.2). A sense of immortality has been referred to as representing one’s desire to maintain “an inner sense of continuous symbolic relationship, over time and space, with the various elements of life” (Lifton, 1973, p.5). The relationship between creativity and symbolic immortality has been discussed by various prominent scholars. Rank (1968) and Becker (1973) considered the creative action to be a key route to individuation and unique self-expression and as an avenue for immortality, and Yalom (1980) referred to role of leaving behind an imperishable legacy in assuaging death concerns. Similarly, Lifton (1973, 1979) proposed the mode of creativity as a path for

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attaining symbolic immortality. In a similar vein, self-actualization and openness to experience, two constructs associated with creativity, have been proposed to reduce the terror of death (Maslow, 1970; Rogers, 1980). In this article, we will review the evidence on the relationship between creativity and symbolic immortality and present novel findings on the anxiety buffering functions of creative achievement.

The relationship between creativity and symbolic immortality is present in everyday life, as reflected in various anecdotes. British fashion designer Alexander McQueen described spreading his designs "so that when I'm dead and gone people will know that the 21st century was started by Alexander McQueen" (Victoria and Albert Museum, 2015). Gyorgy Fauldy, the Hungarian poet and writer, when asked in his interview by Csikszentmihalyi (1996) why he decided to become a poet replied "Because I was afraid to die" (p.38). In addition, Yoshiki Sasai, a notable Japanese scientist in the field of stem-cell research who supervised and co-authored research papers that were published in *Nature* suffered their subsequent retraction due to falsified contents. Cutting short his long trajectory of creative achievement, Sasai was later found dead in an apparent suicide (Nature News, 2014). Furthermore, real-life events highlight the collective existential impact of the destruction or denunciation of creative achievements. In 2015, Islamic State militants destroyed multiple ancient monuments and artefacts in Iraqi sites such as Nimrud and Mosul (Shaheen, 2015), evoking calls of condemnation from officials worldwide. These examples support the notion that creativity is linked to death and its transcendence through the generation (or destruction) of enduring creative achievements.

The study of Big-C (eminent) creativity (Kaufman & Beghetto, 2009) focuses on creative genius and creative greatness by analysing the lives and works of well-known

creators (e.g., Anais Nin (Kehagia, 2009); Frank Lloyd Wright (Weisberg, 2011)), interviewing renowned persons (Csikszentmihalyi, 1996), or studying people who score high on creativity measures (Kaufman & Beghetto, 2009). These approaches have yielded limited evidence in support of the relationship between creativity and symbolic immortality. For example, in an observational study, the works of 172 classical composers were analysed (Simonton, 1989). It was found that composers' last works were characterized by higher repertoire popularity and aesthetic significance and lower melodic originality and performance duration. This effect persisted after controlling for variables such as eminence, total composition output, and the composer's age when composing the final works. According to Simonton (1989), the melodic simplicity and conciseness of composers' final works suggest that as composers approached death, they became more invested in writing pieces that will secure their reputation over time. In line with this, significant inverse correlations were found between self-reports of a biological-creative mode of symbolic immortality (representing the enduring existential benefits of procreation and productivity) and fear of death (Florian & Mikulincer, 1998).

Terror Management Theory

One theory for studying the relationship between creativity and symbolic immortality is Terror Management Theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986), an established theory in the field of social psychology. Largely derived from the works of cultural anthropologist Ernest Becker (1971, 1973) and psychoanalyst Otto Rank (1941), TMT proposes that the awareness of death serves as a critical motivator of human behaviour. Human beings, like other organisms, are driven by a self-preservation instinct, yet they are unique in their cognitive capacity to understand their finitude. The conflict between one's

mortality awareness and survival goals creates an existential paradox, which may lead to experiencing severe anxiety, or *terror*. The theory maintains that in order to defend oneself from this potential terror, people invest in two interrelated psychological structures. The first is cultural worldviews: a set of socially constructed and validated beliefs that provide meaning, order, a set of principles to live by, and the promise of either literal (i.e., promise of an after-life) or symbolic immortality to socially valued individuals. The second death-anxiety buffering structure is self-esteem. By living up to the standards of value prescribed by cultural worldviews or behaving in culturally valued manner, one achieves a high level of self-esteem. Consequently, as a valuable contributor to something larger, more meaningful, and longer lasting than mere physical existence, one gains the protection from mortality concerns offered by the culture. According to TMT, symbolic immortality may be achieved via long-lasting creative achievements in art or science, perceiving oneself as belonging to a culture extending beyond one's lifetime, having children, and concrete testaments to one's existence such as impressive monuments or great wealth (Solomon et al., 2004). Since its inception, TMT has gained empirical support from hundreds of experiments worldwide (Landau, Sullivan, & Solomon, 2010; Pyszczynski, Solomon, & Greenberg, 2015).

TMT studies on creativity typically utilize the Mortality Salience (MS) hypothesis (Rosenblatt et al., 1989). The MS hypothesis states that if adhering to cultural worldviews and self-esteem buffers mortality concerns, then making mortality salient should increase individuals' need for this symbolic protection, consequently motivating them to uphold, defend, and maintain their worldviews, and strive for enhancing self-esteem. Indeed, mortality reminders have been found to produce various reactions directed toward securing self-esteem and faith in one's cultural worldview (e.g., increased upholding of social values,

nationalistic biases; for reviews, see Burke, Martens, & Faucher, 2010; Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). In a standard experimental design of MS studies, participants in the MS condition complete a measure that prompts them to consider their own mortality while control participants complete a parallel measure on a neutral or aversive topic (e.g., extreme pain). Additional details on variations in mortality inductions and in control conditions are available elsewhere (e.g., Hayes et al., 2010; Landau et al., 2010).

It has been proposed that creativity relates to death in various ways including through its death-denying and life affirming properties (Abra, 1995). In providing an experimental paradigm for examining symbolic mortality strivings, TMT enables the incorporation of empirical evidence into the extant literature on the relationship between creativity and death. Nonetheless, TMT studies on creativity have not been previously described as a whole. In order to promote our understanding of the relationship between creativity and symbolic immortality, we will first examine empirical evidence on the relationship between creativity and symbolic immortality from a TMT perspective.

Creativity and Terror Management Theory

Overall, we have identified 12 papers that examined the relationship between creativity and mortality awareness using a TMT paradigm. Research thus far focused on four main lines of investigation, namely, socio-cultural effects of creative performance following MS, the effects of MS on creative performance, the effect of leaving a legacy on creative performance following MS, and the role of individual trait differences in moderating the effect of MS on creative performance or creative interest. These are presented in detail

below. The characteristics of the 12 papers and their findings on the link between death awareness and creativity are presented in Table 1.

The socio-cultural effects of creative performance following MS. Four papers examined the effects of creative performance following MS on social and cultural constructs. Specifically, creative performance following MS has been found to increase assimilation needs (Arndt, Routledge, Greenberg, & Sheldon, 2005), guilt and social projection (Arndt et al., 1999), and worldview exploration (Routledge & Arndt, 2009), and to decrease nationalistic worldview defence (Routledge, Arndt, & Sheldon, 2004). Findings from the former two papers suggest that to the extent that creativity is an avenue for individuation, it implies a threat to prevailing cultural worldviews. Consequently, when death is salient and needs for cultural worldview validation are high, creativity may lead to adverse psychological outcomes such as guilt unless social ties are in place (Arndt et al., 1999; Arndt et al., 2005). Findings from the latter two papers suggest that creativity, through its association with divergent thinking and open-mindedness, may promote openness towards divergent worldviews in order to maintain psychological security in the face of death (Routledge et al., 2004; Routledge & Arndt, 2009). Taken together, the above findings highlight the interplay between creativity, cultural worldviews, and symbolic immortality strivings. Specifically, when death is salient, creativity may promote a more flexible management of symbolic immortality needs (e.g., Routledge & Arndt, 2009), and may confer existential benefits if it is compatible with one's cultural worldviews.

The effects of MS on creative performance. Three papers examined the effects of MS on creative performance (Greenberg et al., 1995; Long & Greenwood, 2013; Routledge, Arndt, Vess, et al., 2008). Of these three papers, one paper examined creative performance

that either threatened social connections (self-oriented creative performance condition) or enhanced social connections (community-oriented creative performance condition). It was found that MS significantly decreased creativity for participants in the self-oriented condition, but not for participants in the community-directed condition, when compared to control participants (Routledge, Arndt, Vess, et al., 2008). These findings suggest that when death is salient, creativity may be enhanced when it is compatible with pro-social cultural worldviews (Routledge, Arndt, Vess, et al., 2008).

Another paper examined the effects of explicit (written) and implicit (subliminal) MS on creativity (Long & Greenwood, 2013). In this paper, creativity was operationalized as the production of humorous captions that were assessed by raters or self-rated (Long & Greenwood). When self-assessed, It was found creativity was facilitated following explicit (but not implicit) MS in comparison to the control condition. When other-assessed, creativity was enhanced following implicit death primes, but hindered when MS was explicit in comparison to the control condition (Long & Greenwood). These findings highlight the need to be mindful of priming modality and creativity assessment methods in order to promote our understanding of MS on humour production (Long & Greenwood).

Finally, one paper examined the use of cultural objects in two practical tasks (Greenberg et al., 1995). Participants were requested to separate sand from a black dye (task 1) and to hang a crucifix on the wall (task 2) using an object of their choice. Available objects included either cultural (i.e., flag, crucifix, respectively; cultural-objects condition) or neutral (i.e., white cloth, block of wood, respectively; neutral-objects condition) objects. It was found that MS participants in the cultural-objects condition took significantly longer to complete the tasks and considered significantly more alternative solutions in comparison to

MS participants in the neutral-objects condition and controls (Greenberg et al., 1995). These findings suggest that when death and cultural icons are salient, problem-solving creativity may decrease while creative fluency may increase. It may be that while MS increased creativity, this was countered by increased avoidance of cultural worldviews violation by the manipulation of cultural objects (Greenberg et al., 1995). Taken together, evidence from the above three papers highlights the relation between death awareness and creativity, and suggest that when death is salient, the creative act may be shaped by its existential meanings.

In order to enhance the state of knowledge on the relationship between MS and creativity and considering the comparability of the studies in the above three papers, we conducted a mini meta-analysis on the impact of MS on creativity (Table 2). The inclusion criteria were: 1. papers categorized as examining the effects of MS on creative performance; and 2. having an other-assessed creativity-related DV. A positive effect size (Cohen's *d*) indicates greater creativity under MS in comparison to the control condition. When the MS condition had more than one cell, we selected the condition that according to theory would result in increased creativity. To enable inferences beyond these studies, we used random-effects models, which assume different effect sizes may be underlying each study (Borenstein, Hedges, Higgins, & Rothstein, 2010). We contacted the first authors of all three papers with requests for additional data. Effect sizes were calculated using an online calculator (Lipsey & Wilson, 2001), based on *M*, *SD*s, and *n* per cell, where data was made accessible. When that was not the case, effect sizes were calculated based on the data presented in the paper. To correct for the upward bias of effect sizes in small samples, we applied the formula provided by Hedges (1981). The meta-analysis was conducted on SPSS 19.0 using syntax provided by Field & Gillett (2010). Heterogeneity was not significant, $p >$

.47, indicating no systematic relationship between study attributes and effect sizes. The weighted mean effect size for the relationship between MS and creativity was 0.30, representing a small to medium effect by Cohen's (1988) criteria. In the field of psychology, this effect size is comparable to the mean effect size in motivation studies (Richard, Bond Jr, & Stokes-Zoota, 2003).

Legacy effects on creative performance following MS. The effect of leaving a legacy on creative performance following MS was examined in a single paper presenting a series of studies (Sligte et al., 2013). In two studies, the creative task was naming an animal in a zoo, and legacy was manipulated by the animal's life expectancy, that is, short (no legacy) vs. long (legacy). It was found that MS participants in the legacy condition had significantly higher levels of originality in comparison to those in the no-legacy condition (Study 1). When manipulating the social value of naming an animal, it was found that the same pattern persisted when the task was socially valuable, but not when it was not socially valuable (Study 2). Taken together, these findings suggest that the promise of legacy increases creativity when death is salient, particularly when creativity is aligned with cultural worldviews (Sligte et al., 2013). In study 3, the creative task involved brainstorming on ways to improve the environment, and legacy was manipulated by whether one's ideas will bear one's name and will be transferred for others to use. It was found that after performing a creative task, MS participants had higher Death-Thought Accessibility (DTA) under legacy when compared to no legacy (Study 3) (Sligte et al., 2013). The authors suggested this finding may be due to the experience of guilt following the creative task, which consequently led to higher DTA (Sligte et al., 2013). Indeed, considering the fact that participants completed an individualism–collectivism questionnaire prior to the creative task,

it may be that individualism concerns were primed when mortality was salient, resulting in guilt (Arndt et al., 1999). Nonetheless, the finding demonstrates the relationship between enduring creative products, MS, and DTA.

Individual differences in MS effects on creativity. The role of individual trait differences in moderating the effect of MS on creative performance or creative interest has been examined in five papers. Personal Need for Structure (PNS) reflects the extent of one's wish to perceive the world in clear, unambiguous terms (Thompson, Naccarato, Parker, & Moskowitz, 2001). In response to mortality reminders, persons with low PNS demonstrated increased creativity as measured by a T-shirt design task while the creativity of persons with high PNS was unaffected (Routledge & Juhl, 2012). In another study, a creativity task was used as an indicator for participants' decision-making patterns. Following MS, participants were asked to select one of six design patterns that offered differing degrees of creative expression. It was found that persons with high, but not low, self-esteem opted for a high-risk creativity task which allowed greater creative expression (Landau & Greenberg, 2006; study 3). Others have found that participants with lower, but not higher, levels of neuroticism had significantly increased creative interest following MS (Xu & Brucks, 2011).

Another paper examined the relationships between creative interest, creative tendency, and DTA, yielding mixed results (Xu, Brucks, & Guo, 2013). In addition, in the aforementioned study by Sligte et al. (2013; Study 3), it was found that MS participants with high, but not low, levels of individualism in the legacy condition had significantly higher levels of originality and creative fluency in comparison to those in the non-legacy condition. Overall, the above studies show that personal traits' differences may moderate the effect of MS on creativity. In particular, findings suggest that persons who are more existentially

secure (e.g., higher self-esteem; Abeyta, Juhl, & Routledge, 2014) or have less to benefit from rigid worldview defence (e.g., low PNS; Juhl & Routledge, 2010) may manage symbolic immortality needs in the face of death more flexibly. Consequently, creativity may be enhanced, particularly when it involves legacy.

The Current Study

The above review of TMT literature on creativity highlights various elements in the relationship between creativity and death. In terms of creativity facilitation, these include the potential pre-conditions for creativity to be existentially beneficial (i.e., compatibility with cultural worldviews) and the role of leaving a legacy in enhancing creativity when death is salient. In terms of existential value, the evidence demonstrates the loosing effect of creativity on the management of symbolic immortality needs when death is salient, and the link between legacy, death awareness, and DTA. Overall, the bulk of the evidence reviewed support the notion that creativity plays an important role in the management of existential concerns. It follows that creativity may serve as an existential anxiety buffer in the face of death. Indeed, the association between creative achievement and symbolic immortality has been supported both theoretically (Lifton, 1973; Solomon et al., 2004) and by observational research (Simonton, 1989). Nonetheless, while one paper included a manipulation of legacy (Sligte et al., 2013), the relationship between creative achievement and symbolic immortality has not yet been directly examined.

If creativity is an avenue to symbolic immortality, then the promise of impactful, long-lasting cultural contributions inherent in creative achievement should be associated with lesser DTA when death is salient. However, it is noteworthy that high levels of creative achievement are generally exhibited by a minority of persons within a given population

(Eysenck, 1995). Accordingly, creative achievement may not comprise a universal existential anxiety buffer but rather one that is accessible particularly among persons who value and pursue creativity as a central part of their worldview. From a TMT perspective, this means that creative achievement may work in tandem with creativity-related cultural worldviews (e.g., creative goals) in order to buffer against the awareness of death. In addition, it has been found that conscious thoughts of death lead to higher DTA after a delay, once active suppression relaxes (e.g., Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994). Accordingly, if creative achievement is an existential anxiety buffer, then it should defend against elevated DTA following MS, particularly among those who value and pursue creativity. We hypothesize that creative achievement would be associated with lesser DTA among persons who value, but not among persons who do not value, creativity, after MS in comparison to controls.

Table 1. Papers on the relationship between mortality salience and creativity (N = 12)

	Creativity task	Dependent variable	Measurement of dependent variable	MS-creativity findings
Arndt et al., 2005	Writing a story	Guilt (S1), positive engagement (S2)	State Guilt scale of the Guilt Inventory (Kugler & Jones, 1992); positive engagement was comprised of the positive mood scale (Watson & Clark, 1992), the vitality scale (Ryan & Frederick, 1997), and the Problem-Solving Creativity subscale of the Self-Description Questionnaire (Marsh & O'Neill, 1984).	Following MS, creative task participants who received neutral personality feedback reported significantly more guilt when compared to controls. In addition, MS creative task participants showed significantly less guilt when first receiving feedback emphasizing their conformity than when receiving neutral feedback (S1); following MS, participants who wrote about goals that others value reported significantly more positive engagement than participants who wrote about self-value goals (S2).
Arndt et al., 1999	Writing a story	Guilt (S1, S2), social projection of attitudes (S3)	State Guilt scale of the Guilt Inventory (Kugler & Jones, 1992), 16 items from the Minnesota Multiphasic	Creative task participants reported significantly more guilt following MS when compared to controls (S1, S2); MS creative-task participants exhibited significantly higher social projection when compared to all other participants (S3).

			Personality Inventory-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989).	
Greenberg et al., 1995	Separating sand from a black dye, and hanging a crucifix on the wall	Creative fluency, time	Number of alternative solutions considered, task completion time.	MS participants in the cultural objects-condition took significantly longer to complete the tasks and considered significantly more alternative solutions in comparison to MS participants in the neutral-objects condition and controls.
Landau & Greenberg, 2006	n.a.	Preference for one of six design patterns that offered differing degrees of creative expression (S3)	The chosen pattern.	Following MS, participants with high self-esteem opted for a high-risk creativity task which allowed greater creative expression, while persons with low self-esteem opted for a low-risk task, which allowed limited creative expression.

Long & Greenwood, 2013	Generating humorous cartoon captions	Humorousness	Self-assessed and assessed by external raters.	Explicit MS participants rated their cartoons' captions as significantly more humorous captions in comparison to control participants. When the captions were rated by outside rater, the reverse pattern was found. When using subliminal primes, death-primed participants showed significantly higher levels of creativity in comparison to controls.
Long & Greenwood, 2013	Generating humorous cartoon captions	Humorousness	Self-assessed and assessed by external raters.	Explicit MS participants rated their cartoons' captions as significantly more humorous captions in comparison to control participants. When the captions were rated by outside rater, the reverse pattern was found. When using subliminal primes, death-primed participants showed significantly higher levels of creativity in comparison to controls.
Routledge & Juhl, 2012	Creative T-shirt design	Creativity	Assessed by external raters.	In response to mortality reminders, persons with low PNS demonstrated significantly increased creativity while the creativity of persons with high PNS was unaffected.
Routledge & Arndt, 2009	Creative T-shirt design	General (S1), nationalistic (S2),	Exploration scale (S1) (Green & Campbell, 2000),	Participants who engaged in a creative task (S1, S2) or read an essay valuing creativity (S3) demonstrated significantly higher

		and religious (S3) worldview exploration	rating worldview-related film descriptions.	levels of worldview exploration following MS, when compared to control participants.
Routledge et al., 2008	Creative concert proposal	Creativity	Level of creativity on the rock star promotion task as assessed by two independent coders.	Following MS, community-oriented participants were significantly more creative when compared to self-oriented participants; MS significantly decreased creativity for participants in the self-oriented condition, but not for participants in the community-directed, when compared to control participants.
Routledge et al., 2004	Creative T-shirt design	Nationalistic worldview defence	Rating an anti-American essay.	Following MS, creative task participants showed significantly less worldview defence in comparison to conformity task participants.
Sligte et al., 2013	Naming an animal (S1, S2); brainstorm (S3)	Originality, creative fluency	Unique responses index (originality), sum of unique response (fluency)	MS participants showed significantly higher levels of originality under legacy in comparison to no legacy (S1). The same was found in the socially valued creativity condition in S2 and among those high on individualism (for originality and fluency) in S3. Under no legacy, MS participants had

				significantly lower fluency when compared to controls (S1, S2). In the negative social valuation condition, MS participants were more fluent and controls were more original under legacy in comparison to no legacy (S2). After performing a creative task, MS participants had higher death-thought accessibility under legacy when compared to no legacy (S3).
Xu et al., 2013	n.a.	Creative interest, death-words accessibility	Self-rated momentary interest in specific creative activities, reaction time task	MS increased creative interest (S1), particularly among those with a pre-existing creative tendency (S2) and in creative activities with a low level of challenge (S3) in comparison to a control condition. Following MS, persons who wrote about previous creative endeavours showed significantly greater suppression of death-related words in comparison to persons who wrote about past spending experiences (S4). No comparison of these two groups with the control condition was reported, and the control group completed no (MS) comparable task.

Xu & Brucks, 2011	n.a.	Creative interest	Self-rated momentary interest in specific creative activities,	Participants with lower levels of neuroticism, but not those with higher levels of neuroticism, had significantly increased creative interest following MS.

MS = Mortality Salience, n.a. = not applicable

Table 2. Mini meta-analysis of the effect of death awareness on creativity

Study	Dependent variable	Rating method	MS condition	Cohen's *d*	95% CI	N[a]
Greenberg et al., 1995[b]	Creative fluency (number of solutions)	One blind rater	Cultural objects, explicit	0.86	0.23 – 1.50	52
Long & Greenwood 2013[c]	Creativity of cartoon captions	Six independent raters	Explicit	-0.53	-1.04 – -0.04	63
			Implicit	0.57	0.03 – 1.12	54
Routledge et al., 2008[d]	Creativity of ideas	Two independent raters	Community-oriented, explicit	0.37	-0.41 – 1.17	49
Weighted mean effect size				0.30	-0.36 – 0.96	

[a] All samples were US students.
[b] Effect size was calculated based on the t statistic, t(48) = 2.77 and represents a 1 (n = 14) vs. 3 (n = 38) comparison between MS cultural-objects condition and the other three conditions.
[c] Data was treated as two separate studies given the independency of samples.
[d] Effect size was calculated based on the F statistic, F (1, 23) = 0.91.

Methods

Participants and Recruitment

Participants were 108 undergraduate psychology students,[1] aged 18-33 (M_{age} = 19.74, SD_{age} = 2.57), of whom 79% were female. Students received partial course credit for their participation.

Procedure

This online study had a 2 (creative achievement: high, low) X 2 (creative goals: high,

[1] Five participants identified the manipulation, and three participants showed response bias. Accordingly, these eight participants were excluded from analysis. All data exclusions are reported in accordance with APA standards.

low) X 2 (mortality salience: high, low) between-subjects design and was presented as a study on personality. Participants completed measures of creative achievement and creative goals that were embedded within filler questionnaires. Next, participants were randomly allocated to the MS condition or the control condition, and completed either the MS or control measurement, respectively. This was followed by the PANAS, which served as a delay and distraction task because previous research has shown that MS effects are manifested when persons no longer attend consciously to thoughts elicited by the manipulation (Greenberg et al., 1994). Participants proceeded to complete the dependent variable, the DTA measure (Greenberg et al., 1994).[2] Finally, participants were asked what in their opinion was the purpose of the study, provided demographic details, and were thanked and debriefed.

Materials

Creative achievement. Creative achievement was assessed by the Creative Achievement Questionnaire (CAQ; Carson, Peterson, & Higgins, 2005). The CAQ measures creative accomplishments in 10 domains (e.g., visual arts, music, inventions) via self-report while focusing on concrete public accomplishments (e.g., reviews in national publications). The scoring of the CAQ assigns higher weights to higher levels of creative achievements, which typically leads to a positively skewed distribution of the data (Carson et al., 2005). The index score was computed as the mean of ratings across domains. Because the 10 domains do not seem to have one underlying factor (Carson et al., 2005; Silvia, Kaufman, & Pretz, 2009), the calculation of a meaningful internal consistency measure is hindered. The CAQ demonstrated good test-retest reliability (r = .81) and good discriminant validity in a sample of students (Carson et al., 2005), and can

[2] Participants then completed a worldview defence measure based on Greenberg et al. (1990) (see Appendix 1). This measure was not included in the main analysis.

be used to detect both individual and group differences in creative achievement (Carson, Peterson, & Higgins, 2003).

Creative goals. A measure of creative goals was custom designed for this study based on the WASSUP (Willingly Approached Set of Statistically Unlikely Pursuits; Johnson & Carver, 2006) in order to operationalize the pursuit of creative goals, i.e., having creativity as a central part of one's cultural worldview. The measure included four items ($\alpha = .79$): 1. You will produce a great creative work; 2. You will make an important contribution in the field of art or science; 3. Your creative work will be acknowledged by experts in your field; 4. You will create work with enduring value that is original and useful. In order to obscure the purpose of this measure, the above items were embedded within the 5-item WASSUP friends subscale (e.g., "You will have 10 close friends"). Items were rated on the WASSUP scale, ranging from 1 (NO CHANCE I will set this goal for myself) to 5 (Definitely WILL set this goal for myself). To examine the factorial structure of the creative goals measure, we conducted an exploratory factor analysis using the Maximum Likelihood method. The analysis and scree plot confirmed the one-dimensionality of the measure, accounting for 62% of the variance, KMO = .75, χ^2 (2) = 5.65, p = .06.

Mortality Salience. In the MS condition, participants completed the Fear of Death scale (Templer, 1970), which is comprised of 15 true/false statements (e.g., "I am very much afraid to die"). This measure has been used as a mortality prime in multiple TMT studies (e.g., Bassett, Van Tongeren, Green, Sonntag, & Kilpatrick, 2015; Cox et al., 2009). In a meta-analysis of 277 TMT studies (Burke et al., 2010), the use of death surveys to prime mortality showed comparable MS effects to the standard MS manipulation (Rosenblatt et al., 1989). Control participants completed 15 parallel

statements on fear of public speaking (e.g., "I am very much afraid to speak in public") (Cox et al., 2009).

Affect. Affect was assessed by the 20-item Positive and Negative Affect Scales (PANAS; Watson, Clark, & Tellegen, 1988). Items were rated on a scale ranging from 1 (very slightly or not at all) to 5 (extremely). A total score was computed for positive affect (10 items; $\alpha = .88$) and negative affect (10 items; $\alpha = .91$) as the mean of items' ratings.

Death-thought accessibility. The accessibility of death thoughts was assessed using a 25-item word fragment completion task, in which six words could be completed as either death-related words or death-unrelated words (Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997). For example, the word fragment "SK_ _ L" could be completed as either SKULL (death-related) or SKILL (death-unrelated). The possible death-related words were *buried, dead, decay, skull, grave,* and *old*. The number of death-related words served as the DTA measure. To ascertain that DTA is independent of ***negative-thought accessibility***, six of the 25 word stems could be completed as either negative (death-unrelated) words or neutral words (Hart, 2014; Yaakobi, 2015). The possible negative words were *stress, sad, pain, guilt, sorrow*, and *shame*. For example, the word fragment "STRE_ _" could be completed as either STRESS (negative) or STREET (neutral). The number of negative words served as the negative-thought accessibility measure.

Results

Descriptive statistics for the study independent variables are shown in Table 3. There were no significant correlations between the study independent variables, *p*s > .77.

Table 3. Descriptive statistics of independent variables (N = 108)

	M (SD)	Min – Max	Alpha Cronbach	Skewness[a]	Kurtosis[b]
Creative achievement	0.94 (0.90)	0 – 4.60	n.a.	1.84	3.60
Creative goals	2.87 (1.02)	1 – 5	.79	-0.12	-0.86
			n		
Mortality salience		High		Low	
		51		57	

n.a. = Not applicable
[a] Skewness Standard Error = 0.23, [b] Kurtosis Standard Error = 0.46

To examine the effect of creative achievement, creative goals, and condition on DTA, we conducted a linear regression. The independent variables creative achievement (centred), creative goals (centred), and condition (dummy coded; 1 = high MS) were entered in the first step, interaction terms for each two combinations were entered in the second step, and the interaction term for the three predictors was entered in the third and final step. The dependent variable was DTA. The results of the regression are presented in Table 4. In the first and second steps of the regression, no effects were significant. In the final model, there were no significant main effects or 2-way interaction effects. As hypothesized, there was a significant 3-way interaction between creative achievement, creative goals, and condition, β = -.35, B = -.45, Standard Error (SE) = .22, t = -2.02, p = .046, 95% Confidence interval (CI) = -0.88 – -0.01, R^2 = .10.

To follow-up on the 3-way interaction, we used the SPSS PROCESS macro, Model 3 (moderated moderation) (Hayes, 2013). The independent variable (X) was condition (dummy coded). The moderator (M) was creative achievement (centred). The proposed moderator (W) was creative goals (centred). The dependent variable (Y) was DTA. The breakdown of the 3-way interaction is shown in Figure 1a for high levels of creative goals and in Figure 1b for low levels of creative goals. It was found that the

relationship between creative achievement and condition was significant at high levels (+1 SD) of creative goals, B = -.96, SE = .42, t = -2.29, *p* = .02, 95% CI = -1.79 to -0.13, and non-significant at low levels (-1 SD) of creative goals, *p* > .85. Thus, as hypothesized, only among participants with high creative goals, creative achievements were associated with reduced DTA under MS. Next, we examined the effect of condition on DTA at high levels of creative goals. Among participants with low levels of creative achievement, the observed patterns suggest that MS was associated with increased DTA, B = .90, SE = .52, t = 1.75, *p* = .08, 95% CI = -0.12 – 1.93. Among those with high levels of creative achievement, MS was associated with decreased DTA, B = -.83, SE = .47, t = -1.75, *p* = .08, 95% CI = -1.76 – 0.11. The latter patterns are marginally significant, possibly due to the small sample size. Nonetheless, taken together the results show that only participants with high levels of creative goals and high creative achievements showed reduced DTA after reminders of mortality as compared to the control condition.

In order to examine the regression analysis for multivariate outliers and their levels of influence, we followed the guidelines provided by Stevens (1984). First, we computed Mahalanobis Distances (MD), M = 6.93, SD = 10.12. Considering our analysis had three predictors and a sample size of approximately n =100, MD > 16.45 was selected as the cut-off point for multivariate outliers. Seven cases exceeded this cut-off point. Second, to determine if any of these seven cases were influential points, we calculated Cook distances, M = 0.01, SD = 0.05. Cook distances for all of the seven cases were <.46, i.e., below the cut-off point for influential outliers of > .1. Thus, no influential multivariate outliers were found.

Table 4. Hierarchical regression predicting death-thought accessibility (*N*=108)

	Hierarchical model		
	B	SE B	*B*
Step1			
Constant	2.25	.16	
Condition (1= MS)	.24	.28	.10
CA	.07	.13	.06
CG	.16	.11	.13
Step 2			
Constant	2.25	.16	
Condition (1= MS)	.24	.23	.10
CA	.19	.19	.15
CG	.30	.16	.26[a]
Condition * CA	-.28	.25	-.15
Condition * CG	-.26	.22	-.16
CA * CG	-.05	.11	-.05
Step 3			
Constant	2.24	.15	
Condition (1= MS)	.25	.22	.11
CA	.36	.20	.27[a]
CG	.28	.16	.24[a]
Condition * CA	-.50	.27	-.28[a]
Condition * CG	-.21	.22	-.13
CA * CG	.24	.18	.24
Condition * CA * CG	-.45	.22	-.35*

MS = Mortality Salience, CA = Creative Achievement, CG = Creative Goals, SE = Standard Error
Note. $R^2 = .03$ for step 1, $\Delta R^2 = .03$ for step 2, $\Delta R^2 = .04$* for step 3.
* $p < .05$, [a] $.05 < p < .1$

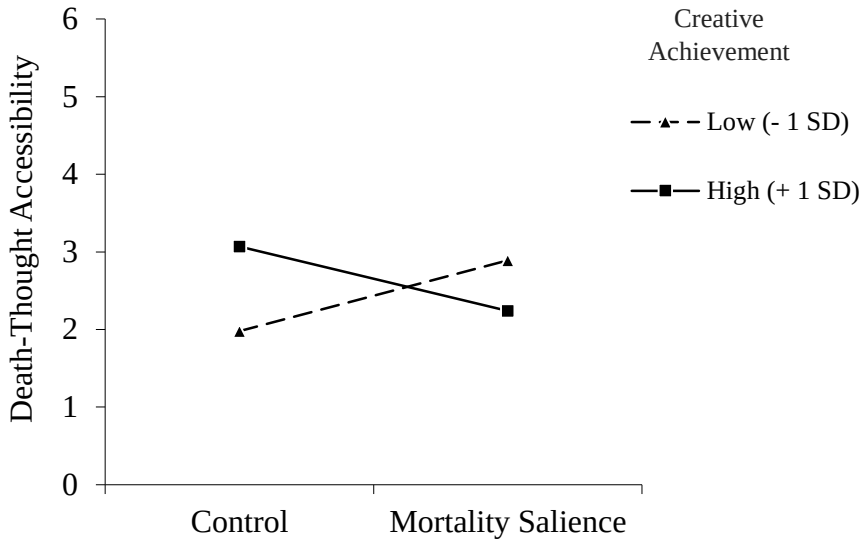

Figure 1a. The interaction between condition and creative achievement at high levels (+1 SD) of creative goals

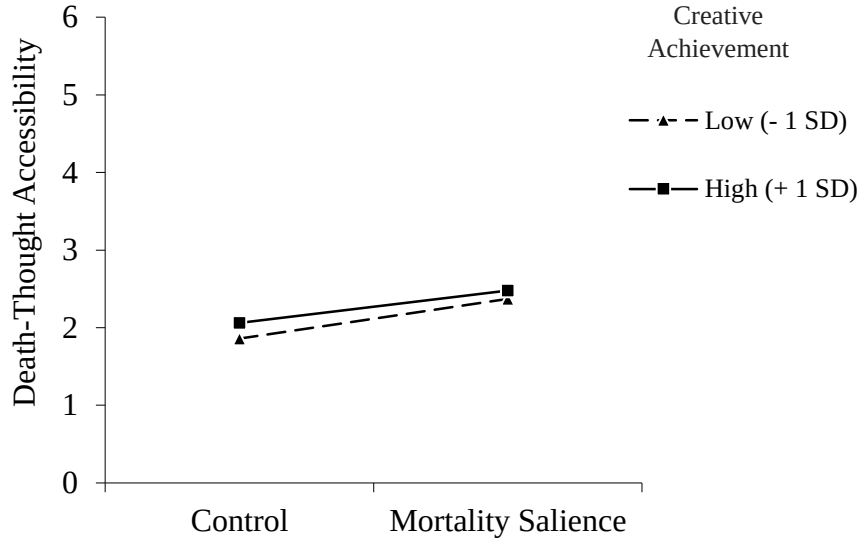

Figure 1b. The interaction between condition and creative achievement at low levels (-1 SD) of creative goals

In order to exclude the possibility that the interaction effect was due to affect, we re-ran the analysis with negative-thought accessibility as a covariate, and with positive and negative affect as covariates. In these two separate analyses, the 3-way interaction remained significant, *p*s < .05. To examine if the effect of the interaction is specific to DTA, we ran the original analysis with negative-thought accessibility, negative affect, and positive affect as the dependent variable. In each of these three separate analyses, the interaction was not significant, *p*s > .47. These findings support the notion that the decrease in DTA among persons with high levels of creative goals and high creative achievements after MS in comparison to controls is not due to changes in affect.

Discussion

The relationship between creativity and symbolic immortality has been long acknowledged by a wide range of scholars. In a narrative review of the literature, we found 12 papers that examined creativity utilizing a TMT paradigm. Overall, these TMT studies revealed that reminders of mortality can facilitate creativity within the context of people's cultural and personal values. Furthermore, it was found that death awareness affects the pursuit of social and psychological needs after creative engagement. A mini meta-analysis of the impact of death awareness on creativity resulted in a small-medium weighted mean effect. Thus, the presented findings suggest that creativity (for those who value creativity) may function as an existential anxiety buffer that helps to manage existential concerns. In view of this, we examined the anxiety buffering functions of creative achievement in an experimental study that manipulated death awareness. It was found that among participants with high, but not low, levels of creative goals, creative achievement was associated with reduced DTA under MS as compared to the control condition. These findings show that creative achievement serves as an existential anxiety

buffer, particularly among people for whom creativity constitutes a central part of their cultural worldview.

Creative achievement and Terror Management Theory

From a TMT perspective, current findings are in line with a host of evidence on increased strivings for various forms of symbolic immortality in response to death reminders. In line with Lifton's (1973) notion of one's enduring contributions as way to attain symbolic immortality research revealed that MS can increase; the willingness to self-sacrifice for an ideological cause (Routledge & Arndt, 2007), legacy-building needs (Wade-Benzoni, Tost, Hernandez, & Larrick, 2012), the appeal of fame (Greenberg et al., 2010), the desire to work (Yaakobi, 2015), and the desire for offspring (Fritsche et al., 2007; Wisman & Goldenberg, 2005). The current findings support the notion that creative achievement may be yet another avenue for symbolic immortality, particularly among individuals who value creativity. Importantly, the current study represents an important first step towards establishing creative achievement as an anxiety-buffering mechanism (see Harmon-Jones et al., 1997). According to TMT, one way to cope with death awareness is to re-affirm one's cultural worldviews and beliefs (Greenberg et al., 1990), for example by endorsing moral values (Bassett et al., 2015). To further examine the anxiety buffering properties of creative achievement, it may be useful to focus on creativity-related worldview defence measures. Specifically, because values such as self-direction and universalism are valued by creative persons and are associated with creative accomplishment (Dollinger, Burke, & Gump, 2007), threatening these values, for example by presenting an essay that derogates them, may lead to their defence in creative individuals when death is salient. However, high levels of creative achievement may buffer this effect, so that highly accomplished creative persons would not show an increase in worldview defence under MS. Because lesser endorsement of values such as

universalism is associated with less concern for others and society as a whole (Schwartz, 2007), this line of future research may have implications for understanding the existential underpinnings of immoral behaviours in creative pursuits (Vincent & Polman, 2016).

Creative Achievement and Symbolic Immortality: A Mixed Blessing?

The integration of creative achievement and TMT research has important implications for the field of creativity research. If creative achievement can function as an existential anxiety buffer, than creativity may inspire creative motives that function to defeat, deny, and cope with the ever-present awareness of death (Abra, 1995). Although creativity is in general associated with positive contributions to humanity, the need to understand the dark side of creativity (Cropley, Kaufman, & Cropley, 2008) is highlighted by events such as the 2015 Paris attacks. In terrorist organizations, achievement motivations may contribute to destructive innovations (Gill, Horgan, Hunter, & Cushenbery, 2013). Thus, understanding which death-related motivations underlie malevolent creative acts could enhance counter-terrorism practices. The existential functions of creative achievement may operate by conferring collective symbolic immortality ("My cultural contribution will outlive me") (Lifton, 1973) or personal symbolic immortality ("I will be remembered after I die") (Shneidman, 1973; Wojtkowiak & Rutjens, 2011). Accordingly, death-related motivations of *malevolent creativity*, that is, creativity driven by consciously negative intentions that yields personal benefits for the creator but has negative consequences for others (Cropley et al., 2008) may be driven by the desire to leave an enduring, albeit destructive cultural impact (e.g., the 9/11 attacks) or by the promise of a personal legacy after death (e.g., remembrance as martyr). It would therefore be opportune to examine the role of personal or collective immortality motivations in different malevolent creative acts (e.g., ideological vs. self-promoting malevolent self-sacrifice).

Creative acts of different valence may have a different impact on collective existential security levels. Future studies could examine if *conscientious creativity*, that is, ethical, constructive creativity that is driven by positive intentions and has positive consequences for society (Kampylis & Valtanen, 2010) confers collective existential protection through increasing personal hope or a belief in human social-moral progress (Rutjens, van Harreveld, van der Pligt, van Elk, & Pyszczynski, 2016; Wisman & Heflick, 2016). Conversely, studies could determine if there is an adverse collective existential impact to malevolent creative acts. For example, failure to prevent terrorist attacks is likely to arouse outrage at the state's inability to provide protection (Fischbacher-Smith, 2016), thus undermining the symbolic existential protection conferred by national identity and symbols (e.g., Greenberg et al., 1990). Overall, creative achievements may be driven by different existential motivations and have valence-specific collective outcomes. Thus, the current findings may contribute to the construction of a new framework to understand the underpinnings and impact of death-motivated creative pursuits.

Practical Implications

In terms of practical implications, understanding the impact of creativity on existential concerns and consequently on everyday attitudes and behaviours may serve to promote creative achievement, thus benefiting individuals (Plucker et al., 2004) and advancing human achievement (Forster, 2012). Creativity is facilitated by person variables (Rhodes, 1961) such as risk-taking (Davis, Rimm, & Siegle, 2011; Sternberg, 2006), intrinsic motivation (Amabile, 1983; Kieran, 2014), and perseverance in face of initial difficulties (Sternberg, 2006). Accordingly, associating creativity with existential security may promote creative achievement in individuals by increasing perceived (symbolic and everyday) benefits and decreasing perceived costs of creative pursuits (e.g., risky

investment). Understanding the existential meanings of an enduring creative achievement may be particularly valuable for expert (Pro-c) creative persons as they navigate motivational and creative challenges en route to eminence (Big-C) (Kaufman & Beghetto, 2009; Olszewski-Kubilius, Subotnik, & Worrell, 2016), for example, by identifying clear goals in terms of impact on the field (Amabile & Kramer, 2011). In educational settings, communicating the link between creativity and existential security may be valuable in enhancing students' positive beliefs regarding their creative pursuits (Wadaani, 2015) as a part of a wider strategy of supporting students' intrinsic creativity motivations in their learning environment (Beghetto & Kaufman, 2014). Overall, the findings of the current study may be useful in promoting creative achievement and creative motivation in people with varying levels of creative expression.

Limitations

The current study is not without limitations. The sample in this study consisted of psychology students. It has been shown that students or graduates of non-creative professions have significantly lower levels of creative achievement in comparison to those of creative professions (Silvia & Nusbaum, 2012; Vellante et al., 2011). This suggests that the anxiety buffering functions of creative achievement may be more robust among students of creative professions, who by definition consider creativity as central to their cultural worldview (Dollinger et al., 2007). By the same token, future studies may examine the anxiety buffering functions of creative achievement in individuals with established high levels of creative achievement (e.g., Chavez-Eakle, Lara, & Cruz-Fuentes, 2006), who may be particularly resilient to the awareness of death. The latter direction would further enable the incorporation of an objective measure of creative achievement that is not open to self-report bias. Finally, our mini meta-analysis represents the current state of knowledge on the relationship between death awareness

and creativity. While the small number of studies included may limit its precision (Borenstein et al., 2010), the interpretation of this analysis is enhanced by the narrative review.

Conclusion

The current study is the first to show the existential anxiety-buffering functions of creative achievement among persons with high creative goals. Specifically, we found that creative achievement was associated with lower DTA under MS in comparison to controls among persons with high creative goals. In line with Rank's (1968) notion of the artist's desire self-immortalize in one's work, our findings suggest that those who pursue creativity and produce significant creative contributions may benefit from existential security in the face of death. The current findings, narrative review, and mini meta-analysis advance existing research on the link between creativity and death and have implications for the promotion of creative achievement and intrinsic motivation in creative individuals and in educational settings. The integration of creativity and TMT provides a promising (and creative) avenue for understanding death-related creativity motivations and their impact on individuals and society for scholars, educational policy makers, and creative persons.

Chapter 3

Immortal Motherhood:

Evidence That Symbols of Motherhood Can Function as an Existential Anxiety Buffer[†]

"Mothers' arms are made of tenderness, and sweet sleep blesses the child who lies therein"

V. Hugo (1887)

The symbol of motherhood in contemporary society idealizes the mother as all-giving, self-sacrificing, perfectly loving, tender-hearted, and all-empathic (Thurer, 1994). This idealized symbol is presented in media images of pregnancy (Douglas & Michaels, 2005), breastfeeding images on Instagram (Locatelli, 2017), and online birth videos (Longhurst, 2009). While motherhood is often depicted in terms of individual achievement, it is not a mere personal experience but a fundamental collective experience (Douglas & Michaels, 2005). The symbol of motherhood may be considered an archetype that highlights the importance of caring, selflessness, love, and devotion (Rich, 1976; Stearney, 1994). Indeed, the symbol of motherhood serves as an absolute representation of 'Good'; encapsulating strong positive associations such as protection, nourishment, and altruism (Buchanan, 2013).

Symbols of motherhood are fundamental to culture, shaping everyday practices, social policies and ideologies, and politics (Douglas & Michaels, 2005; Rich, 1976;

[†] This Chapter is based on: Perach, R., & Wisman, A. (under review). Immortal motherhood: Evidence that symbols of motherhood can function as an existential anxiety buffer.

Thurer, 1994; Vandenberg-Daves, 2014; West, 2003). Cultural beliefs on motherhood that manifest in symbols of motherhood can lead to adverse outcomes among women in personal (Liss, Schiffrin, & Rizzo, 2013; Rizzo, Schiffrin, & Liss, 2013; Williams, Donaghue, & Kurz, 2012), social (Dillaway & Paré, 2008; Lee, Vasileiou, & Barnett, 2017), and work (Correll & Benard, 2007; Gutierrez-Domenech, 2005) domains and for society at large (Badinter, 2011; Tanturri et al., 2015). Considering the long-lasting cultural adherence to symbols of motherhood (Thurer, 1994), it is important to better understand the psychological functions that symbols of motherhood serve in society and how these functions could be utilized to enhance rather than undermine women's wellbeing.

Cultural beliefs, expectations, and ideals that define motherhood have been often referred to as the "myths" of motherhood (Badinter, 1982; Hare-Mustin & Broderick, 1979; Thurer, 1994). In contemporary society, non-dominant motherhood constructions include different subtypes of motherhood stereotypes that draw attention to racial, age, ethnic, economic, and work-family balance characteristics of mothers (Arendell, 2000; Shaw & Giles, 2009; West, 2003; Yardley, 2008). This paper focuses on the capacity of symbols of motherhood, and the underlying universal, culturally-dominant motherhood perceptions that they represent (e.g., "mothers are all-giving") (Arendell, 2000; Hays, 1996; Thurer, 1994) to serve existential anxiety buffering functions. We use the term *symbolic motherhood* to refer to the dominant cultural beliefs and worldviews that are assigned to symbols of motherhood.

According to Terror Management Theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986), adherence to cultural worldviews is a vital mechanism through which humans manage the awareness of mortality, the associated existential anxiety, and the ever-looming possibility that a mortal life is ultimately devoid of any enduring value.

Cultural worldviews, and with it its symbols, function to manage these existential concerns via the provision of clearly defined and lasting belief systems that offer the promise of immortality. In other words, when faced with the finitude of life, people can use their symbolic capacities to maintain psychological equilibrium. Because symbols of motherhood are fundamental to the cultural world, it follows that the re-affirmation of these symbols (and the long-lasting culture they are a part of) is one way through which people can obtain a sense of continued existence beyond space and time after being reminded of their mortal nature. In addition, symbols of motherhood may activate a range of other psychological solutions to the problem of death that similarly involve the activation, or "use", of the symbolic self (Wisman, 2006). In this way, the re-affirmation of symbols of motherhood can potentially operate as a part of humans' psychological immune system in face of existential threats (Wisman & Goldenberg, 2005). Nonetheless, symbols of motherhood differ in the extent to which they involve the physical human body (e.g., pregnancy vs. Mother's Day card). From a TMT perspective, the human body poses an existential problem because it reminds people of their animal nature and that like all animals, humans are vulnerable to death (Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000). Accordingly, it is possible that the physical body in some symbols of motherhood can be a barrier to the accessibility of symbolic solutions in the face of death. In this article, we examine the existential anxiety buffering functions of symbols of motherhood (and boundary conditions of the symbolic properties of realistic representations of motherhood) in three studies that utilize a TMT paradigm.

Symbolic Motherhood in Past and Present

The symbol of motherhood in today's society can be viewed as informed by three historical maternal representations: The Great Mother, Virgin Mary, and the Maternal Instinct. The Great Mother has been the governing motherhood representation from the

Paleolithic period to approximately A.D. 500 (Thurer, 1994) and had a dual nature represented by positive functions (e.g., nourishment, love provision) that existed alongside negative ones (e.g., deprivation, love withdrawal) (Neumann, 1955; Thurer, 1994). From the middle ages to the Modern Period, the Virgin Mary served as the ultimate motherhood representation (Thurer, 1994; Warner, 1976). Mary's image underwent a gradual humanization and domestication process, replacing her divine (e.g., protection, forgiveness) qualities with a culturally-prescribed portrayal of a nurturing, self-sacrificing presider of the home environment (Boss, 2000; Thurer, 1994; Warner, 1976). This association between mothers and the domestic sphere persisted to our time, for example, in the depiction of mothers in magazines (Johnston & Swanson, 2003).

The Maternal Instinct account posits that women have a natural mothering instinct and are biologically geared to care for their children. This account has been central to symbolic motherhood from the 18th century to our time (Badinter, 2011; Gotlib, 2016; Hrdy, 2000; Martucci, 2015) and underlies contemporary motherhood ideologies such as *Intensive Mothering* (Hays, 1996) and the *New Momism* (Douglas & Michaels, 2005) which advocate extreme dedication to childrearing as fundamental to 'good' mothering. Nonetheless, multiple alternative accounts of maternal devotions have been postulated (Badinter, 1982; Chodorow, 1978; Hrdy, 2000; Kristeva, 2005) and evidence in opposition of an innate nurturing drive is considerable, including: the high prevalence of wet nursing across times and cultures; the opting-out of women from motherhood (Badinter, 2011); and mothers' expressions of regretting, not naturally embracing, and struggling with motherhood (Donath, 2015; Read, Crockett, & Mason, 2012).

Symbolic motherhood in today's society shapes and is reflected in various cultural scripts, ideologies, and policies. In everyday life, symbolic motherhood affects

families' daily routines, assigning gender-specific activities (e.g., childrearing activities for mothers) and locations (Dillaway & Paré, 2008). In workplaces, mothers earn lower wages (Gough & Noonan, 2013) and are more heavily penalized in terms of starting salary, perceived competence, and likeability (Benard & Correll, 2010; Correll & Benard, 2007). Such motherhood penalties may reflect unsupportive governmental policies towards mothers' employment. For example, it has been found that mothers (in comparison to non-mothers) pay greater labour market penalties (e.g., lower wages, lower job tenure, increased likelihood of working part-time) in countries that offer little policy support of maternal employment such as the UK (Gash, 2009). Furthermore, symbolic motherhood is related to national childcare policies (Phoenix & Woollett, 1991). In the US, for example, where public policy has over time opted for educating mothers on how to become caregiving experts instead of endorsing state-funded childcare (Vandenberg-Daves, 2014), symbolic motherhood serves to reduce state childcare costs (Douglas & Michaels, 2005).

As reviewed above, symbolic motherhood in today's society integrates characteristics of the Great Mother (e.g., adoration of reproductive abilities; Gotlib, 2016), qualities attributed to the Virgin Mary (e.g., protection, self-sacrifice), and notions of the maternal instinct (e.g., in childcare agendas). These different attributes are represented in symbols of motherhood such as breastfeeding, birth, and pregnancy, whose cultural and societal impact has been significant from the Paleolithic period to these days.

Terror Management Theory

Terror Management Theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) is an influential psychological theory that focuses on existential death anxiety and the cultural mechanisms that can alleviate it. Based on the works of Becker (1971, 1973) and Rank

(1941), TMT proposes that people's awareness of their own inevitable death is a fundamental motivator of human behavior. According to TMT, humans are confronted with a unique existential conflict. On the one hand, they are driven by a self-preservation instinct to secure their existence. On the other hand, due to their developed intellectual abilities, they are unique in understanding their finite existence. This conflict creates the potential for experiencing paralyzing anxiety, or *terror*, which is managed by investing in two interrelated structures that are a part of a symbolic system of psychological defense. One structure is cultural worldviews: a set of beliefs and concepts to which an individual prescribes that are socially constructed and validated. These provide meaning, a set of standards for understanding what is valuable, and the promise of either literal (i.e., promise of an after-life) or symbolic immortality for individuals who are valued by society. The second structure is self-esteem. From a TMT perspective, self-esteem is achieved by meeting the standards of value prescribed by cultural worldviews or by behaving in culturally valued manner. Through living up to the standards of society one consequently gains the protection from mortality offered by the culture (Solomon, Greenberg, & Pyszczynski, 2004). Since its emergence, TMT has gained international empirical support from hundreds of studies (Burke, Martens, & Faucher, 2010; Pyszczynski, Solomon, & Greenberg, 2015).

One main TMT hypothesis is the Mortality Salience (MS) hypothesis (Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989), which posits that when people become aware of their mortality, they have an increased need for symbolic protection. Because cultural worldviews and self-esteem buffer mortality concerns, people would be motivated to defend and uphold their worldviews and to enhance their self-esteem when death is salient. The MS hypothesis has received wide empirical support (for reviews, see Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004; Pyszczynski, Greenberg,

Solomon, & Koole, 2010). For example, when reminded of their mortality, people invest in culturally-valued symbols by defending one's country (Greenberg et al., 1990), Western culture (Norenzayan, Dar-Nimrod, Hansen, & Proulx, 2009), national auto companies (Nelson, Moore, Olivetti, & Scott, 1997), endorsing elements of one's culture (e.g., national soccer team) over foreign ones (Jonas, Fritsche, & Greenberg, 2005), and showing increased reluctance to inappropriately use cultural objects (Greenberg, Porteus, Simon, Pyszczynski, & Solomon, 1995)

Symbols of Motherhood: An Existential Perspective

The female body has been discussed by scholars as containing both life and death (Braidotti, 1994; Goldenberg & Roberts, 2010; Kristeva, 1982). From a TMT perspective, because symbols of motherhood have been a stable cultural pillar throughout the history of mankind they can have existential anxiety buffering functions (Greenberg, Pyszczynski, & Solomon, 1986). According to this perspective, reminders of one's finite nature activate a psychological immune system that helps to maintain a sense of continued existence by symbolic means (Wisman & Goldenberg, 2005).

Because symbolic motherhood is a multi-facet structure, symbols of motherhood may simultaneously activate various psychological solutions to the problem of death that ultimately serve to reaffirm the continued symbolic existence of self after death (Wisman, 2006). These include the validation of the defining properties of symbols of motherhood, for example, maternal love and maternal protection (Thurer, 1994). In a similar vein, it is possible that symbols of motherhood enable the attainment of symbolic proximity to care figures (Hart, Shaver, & Goldenberg, 2005) by activating attachment security (see Mikulincer & Shaver, 2007, 2012), activate a desire to maintain close relationships (Mikulincer, Florian, & Hirschberger, 2003), or thoughts of one's parent (Cox et al., 2008). Furthermore, an essential property of symbols of motherhood is the

capacity to give life (Thurer, 1994). Because symbolic motherhood is intrinsically related to intergenerational continuity, it may provide humans with a sense of immortality (Kristeva, 1987). This notion is consistent with evidence on the existential anxiety buffering properties of the desire for children (Fritsche et al., 2007; Wisman & Goldenberg, 2005), to name children after one's self (Vicary, 2011), parenthood (Yaakobi, Mikulincer, & Shaver, 2014), and babies (Zhou, Lei, Marley, & Chen, 2009). In line with this, it has been suggested that the potential of women's bodies to create life can offer a solution to the problem of death (Goldenberg & Roberts, 2010). Symbols of motherhood may also enable a continued sense of the self by activating hope (Vicary, 2011), a general belief and feeling that desirable outcomes will occur in the future (Wisman & Heflick, 2016). In addition, because symbols of motherhood are a part of a system of culturally-valued standards that confer meaning (e.g., parenthood; Nelson, Kushlev, English, Dunn, & Lyubomirsky, 2013), it is feasible that symbols of motherhood contribute to a sense of a meaningful (long-lasting) existence. Thus, symbols of motherhood may activate a range of symbolic solutions after death reminders, all of which potentially leading to a sense of continued existence of an aspect of the self. In our view, it is exactly this wide range of symbolic solutions that ultimately compose the existential buffer of symbols of motherhood.

Symbols of motherhood appear in abstract and realistic representations. In abstract representations, symbols of motherhood do not involve the physical human body yet may involve graphic representations of it (e.g., a graphic icon of pregnancy, a drawing of the Virgin Mary). In realistic representations, symbols of motherhood are integrated into and are an inseparable part of the physical body of women in real life (e.g., a pregnant woman). While both abstract and realistic representations of symbols of motherhood can potentially serve existential anxiety buffering functions by contributing

to a sense of continued (symbolic) existence, the physicality of the human body in realistic representations can be existentially threatening (Goldenberg et al., 2000) and therefore obstruct the accessibility of symbolic solutions after death reminders.

When humans think about the reproductive physical aspects of women's bodies, they are being reminded of their ultimate physical demise and mortal nature and consequently attempt to distance themselves from the awareness of their physicality (Goldenberg, 2013; Goldenberg et al., 2000; Goldenberg & Roberts, 2004; Morris, Goldenberg, & Heflick, 2014). For example, it has been found that reading an essay that highlighted the biological similarities between humans and animals (i.e., served as a reminder of humans' physical nature) increased negativity towards images of women breastfeeding (Cox, Goldenberg, Arndt, & Pyszczynski, 2007) and pregnant women (Goldenberg, Goplen, Cox, & Arndt, 2007). Moreover, women's bodies can be existentially threatening due their potential to inspire (physical) lust in men (Landau et al., 2006; Morris & Goldenberg, 2015). Indeed, women and their physiology are associated with nature, more so than men (Ortner, 1972; Reynolds & Haslam, 2011). Thus, realistic representations of symbols of motherhood can activate thoughts of the physical aspects of the female body and thus be existentially threatening (Goldenberg et al., 2000).

Realistic representations of symbols of motherhood are ambivalently evaluated in different contexts (Goldenberg, Roberts, Morris, & Cooper, 2013). In some cases, the symbolic meanings of motherhood correspond to idealized maternal stereotypes. In other cases, realistic representations of symbols of motherhood activate negative perceptions and behaviors. Pregnant women, for example, are semantically associated with a host of positive symbolic motherhood attitudes such as warm, unselfish, and beautiful (Chrisler, Gorman, Marván, & Johnston-Robledo, 2014; Marván, Islas, Vela, Chrisler, & Warren,

2008). In contrast, exposure to (staged or actual) pregnancy has been associated with social avoidance (Taylor & Langer, 1977) and negative personality and performance evaluations of job applicants in what has been termed "pregnancy bias" (Halpert, Wilson, & Hickman, 1993). Along similar lines, breastfeeding is associated with 'good' motherhood and multiple benefits in educational health literature (Wall, 2001) and breastfeeding women are perceived in more positive maternal attributes (e.g., concerned mother) in comparison to bottle-feeding women (Forbes, Adams-Curtis, Hamm, & White, 2003). Nevertheless, exposure to breastfeeding either in public or online is highly controversial (Morris, Zaraté de la Fuente, Williams, & Hirst, 2016; Sweney, 2008). For example, people express disgust at breastfeeding exposure due to the sight of bodily fluids and liken this exposure to witnessing other bodily functions (e.g., excreting) (Morris et al., 2016).

The Present Studies

Motherhood is a fundamental cultural symbol that may serve existential anxiety buffering functions via the reaffirmation of symbols of motherhood and the symbolic properties they represent. However, these functions may be limited in realistic representations of symbols of motherhood that activate the physical aspects of motherhood. When death is salient, reminders of the human body can be nonthreatening when linked to their symbolic meanings (Goldenberg, Cox, Pyszczynski, Greenberg, & Solomon, 2002). In three studies, we examined the hypothesis that symbols of motherhood can serve existential anxiety buffering functions, but only when they do not expose the physicality of the female body. In Study 1, we examined the impact of exposure to an abstract sketched symbol of motherhood in comparison to a control prime on implicit self-esteem levels when death is salient. In Study 2, we examined the impact of exposure to realistic representations of symbols of motherhood after death reminders.

Finally, in Study 3, we investigated the effects of exposure to realistic pictures of symbols of motherhood that do not (versus do) show the physicality of the female body after death reminders on implicit self-esteem levels.

Study 1

In Study 1, we focused on the anxiety buffering effects of symbolic motherhood after death reminders in the domain of implicit self-esteem. Implicit self-esteem has been defined as an unconscious self-evaluation that emerges through automatic associations between self- and positive/negative concepts in one's memory (Falk & Heine, 2015) and has been associated with positive experiences of maternal nurturance and attuned protection (DeHart, Pelham, & Tennen, 2006). Because mortality salience is managed outside conscious awareness (Greenberg, Arndt, Simon, Pyszczynski, & Solomon, 2000), implicit self-esteem levels may be particularly affected in the management of death awareness (Hetts & Pelham, 2001; Schmeichel et al., 2009). Indeed, previous research has shown that people's implicit self-evaluations may be activated in the absence of purposeful self-reflection (Koole, Dijksterhuis, & Van Knippenberg, 2001). For instance, TMT research has shown that a (romantic or parental) relationship prime after MS increased implicit self-esteem levels (Cox et al., 2008) and that high levels of trait or manipulated implicit self-esteem are associated with decreased worldview defense after death reminders (Schmeichel et al., 2009). Evidence on changes in explicit self-esteem following reminders of death is limited (Lambert et al., 2014; Pyszczynski et al., 2004) and recent findings suggest that changes in explicit self-esteem after MS depend on controlling for changes in affect (Lambert et al., 2014).

From a TMT perspective (Greenberg et al., 1986), if symbolic motherhood is a cultural pillar, then its affirmation should validate cultural worldviews of motherhood and in turn boost people's self-value after reminders of death. Accordingly, we reasoned

that exposure to an abstract symbolic motherhood prime would serve to buffer against reminders of mortality, which in turn should increase implicit evaluations of self-worth. Specifically, we hypothesized that exposure to a prime of an abstract symbol of motherhood, but not a control prime, after death reminders would increase levels of implicit self-esteem. In order to explore the role of affect in these effects, we evaluated affect and mood after study manipulations. Because symbols of motherhood may also enable a continued sense of the self by activating hope (Wisman & Heflick, 2016) it is possible that exposure to symbols of motherhood after death reminders would increase hope. To examine this, we included a measure of implicit hope (Wisman & Heflick, 2016).

Method

Participants and Recruitment

Participants were 149 users (43% female) of crowdsourcing platform Prolific aged 18-30 (M_{age} = 24.00, SD_{age} = 2.95) of diverse nationalities who received €0.85 for their participation. Prolific is a crowdsourcing platform through which participants can complete online studies and receive financial compensation in return. In studies 1-3 reported in this paper, sample size was determined using an a-priori power analysis (on G*Power 3.1.9.2) to exceed the number of participants needed obtain an effect size of f = .40 using $\alpha = .05$, and childlessness and being between 18-30 years of age were inclusion criteria. These inclusion criteria were set because parenthood is associated with more realistic (and less symbolic) perceptions of motherhood (Miller, 2007; Steen, Downe, Bamford, & Edozien, 2012) and younger age is associated with more idealized perceptions of motherhood (e.g., "The reward for a mother is knowing that she has done her duty"; Hare-Mustin & Broderick, 1979). Two participants who did not pass an attention check and four participants who identified the purpose of the prime

manipulation were excluded from analysis. In addition, one participant showed extreme response bias and was excluded from analysis. Importantly, this exclusion did not affect the significance of the main findings. We report all data exclusions in studies 1-3 in accordance with APA standards and at no point were additional data collected after data were initially analyzed.

Procedure and Materials

This online study had a 2 (mortality salience: high, low) X 2 (prime: symbolic motherhood, control) between-participants design. Participants first completed the 10-item Rosenberg Self Esteem Scale (Rosenberg, 1965), followed by three filler items on the frequency of leisure activities (i.e., "How often do you participate in the following activities? Engaging in hobbies, going on walks, visiting friends). Next, participants were randomly allocated to the MS condition or the control condition. In the MS condition, participants completed two open-ended items: "Briefly describe the emotions that the thought of your own death arouses in you." and "Jot down, as specifically as you can, what you think will happen to you physically as you die and once you are physically dead." (Rosenblatt et al., 1989). Control participants completed two parallel items on watching television. Participants then completed the 20-item Positive and Negative Affect Scales (PANAS; Watson, Clark, & Tellegen, 1988). Items were rated on a scale ranging from 1 (very slightly or not at all) to 5 (extremely). A total score was computed for positive affect (10 items; $\alpha = .91$) and negative affect (10 items; $\alpha = .89$) as the mean of items' ratings. The PANAS served as a delay and distraction task because research have shown that MS effects are manifested when primed death thoughts are outside of consciousness and no longer attended to (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994).

Next, participants were randomly allocated to either a symbolic motherhood prime or a control prime manipulation. Participants in the symbolic motherhood condition were presented with an image of a woman holding a baby to her chest (see Mikulincer, Hirschberger, Nachmias, & Gillath, 2001 for similar procedures). This image did not expose the physicality of the female body (i.e., the only visible body parts of the woman are head and arm). Control participants were presented with an image of a young woman with headphones. Both images were drawn in the same style and technique (i.e., blue line drawings on a clear background) by the same stock photo artist (Zhanna Millionnaya at dreamstime.com; image IDs: 41574283, 26518857) and presented in equal size measurements. To obscure the purpose of the prime, participants in both conditions were asked to browse the image in search for hidden shapes that become visible when scrolled over by the mouse cursor and to click to highlight them. Participants were instructed that they could take as long as they need to detect as many shapes as possible (28 shapes composed each image).

Following the prime manipulation, participants completed one item on *positive mood* and one item on *negative mood* (i.e., "How positive/negative do you feel right now?") rated on a scale ranging from 1 (more positive/negative than usual) to 9 (less positive/negative than usual). The positive mood item was reversed so that a high score represented high levels of positive mood. Next, participants completed a measure of *implicit hope* developed for this study based on previous measures using ambiguous word stimuli (Tesser & Cowan, 1977). Its instructions stated that we are interested in people's intuitive interpretations of words in different languages and that participants will be briefly presented with six words and asked to what extent each word conveys hope. It was highlighted that responses should be quick and that there are no right or wrong answers. Each word was presented for three seconds and followed by a single

item assessing implicit hope (i.e., "This word conveys hope") rated on a scale of 1 (not at all) to 10 (very much so). The meaning of all six words was "elevator" in different languages (e.g., Maori). An index score was computed as the mean of the six ratings. Next, participants completed a single item evaluating *implicit self-esteem*: "How much do you like your name, in total?" on a scale of 1 (not at all) to 9 (very much) (Gebauer, Riketta, Broemer, & Maio, 2008).[1] Finally, participants were asked what in their opinion the purpose of the study and of the visual perception task was, provided demographic details, and were thanked and debriefed.

Results

Sample size per cell is presented in Table 1.

Table 1. Sample size per cell (Study 1)

	Symbolic motherhood prime	
	High	Low
Mortality salience		
High	35	37
Low	37	40

MS, Affect, and Mood

ANOVA analysis showed no significant effects of MS condition on positive affect or negative affect, both *p*s > .30. Positive mood, but not negative mood, was significantly predicted by the interaction between MS condition and prime, F (1, 145) = 9.15, $p = .003$. MS participants that were presented with the control prime showed significantly higher levels of positive mood (M = 5.78, SD = 1.94) in comparison to MS participants who

[1] Participants then completed a death thought accessibility measure based on Arndt et al. (1997) (See Appendix 2) that was not included in the main analysis.

were presented with the symbolic motherhood prime (M = 4.63, SD = 2.14), F (1, 145) = 6.71, *p* = .011, and in comparison to control participants who were presented with the control prime (M = 4.90, SD = 1.66), F (1, 145) = 4.20, *p* = .042. While both primes led to positive mood evaluations after MS, pleasant facial features in the control (but not in the symbolic motherhood) prime may have led to higher levels of positive mood. Among those who viewed the symbolic motherhood prime, MS participants showed significantly lower levels of positive mood (M = 4.63, SD = 2.14) in comparison to control participants (M = 5.62, SD =1.82), F (1, 145) = 4.20, *p* = .028. To rule out the possibility that our effects are due to mood, we included positive mood as a covariate in subsequent analyses.

MS, Prime, and Hope

To examine the effect of MS and symbolic motherhood prime on implicit hope, we conducted an ANCOVA with MS and prime as the independent variables, positive mood as a covariate, and implicit hope as the dependent variable. There were no significant main or interaction effects, all *p*s > .39.

Main Analysis

MS, Exposure to a Symbol of Motherhood, and Implicit Self-Esteem

To examine the effect of MS and symbolic motherhood prime on implicit self-esteem, we conducted the above analysis with implicit self-esteem as the dependent variable.[2] There were no significant main effects for MS or prime, both *p*s > .24, and positive mood significantly increased implicit self-esteem, F (1, 144) = 12.64, *p* = .001, $\eta^2_p = 0.08$. The interaction between MS and prime was statistically significant, F (1, 144) = 4.20, *p* = .042, $\eta^2_p = 0.03$ (Figure 1). Simple effects analyses showed that among participants in the

[2] To explore the role of gender in our effects, we ran the main analyses with gender as a covariate. Adding gender as a covariate did not reduce the level of significance of the main findings in studies 1-3.

MS condition, those primed with symbolic motherhood had significantly higher levels of implicit self-esteem (Estimated Marginal Means (EMM) = 7.70, Standard Error (SE) = 0.28) in comparison to those who were shown the control image (EMM = 6.83, SE = 0.27), F (1, 144) = 5.00, $p = .029$, $\eta^2_p = 0.03$. Among those in the control condition, the prime condition did not affect implicit self-esteem levels, $p > .48$. Thus, as hypothesized, priming symbolic motherhood after MS was associated with significantly increased levels of implicit self-esteem in comparison to controls. Looked at differently, among those primed with symbolic motherhood, MS participants had significantly higher levels of implicit self-esteem (EMM = 7.70, SE = 0.28) in comparison to control participants (EMM = 6.82, SE = 0.27), F (1, 144) = 5.04, $p = .026$, $\eta^2_p = 0.03$. Among those who were shown the control prime, MS condition did not affect implicit self-esteem levels, $p > .50$. In other words, exposure to symbolic motherhood, but not a control prime, increased levels of implicit self-esteem after MS.

Discussion

In Study 1, we examined the existential anxiety buffering functions of exposure to an abstract symbol of motherhood after reminders of death. As hypothesized, after MS, participants who were primed with a symbol of motherhood showed increased implicit self-esteem levels in comparison to controls. This study provided evidence that after death reminders, exposure to a symbol of motherhood that is not realistic (i.e., sketch) increases people's implicit self-esteem levels. The symbol presented did not exhibit the physicality of the female body, however, it is unclear if this lack of physicality affected the findings. In studies 2-3, we turned our attention to realistic pictures of symbols of motherhood. In Study 2, we examined the impact of exposure to symbols of motherhood in realistic pictures of breastfeeding and birthing women after death reminders.

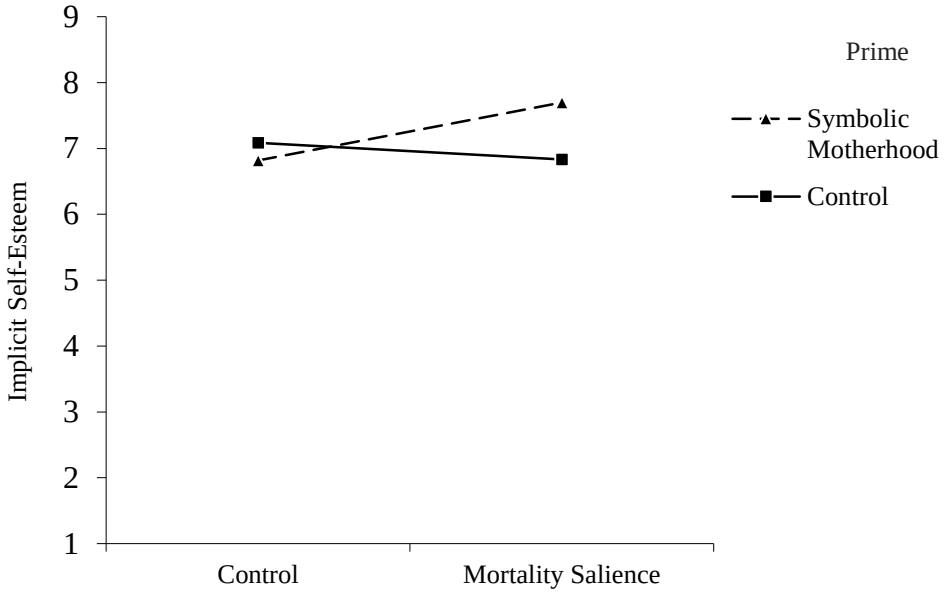

Figure 1. The interaction between mortality salience and symbolic motherhood prime on implicit self-esteem (Study 1)

Study 2

In Study 1, exposure to a sketched icon of a symbol of motherhood increased implicit self-esteem after death reminders. These findings show that exposure to an abstract symbol of motherhood after death reminders can serve anxiety buffering functions. However, it is yet unclear if realistic symbols of motherhood, which involve the physical human body and can therefore be existentially threatening (Cox et al., 2007; Goldenberg et al., 2007; Morris et al., 2014) at the same time as being a part of a system of culturally-valued standards, can serve existential anxiety buffering functions. In the following studies, in order to examine this possibility, we focused on symbols of motherhood (i.e., breastfeeding, birth, and pregnancy) in realistic portrayals of women. Building on the findings of Study 1, we first examined if symbolic motherhood properties can become accessible following exposure to realistic pictures of symbols of motherhood (i.e., breastfeeding, birth) and death reminders. We reasoned that if the symbolic motherhood properties of realistic pictures of symbols of motherhood are accessible after MS, this

would lead to increased evaluations of these properties. On the other hand, if the physical, existentially threatening properties of these realistic pictures (e.g., bodily products/exposure) are accessible after MS, this would lead to increased disgust (Goldenberg et al., 2001). This hypothesis is based on evidence that disgust can serve as a symbolic defense mechanism (Goldenberg et al., 2001) through which humans distance themselves from perceived similarity to animals (see Goldenberg et al., 2000).

Method

Participants and Recruitment

Participants were 155 users (40% female) of crowdsourcing platform Prolific aged 18-29 (M_{age} = 23.30, SD_{age} = 3.20) who were mostly (97%) US nationals. In exchange for taking part, participants received €1.6. One participant who identified the link between the death manipulation and motherhood prime was excluded from analysis. In addition, three participants showed response bias and were excluded from analysis. Importantly, this exclusion did not affect the significance of the main findings.

Procedure and Materials

This online study had 2 groups (mortality salience: high, low) in a between-participants design. Participants completed the 10-item Rosenberg Self Esteem Scale (Rosenberg, 1965), followed by the 8-item neuroticism subscale of the Big Five Inventory (Benet-Martinez & John, 1998),[3] and three filler items on the frequency of leisure activities (see Study 1). Next, participants were randomly allocated to the MS condition (see Study 1)(Rosenblatt et al., 1989) or a public speaking control condition (Greenberg et al., 1994). Participants then completed the PANAS (Watson et al., 1988; positive affect: α = .89, negative affect: α = .91) followed by a wordsearch puzzle to create a delay and distraction before the next part of the study (Greenberg et al., 1994). In the next section,

[3] These self-esteem and neuroticism measures were assessed for exploratory purposes and were not used in our analysis.

participants were instructed that they would be presented with different pictures and subsequently asked for their perceptions of it. It was highlighted that participants should respond intuitively and that there are no "right" or "wrong" answers. Participants were exposed to six realistic pictures of symbols of motherhood (i.e., birth, breastfeeding). For example, a birthing woman holding her newborn, attached by the umbilical cord. After each picture participants were asked to evaluate to what extent the picture evoked feelings of disgust (three items; "This picture is disgusting/is repulsive/evokes nausea"; α = .95) or symbolic motherhood (three items; "This picture illustrates the love of a mother/displays a mother's affectionate care/evokes a sense of meaning; α = .94) on a 1 (strongly disagree) to 7 (strongly agree) scale. A total "disgust" score was computed as the mean of ratings across pictures so that a higher score indicates higher levels of disgust. A total "symbolic motherhood" score was computed in the same way.[4] Finally, participants were asked what in their opinion the purpose of the study, completed demographic information, and were thanked and debriefed.

Results

MS and Affect

ANOVA analysis showed no significant effects of condition on positive affect, $p > .49$, and a marginally significant increase in negative affect after MS, $p = .077$. To rule out the possibility that our findings are due to changes in negative affect, we re-ran the main analyses with negative affect as a covariate. The significance levels of the MS effects were not affected.

Main Analysis

Evaluation of the Realistic Pictures of Symbols of Motherhood

[4] Participants then completed a death/fear/disgust thought accessibility measure based on Arndt et al. (1997) (See Appendix 2) and one item evaluating implicit self-esteem (Gebauer et al., 2008). These two measures were not included in the main analysis.

To examine the relation between MS and disgusting aspects of realistic pictures of symbols of motherhood, we conducted an ANOVA with condition as the independent variable and the total disgust score as the dependent variable. Participants in the MS condition (n = 79) evaluated the realistic primes as significantly higher on "disgust" (M = 2.05, SD = 1.13) in comparison to those in the control condition (n = 76; M= 1.67, SD = 0.87), F (1,153) = 5.60, p = .019, η^2_p = .035. The realistic primes of symbols of motherhood were not evaluated as higher on "symbolic motherhood" after MS, p > .47.

Discussion

In Study 2, we examined the impact of exposure to realistic pictures of symbols of motherhood after death reminders. It was found that reminders of death and exposure to realistic pictures of symbols of motherhood increased levels of disgust. These findings corroborate evidence on the existentially threatening properties of exposure to realistic symbols of motherhood in pictures of women after death reminders (Cox et al., 2007; Goldenberg et al., 2007; Morris et al., 2014) and extend exposure outcomes to include disgust. In the current study, death reminders did not increase participants' evaluations of the symbolic properties of symbols of motherhood in realistic pictures. These findings suggest that after MS, the physical, existentially threatening properties of realistic pictures of symbols of motherhood are accessible while symbolic motherhood properties are not. It is possible that the particular graphic nature of the set of pictures (e.g., breast exposure, umbilical cord) that constructed our dependent variable decreased the existential anxiety buffering properties of symbols of motherhood. Indeed, it has been found that exposure to highly graphic pictures of the human body leads to a robust disgust response that may override defensive existential cues (Cox et al., 2007). Accordingly, we reasoned that exposure to realistic pictures of symbols of motherhood

(e.g., pregnancy) would serve defensive existential functions only when these pictures do not expose the physicality of the female body. We examined this hypothesis in Study 3.

Study 3

While pregnancy exposure can comprise an existential threat (Goldenberg et al., 2007; Morris et al., 2014), pregnancy representations differ on level of bodily exposure and may exclude the display of (existentially threatening) bodily fluids or products. Building the findings of Study 2, we reasoned that exposure to a realistic picture of a symbol of motherhood (i.e., pregnancy) that does not show the female body (or its products) would activate thoughts of symbolic motherhood and would not activate thoughts of the physicality of female body. These predictions were confirmed in a pilot study. Specifically, 66 Mturk participants were asked to rate one randomly presented picture, either a picture of a woman in late pregnancy in which the pregnant belly was not exposed (n = 33) or a picture of the same women in the same stage of pregnancy in which the pregnant belly was exposed and showing the physical marks of pregnancy (e.g., stretch marks, veins) (n = 33). The picture of the pregnant woman with her belly covered was rated significantly higher on symbolic motherhood ("To me, this picture shows the beauty of pregnancy") (M = 6.88, SD = 1.87) in comparison to the picture of the pregnant woman with her belly exposed (M = 4.27, SD = 2.51), $t(64) = 4.78$, $p <$ .001, and significantly lower on feelings of disgust ("To me, this picture is disgusting") (M = 2.27, SD = 2.25) in comparison to the picture of the pregnant woman with her belly exposed (M = 4.42, SD = 2.57), $t(64) = -3.61$, $p = .001$, on a 1 (strongly disagree) to 9 (strongly agree) scale. This evidence shows that the picture of the pregnant woman with her belly covered had symbolic motherhood properties and was low on activating thoughts of the physicality of the female body.

Based on the pilot findings and in line with the findings of Study 1, we hypothesized that exposure to realistic pictures of pregnant women that do not expose (versus expose) the physicality of the female body after death reminders would increase people's implicit self-esteem levels. In other words, in Study 3, we directly tested our main hypothesis by manipulating exposure to symbols of motherhood that differ in the extent to which they expose female body physicality. As discussed in the Introduction, realistic representations of symbols of motherhood can be existentially threatening (via activating thoughts of the physicality of the female body) (Goldenberg et al., 2000) and at the same time may serve existential anxiety buffering functions (by securing a sense of a continued symbolic existence). In support of this notion, we have provided evidence that exposure to symbols of motherhood can promote both positive self-evaluations (Study 1) and negative emotions (Study 2). To directly examine if people respond to realistic representations of symbols of motherhood in a dual (i.e., both positive and negative) manner, we included a measure of mixed emotions after the symbolic motherhood prime and hypothesized that exposure to a pregnancy picture that exposes the physicality of the female body would increase the experience of mixed emotions. Finally, symbols of motherhood may activate a sense of a meaningful existence after death reminders. In line with this, we examined the possibility that exposure to a symbol of motherhood would increase people's experience of meaning in life after MS.

Method

Participants and Recruitment

Participants were 207 users (52% female) of crowdsourcing platform Amazon Mturk aged 18-30 (M_{age} = 26.95, SD_{age} = 2.65) who were mostly (97%) US nationals and received 1$ for their participation. Two participants who identified the link between the death manipulation and motherhood prime were excluded from analysis. In addition, two

participants showed extreme response bias and were excluded from analysis. Importantly, this exclusion did not reduce the significance of the main findings.

Procedure and Materials

This online study had 2 (mortality salience: high, low) X 2 (symbolic motherhood prime: high, low) between-participants design. Participants first completed the 10-item Rosenberg Self Esteem Scale (Rosenberg, 1965), and the 8-item neuroticism subscale of the Big Five Inventory (Benet-Martinez & John, 1998).[5] In addition, participants completed three filler items on the frequency of leisure activities (see Study 1). Next, participants were randomly allocated to the MS condition (see Study 1)(Rosenblatt et al., 1989) or a public speaking control condition (Greenberg et al., 1994). Participants then completed the PANAS (Watson et al., 1988; positive affect: $\alpha = .93$, negative affect: $\alpha = .92$) which served as a delay and distraction task (Greenberg et al., 1994). Next, participants were randomly allocated to a symbolic motherhood prime condition, in which they were presented with the same task instructions as in Study 2 followed by one of the two piloted pictures. Those in the high symbolic motherhood condition were presented with a picture of a pregnant woman in which the pregnant belly was not exposed. Those in the low symbolic motherhood condition were presented with a picture of the same women in the same stage of pregnancy in which the pregnant belly was exposed and showing the physical marks of pregnancy. Both pictures showed the woman from head to thigh and were in equal size measurements. Next, participants completed assessments of mixed emotions and mood. Drawing on previous measures (Berrios, Totterdell, & Kellett, 2015), *mixed emotions* were evaluated by two items ("When viewing the picture, I felt mixed emotions"; "Right now, I'm feeling contrasting emotions"; $\alpha = .92$) rated on a 1 (not at all) to 5 (very much) scale, and a mean index

[5] These self-esteem and neuroticism measures were assessed for exploratory purposes and were not used in our analysis.

score was computed. *Positive mood* and *negative mood* were assessed as in Study 1. Participants then proceeded to the ostensible part 2 of the study and completed a measure of *implicit meaning in life* modelled after the implicit hope measure in Study 1. The meaning of all six words presented was "purpose" in different languages. Subsequently, participants completed an item evaluating *implicit self-esteem* (see Study 1)(Gebauer et al., 2008). Finally, participants received a self-esteem boost to counter any discomfort that may have been experienced during the study, were asked what in their opinion was the purpose of the study, provided demographic details, and were thanked and debriefed.

Results

Sample size per cell is presented in Table 2.

Table 2. Sample size per cell (Study 3)

	Symbolic motherhood prime	
	High	Low
Mortality salience		
High	54	49
Low	52	52

MS and affect

ANOVA analysis showed no significant effects of condition on positive or negative affect, both *p*s >.62.

Prime, Mood, and Mixed Emotions

As hypothesized, in an ANOVA analysis, participants who were exposed to a low symbolic motherhood prime showed significantly higher levels of mixed emotions (M = 2.79, SD = 1.36) in comparison to those in the high symbolic motherhood prime condition (M = 2.06, SD = 1.11), F (1, 205) = 18.00, $p < .001$, $\eta^2_p = 0.08$, thus supporting

the validity of the symbolic motherhood primes. Neither positive mood nor negative mood were predicted by the interaction between MS and prime, both *ps* > .60.

MS, Prime, and Meaning in Life

To examine the effect of MS and symbolic motherhood prime on implicit meaning in life, we conducted an ANOVA with MS and prime as the independent variables and meaning in life as the dependent variable. There were no significant main or interaction effects, all *p*s > .40.

Main Analysis

MS, Exposure to a Symbol of Motherhood, and Implicit Self-Esteem

To examine the effect of MS and symbolic motherhood prime on implicit self-esteem, we conducted the above analysis with implicit self-esteem as the dependent variable. There were no significant main effects for MS or prime, both *p*s > .41. The interaction between MS and prime was marginally significant, $F (1, 203) = 3.90$, $p = .050$, $\eta^2_p = 0.02$ (Figure 2). Simple effects analyses showed that among participants in the MS condition, those who were exposed to the high symbolic motherhood prime had higher levels of implicit self-esteem (M = 7.09, SD = 1.93) in comparison to those who were exposed to the low symbolic motherhood prime (M = 6.31, SD = 2.11), $F (1, 203) = 3.86$, $p = .051$. Among those in the control condition, the prime condition did not affect implicit self-esteem levels, $p > .41$. Thus, as hypothesized, exposure to the symbolic motherhood properties of pregnancy after MS was associated with increased levels of implicit self-esteem.

Discussion

In Study 3, we found that exposure to a pregnancy picture with high (versus low) symbolic motherhood properties increased implicit self-esteem after death reminders. These findings are in line with evidence that human body reminders can be nonthreatening when their symbolic properties are highlighted (Goldenberg et al., 2002).

Taken together, the findings of Study 1 and Study 3 show that exposure to symbols of motherhood that do not expose the physicality of the female body can serve anxiety buffering functions after reminders of death.

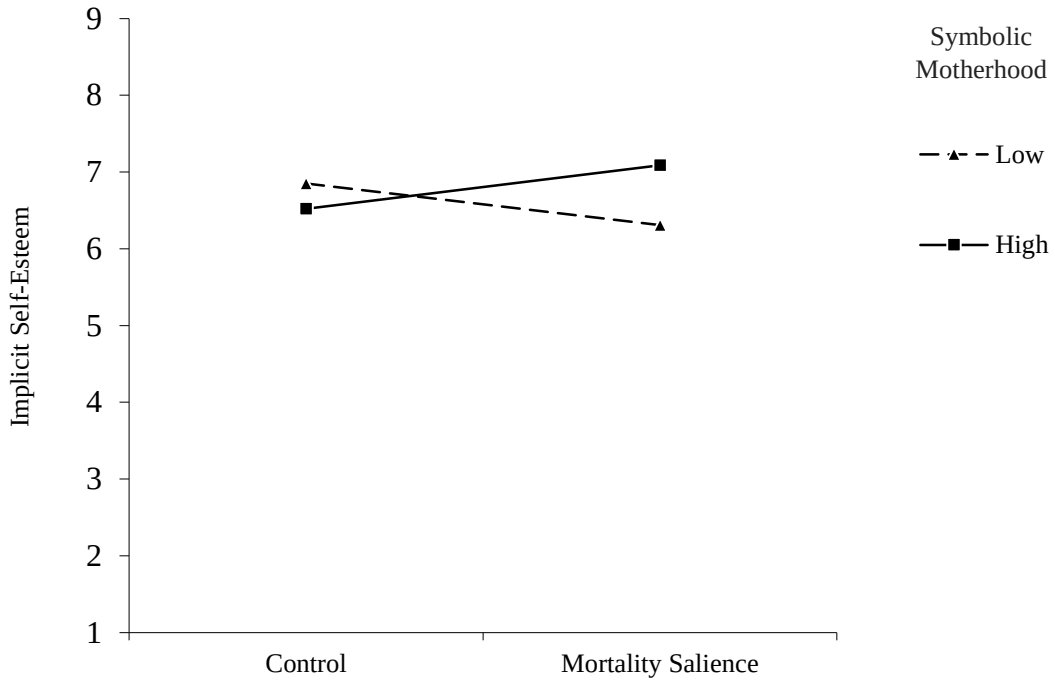

Figure 2. The interaction between mortality salience and symbolic motherhood prime on implicit self-esteem (Study 3)

General Discussion

This paper examined the existential anxiety buffering functions of symbols of motherhood (and boundary conditions of the symbolic properties of realistic representations of motherhood) in three studies. We provided evidence that after reminders of death, exposure to a symbol of motherhood increased implicit self-esteem levels, whether that symbol is abstract (Study 1) or realistic (Study 3). Conversely, exposure to realistic portrayals of women that highlight the physical aspects of the

female body after death reminders elicited higher levels of disgust and did not affect the evaluation of symbolic motherhood properties (Study 2). Overall, we have shown that symbols of motherhood can serve existential anxiety buffering functions but only when they do not exhibit the physicality of the female body in relation to motherhood.

Limitations and Future Directions

The findings reported in this paper represent the first evidence to date that symbols of motherhood can function as an anxiety buffer against existential concerns. Because of the pervasiveness of symbols of motherhood in contemporary society, the potential implications of the current findings for women's wellbeing in various life domains are wide-ranging, as discussed below. Nonetheless, the studies reported in this paper are not without limitations. Although identifying the specific symbolic solutions that are activated by symbols of motherhood after death reminders was not our main interest, the current perspective provided some initial insights into the boundary conditions of symbolic motherhood. Specifically, we have shown that implicit hope levels (Study 1) and implicit meaning in life levels (Study 3) were unchanged after death reminders and exposure to a symbol of motherhood. Of note, it is possible that these results were null because the implicit scales used were not validated. Future research is needed in order to further elucidate which specific elements of symbolic motherhood are activated in response to death reminders. For example, future research could examine the role of attachment security (Mikulincer & Shaver, 2007, 2012) in the existential anxiety buffering effects of symbols of motherhood.

While symbols of motherhood are universal and have common features across cultures (e.g., the promise of new life), the specific meanings attached to some symbols of motherhood are culturally defined (Obermeyer & Castle, 1996). For example, perceptions of breastfeeding vary across cultures (Obermeyer & Castle, 1996) as

reflected in cross-country differences in breastfeeding initiation prevalence (Callen & Pinelli, 2004; Ibanez et al., 2012). In addition, countries vary in their endorsement of traditional notions of symbolic motherhood (Badinter, 2011). For example, differences between UK and Israeli mothers in rates of reporting the difficulties of motherhood have been reported (Shloim et al., 2015). It follows that the capacity of traditional symbols of motherhood to function as existential anxiety buffers may differ in different populations. For example, the existential anxiety buffering functions of symbols of motherhood may be more pronounced in countries that generally endorse traditional notions of symbolic motherhood than in countries that typically do not (Badinter, 2011). Current evidence was obtained in samples of diverse or US nationality, however, further investigation of the cross-cultural generalizability of the findings is warranted. Along similar lines, future research should examine the possibility that different cultural symbols of motherhood can lead to different existential outcomes in men and women.

A potential limitation of our studies is the use of a single item to measure implicit self-esteem. Nonetheless, in previous studies (Gebauer et al., 2008), this measure was found to be valid (e.g., predicted state anxiety), had high test-retest reliability, and showed positive relations with common implicit self-esteem measurements such as the Name-Letter-Task (Kitayama & Rarasawa, 1997) and the Self-Esteem Implicit Association Test (Greenwald & Farnham, 2000). A consistent finding in two studies in this paper is an increase in implicit self-esteem levels following exposure to a single image of a symbol of motherhood after death reminders. The validity of the findings is enhanced by the use of standard neutral and aversive control conditions, different online data pools, and different priming techniques of symbols of motherhood including realistic pictures of motherhood. Of note, the findings of Study 3 are based on a prime presenting a single person. In the future, the use of multiple persons as stimulus materials

is recommended in order to address stimulus sampling concerns and enhance the generalizability of the findings (Judd, Westfall, & Kenny, 2012). All studies were conducted online and therefore the applicability of the findings to real-life medical and work settings is a direction for future research.

Can Symbols of Motherhood Boost Women's Wellbeing?

A significant body of work has been conducted on the existential threat inherent in exposure to the physicality of the female body (Goldenberg, 2013; Goldenberg, Arndt, Hart, & Routledge, 2008; Landau et al., 2006). One research line focused on self-objectification among women as a way to manage existential threat by transforming oneself into an immortal cultural object that is devoid of human characteristics ("I am not human and therefore not mortal") (Goldenberg, 2013; Morris et al., 2014). Complementing this body of evidence, we found that after death reminders, exposure to a realistic picture of a symbol of motherhood (i.e., pregnancy) increased implicit self-esteem levels. Thus, symbols of motherhood and self-objectification can both be utilized to defend against exposure to the physicality of the female body after death reminders. While symbols of motherhood are associated with attributes that involve the rejection of the self (e.g., selflessness, self-sacrifice) they also highlight fundamental human qualities (e.g., love) (Thurer, 1994). In other words, symbols of motherhood do not share with self-objectification the transformation of the self into a dehumanized object.

The current findings suggest that exposure to symbols of motherhood after death reminders can lead to the utilization of self-affirming psychological defence among women including in real-life settings. For example, the increased rates of women opting for caesarean section may be a form of women's self-objectification driven by a desire to manage the mortality salient properties of natural birth (Andrist, 2008; Jolly, 2017). In surgical childbirth, the woman is relegated as an object (of surgery) rather than a subject

(who experiences childbirth in an embodied manner) (Andrist, 2008). Opting for surgical childbirth (and the self-objectification it enables), therefore, could be one means through which women distance themselves from awareness of their physical body when giving birth (Andrist, 2008). Indeed, the findings of Study 2 suggest that much like breastfeeding, pregnant, and menstruating female bodies (Morris et al., 2014), birthing bodies may comprise an existential threat. Future research could seek to establish this and examine if highlighting symbolic motherhood properties (e.g., life-giving) of birth using exposure to symbols of motherhood in health settings (e.g., as an element of interior design, Beukeboom, Langeveld, & Tanja-Dijkstra, 2012) could reduce high-risk delivery decisions among women, for example, in the absence of medical need for caesarean delivery (Fenwick, Staff, Gamble, Creedy, & Bayes, 2010).

The term *benevolent sexism* refers to attitudes that idealize women as the subject of adoration and protection while suggesting that women are weak and should be confined to traditional gender roles (Glick & Fiske, 1996, 2001). Benevolent sexism has been associated with positive trait perceptions (e.g., tender, warm) of women (Glick et al., 2000) and men's stereotypical and symbolic beliefs towards female homemakers (Glick, Diebold, Bailey-Werner, & Zhu, 1997) as well as restrictive and unsupportive attitudes towards women (Huang, Davies, Sibley, & Osborne, 2016; Murphy, Sutton, Douglas, & McClellan, 2011). The clear parallels between benevolently sexist attitudes and symbolic motherhood suggest that symbolic motherhood may impact benevolently sexist perceptions and behaviours towards women (Huang et al., 2016). Indeed, symbolic motherhood has been found to mediate the relationship between sexist beliefs and restrictive attitudes towards women's reproductive rights (Huang et al., 2016) and post-birth employment (Verniers & Vala, 2018).

The current evidence on the anxiety buffering functions of symbols of motherhood suggest that benevolently sexist perceptions and behaviours that re-assert women's traditional roles (i.e., validate symbolic motherhood) may serve to manage existential concerns when death is salient. In other words, the defence of symbolic motherhood after death reminders may manifest in benevolent sexism. Indeed, reminders of death have been found to increase benevolent sexism beliefs (Leka, 2015). Exposure to symbols of motherhood in times of existential threat may thus function to reaffirm cultural worldviews (and alleviate existential concerns), thereby reducing the need to engage in benevolently sexist perceptions and behaviours including in the domains of work (Verniers & Vala, 2018) and sexual harassment (Fraser, 2015). This is an important women's well-being and gender equity objective as seen for example in the popularity of the #MeToo movement (Khomami, 2017). Future investigations on the interaction between death awareness, exposure to symbols of motherhood, and benevolently sexist behaviours are warranted.

A Terror Management Perspective on Reducing Bias Towards Pregnant Women

In the domain of work, pregnant women experience negative bias in hiring endorsement and personal evaluations as applicants and employees (Cunningham & Macan, 2007; Fox & Quinn, 2015; Halpert et al., 1993; Masser, Grass, & Nesic, 2007; Sabat, Lindsey, King, & Jones, 2016). From a TMT perspective, this bias may be underpinned by the existential threat inherent in the pregnant female body (Goldenberg et al., 2007). Specifically, the negative evaluations of pregnant women in work settings may reflect a desire to distance oneself from the awareness of one's physicality (and therefore ultimate mortality) elicited by the pregnant female body (Goldenberg & Roberts, 2004). This account is consistent with current findings that people experience increased feelings of disgust after exposure to death reminders and to realistic pictures of symbols of

motherhood. Indeed, evidence show that exposure to the physicality of pregnancy is associated with unfavourable outcomes in work domains. It has been found that exposure to nine-month pregnancy (i.e., high level of physicality) in job applicants increased the applicant's negative evaluations (Halpert et al., 1993). As employees, women describe how the physicality of their pregnancy has overshadowed their professional value (Millward, 2006). Finally, it has been found that pregnant women who were perceived to conceal their late-stage (but not early-stage) pregnancy were evaluated as less competent by workplace supervisors (Nag, Botsford, Sabat, & Walker, 2016).

According to TMT, cultural beliefs are key to the management of existential concerns (Greenberg et al., 1986). It follows that the reinforcement of cultural worldviews may eliminate the need to manage the awareness of one's (inescapably mortal) physical nature elicited by the pregnant body. In line with this, receiving information that highlights culturally-valued work characteristics (i.e., commitment, flexibility) has been found to reduce negative behaviours towards pregnant job applicants (Morgan, Walker, Hebl, & King, 2013). On a practical level, the above account suggests that pregnant job applicants who highlight their culturally-valued characteristics may reduce biased evaluations by validating interviewers' cultural worldviews. Nonetheless, we do not endorse placing the burden of bias reduction on pregnant women. On an organizational level, reducing bias towards pregnant women could be promoted by adopting standardized recruitment procedures that do not discriminate against pregnant women (e.g., structured interviews) (Bragger, Kutcher, Morgan, & Firth, 2002) and implementing organizational settings that can reduce unconscious bias (Stamarski & Son Hing, 2015).

Conclusions

In three studies, we have presented evidence on the anxiety buffering functions of

symbols of motherhood when death is salient. Overall, this evidence shows that after death reminders exposure to symbols of motherhood can increase implicit self-evaluations, but only when these symbols do not expose the physicality of the female body in relation to motherhood. These findings advance a more comprehensive understanding of the functions served by symbols of motherhood and how these symbols can be used to promote women's well-being in health, social, and work domains. In a wider view, the content of symbols of motherhood reflects various processes that have shaped gender roles (Thurer, 1994) and seem to continue to affect perceptions of women in today's society. We are hopeful that future research would continue to uncover the psychological benefits that symbols of motherhood hold for women and society across life domains.

Chapter 4

Discussion

4.1. Overview

This thesis examined the capacity of cultural legacy to function as an existential anxiety buffer. We have seen that cultural legacy may serve existential functions through two motives that stem in human existence: the desire to make a meaningful contribution to the world that makes one stand out from other people, and the desire to merge oneself with a larger beyond, an enduring culture (Becker, 1973). Accordingly, this thesis examined the existential anxiety buffering functions of creative achievement as an avenue for the production of cultural legacy and of symbolic motherhood as an avenue for cultural legacy validation.

Chapter 2 focused on the capacity of creative achievement to serve as an existential anxiety buffer. In a review of the extant Terror Management Theory literature, it was concluded that creativity is related to managing death awareness. In support of the relationship between creativity and death awareness, a mini meta-analysis yielded a small-medium weight mean effect of death awareness on creativity. Finally, in a study of the existential anxiety buffering functions of creative achievement, it was found that when death awareness was high, high levels of creative achievement were associated with reduced thoughts of death in comparison to a control condition, but only among persons with high levels of creative goals. In other words, creative achievement served as existential anxiety buffer among people for whom creativity is a central cultural worldview component.

Chapter 3 focused on the capacity of symbols of motherhood to serve existential anxiety buffering functions. In three studies, it was found that exposure to symbols of

motherhood can serve anxiety buffering functions when death is salient, but only when they do not exhibit the physicality of the female body in relationship to motherhood. Specifically, after death reminders, exposure to symbols of motherhood in an abstract sketched icon or in realistic pictures of women that do not expose the physicality of the female body increased implicit self-evaluations. In contrast, exposure to women's portrayals that highlight the physical aspects of the female body after death reminders led to increased feelings of disgust. Overall, this evidence shows the anxiety buffering functions of symbols of motherhood (and boundary conditions of the symbolic properties of realistic representations of motherhood) in the face of death.

The cultural relevance and impact of the findings presented in this thesis can be seen in their implications for various real-life phenomena including the promotion of creativity in educational context and among established creative persons, counter-terrorism practices, and the use of symbols of motherhood to improve women's physical and psychological wellbeing in health, social, and work domains. In the next sections, I will outline research directions that follow-up on my interests in motherhood, terror management motivations, and their impact on everyday life. Building on the findings presented in Chapter 3, I will first present additional future directions for research on symbols of motherhood in everyday contexts. Next, I will outline three lines of research, of which two are independent and one is collaborative.[1]

The first line of research examines the impact of symbolic representations of motherhood in contemporary motherhood models on mothers' psychological well-being. In particular, this research focuses on the relationship between motherhood models and the level of intensive mothering they ascribe, personal characteristics, and mothers' well-being. In the second line of research, I present theory and preliminary evidence from a

[1] The studies presented in this thesis represent a selection out of a larger number of studies conducted during my PhD that include the collaborative line of research on scent presented in this chapter.

laboratory study which I facilitated as a part of a research project on the pre-symbolic functions of motherhood (Wisman, 2006). This research examined whether motherhood can have protective functions that operate not only on a symbolic level (as shown in Chapter 3) but also on a level that does not require the use of symbolic capacities (Wisman, 2006). Specifically, this research focused on the capacity of a mother's scent to elicit child-mother kin recognition in adulthood. The third line of research applies a terror management framework to understand the psychological underpinnings of people's negative attitudes and perceptions towards obese persons as a basis for developing a weight bias intervention in healthcare contexts.

4.2. Symbols of Motherhood in Everyday Life

Because of the pervasiveness of symbolic motherhood in contemporary society, the potential implications of its existential anxiety buffering effects are wide-ranging. In this section, I will present future directions for research on the impact of symbols of motherhood in everyday context, namely, political, environmental, and medical domains.

Symbolic motherhood has been used in the rhetoric and actions of political figures from Queen Elizabeth (Bowers, 1996) to Michele Obama (Buchanan, 2013). When death is salient, people's political attitudes are affected (Burke, Kosloff, & Landau, 2013). With the rise of security threats in everyday life (Stevens & Vaughan-Williams, 2016) and the occurrence of terror attacks just days before the 2017 elections in UK and France, it is important to understand existential motivations (and existential anxiety buffers) that may impact people's political perceptions and behaviours. Current evidence on the existential anxiety buffering functions of symbols of motherhood suggests that characteristics that relate to symbolic motherhood in political candidates could be sought and valued in the face of death. Specifically, political advantage may be gained by highlighting female candidates "natural" capacities such as diplomacy,

empathy (Deason, Greenlee, & Langner, 2015), and personal warmth (Deason, 2011). For example, through the use of custom political metaphors that highlight symbolic motherhood ("The mother of fair and square negotiations"), which can affect corresponding information processing (Ottati, Wilson, & Lambert, 2016). In addition, symbols of motherhood can inspire nationalistic notions in voters, particularly when people seek to re-affirm national identity and symbols under existential threat (e.g., Greenberg et al., 1990). For example, phrases that relate to the "motherland" seem to have served a unifying national function in post-communist Russia (White, 2003) and to have increased nationalistic defence in pre-modern Turkey (Delaney, 1995). Thus, symbols of motherhood have implications for political attitudes towards women candidates and for the pursuit of nationalistic goals in times of existential insecurity.

Symbolic motherhood can have effects on pro-environmental attitudes and behaviours after death reminders. While in many countries rates of self-reported environmental concern and action willingness are in excess of 50% (Franzen & Vogl, 2013), psychological factors contribute to their limited translation to actual pro-environmental behaviour (Gifford & Nilsson, 2014). Environmental phenomena such as disastrous hurricanes can be existentially threating due to their deadly consequences (Union of Concerned Scientists, 2017) as well as due to reminding humans that they are an inseparable part of the world of nature (Goldenberg et al., 2000). When death awareness is high, people show a decrease in pro-environmental concerns unless environmentalism is a source of self-esteem (Vess & Arndt, 2008) or a part of one's cultural worldview (Fritsche & Häfner, 2012; Selimbegović, Chatard, Er-Rafiy, & Pyszczynski, 2016). This suggests that having existential defences in place in face of an existential threat could serve to buffer against death awareness and promote adherence to pro-environmental values and norms among pro-environmentalists.

Current findings on the existential anxiety buffering functions of symbols of motherhood suggest that exposure to such symbols (e.g., Mother Earth; Spretnak, 1978) after being reminded of (existential) environmental threats could serve to manage the threat and promote worldview-consistent pro-environmental attitudes and behaviours. Alluding to values and using appealing pictures are among the markers of successful climate change communication (Wirth, Prutsch, & Grothmann, 2014). Accordingly, campaigns that highlight environmental threat followed by a graphic appeal to save Mother Earth may provide effective, action-promoting communication. Future research on the relationship between environmental threat, symbolic motherhood, and pro-environmental action is warranted, particularly in view of the need to consider psychological defences in climate change communication (Moser, 2016).

Medical settings, in which physical care and disease treatment are sought, may be considered a natural death prime. One way to buffer against death awareness in medical contexts including emergency and paediatric settings is via the affirmation of symbolic motherhood. The latter may serve to help medical staff's management of death exposure (Adriaenssens, De Gucht, & Maes, 2012) as well as to ease anxiety levels among waiting room visitors (Biddiss, Knibbe, & McPherson, 2014). For example, symbolic motherhood validation could be achieved via posters depicting symbols of motherhood as an element of interior design (e.g., Beukeboom et al., 2012). The findings presented in Chapter 3 suggest that images of symbols of motherhood that do not expose the physicality of the female body (e.g., mother embracing a baby) may be most effective for these aims.

4.3. Identifying Motherhood Models that Benefit Mothers

The transition to motherhood is a major life event that is multifaceted and entails both psychological benefits and costs. After having children, mothers report gains in meaning in life, hope, and positive feelings about oneself (Wells, Hobfoll, & Lavin, 1999), joy, happiness, and social acceptance (Donath, 2015). In some mothers, the transition to motherhood may engender personal growth (Ben-Ari, Shlomo, Sivan, & Dolizki, 2009), that is, significant improvement in interpersonal, psychological, and life perceptions (Tedeschi & Calhoun, 2004). On the other hand, mothers can experience loss of autonomy and occupational identity (Nicolson, 1999; Stone & Lovejoy, 2004) and loss of self and freedom (Donath, 2015) after having children. In discord with ideal motherhood images such as those portrayed by motherhood symbols and ideologies (Hays, 1996; Thurer, 1994), some mothers report regretting motherhood, experiencing motherhood as alien rather instinctual or natural, failing to be a 'perfect mother', lack of community support (Donath, 2015; Miller, 2007; Read et al., 2012) and experiencing aggression, anger, and rage towards their children (Rotkirch & Janhunen, 2009).

The discrepancies between culturally prescribed motherhood ideals and reality may lead to adverse outcomes in women (Douglas & Michaels, 2005; Guendouzi, 2006; Henderson, Harmon, & Newman, 2016; Liss et al., 2013; Wall, 2010). For example, ascribing to intensive mothering ideologies that advocate extreme dedication to childrearing (Douglas & Michaels, 2005; Hays, 1996) has been associated with negative psychological outcomes such as depression, stress, and lower life satisfaction (Rizzo et al., 2013). In a qualitative study, perceived deviations from standards of 'good' motherhood (e.g., prescribing exclusive breastfeeding) were associated with feelings of loneliness in mothers (Lee et al., 2017). In another study, pregnant women's experience of social pressure to bond with their infant positively predicted postnatal shame (Myers,

2017). Yet, mother's endorsement of traditional motherhood ideologies (e.g., "Mothers should stay at home to care for their children") varies (Walls, Helms, & Grzywacz, 2016) and its relationship with well-being is compounded by factors such as the desire to work and work status among mothers (Ciciolla, Curlee, & Luthar, 2017) and women in late pregnancy (Loyal, Sutter, & Rascle, 2017). In view of the complex relationship between endorsement of cultural motherhood ideals, work variables, and well-being among mothers, it is important to understand which motherhood models can be psychologically beneficial and for whom.

Motherhood models can be defined as representations of motherhood that outline specific configurations of work-family balance for mothers and differ in their adherence to intensive mothering, accessibility to mothers, and outcomes. One model that is highly consistent with intensive mothering is the '*stay-at-home mother*', a mother that is fully committed to the domestic sphere and the provision of constant care by a single caregiver (Johnston & Swanson, 2006). In 2012, stay-at-home mothers provided care for 28% of US children (Galley, 2014). According to qualitative studies, stay-at-home mothers self-sacrifice in personal (e.g., forgoing educational attainment. giving up all free time), interpersonal (decreased couple/family time), and employment (e.g., giving up one's 'dream job') domains (Horne & Breitkreuz, 2018). As children reach middle elementary school years, stay-at-home mothers continue to report difficulties (e.g., struggling for personal time, need for support by family and non-family members) alongside markers of a transitional period in their role as mothers such as feeling less needed than before and a desire to self-expand personally and professionally (Bean, Softas-Nall, Eberle, & Paul, 2016).

Quantitative evidence on the well-being of stay-at-home mothers is mixed. In an analysis of data from an annual US survey from 1972 to 2014 it was found that mother's

housewifery status was significantly associated with higher levels of happiness (Okulicz-Kozaryn & da Rocha Valente, 2017). In a study of 2,247 US mothers it was found that stay-at-home mothers report lower levels of fulfilment in comparison to employed mothers (Ciciolla et al., 2017). One possible explanation for the above discrepancy in findings relates to differences in stay-at-home mothers' desire to maintain a worker identity (Johnston & Swanson, 2007) that is inconsistent with intensive mothering. Among stay-at-home mothers, qualitative reports associate intensive mothering beliefs and decreased well-being (e.g., greater stress, less enjoyment in motherhood) (Bean et al., 2016). However, these outcomes may not manifest among stay-at-home mothers who value maintaining a worker identity and seem to reinforce their decision to stay home by embracing intensive mothering (Johnston & Swanson, 2007). Indeed, it has been found that stay-at-home mothers who did not want work had significantly higher levels of fulfilment and lower levels of emptiness, loneliness, and psychological distress in comparison to those who did want work (Ciciolla et al., 2017). Thus, the adverse outcomes of intensive mothering may manifest mostly in stay-at-home mothers who desire work and less so in stay-at-home mothers who do not want or are ambivalent about work.

Understanding the well-being outcomes of motherhood models for working women is particularly important in view of the high rates (72%) of employed mothers in England (Office for National Statistics, 2017) and the US (> 60% in married couple families) (U.S. Department of Labor, 2017). These models either conform to, negotiate, or reject intensive motherhood. Two models that are highly consistent with intensive mothering are the '*supermom*', a mother who can effortlessly navigate being both a successful career woman and an attentive homemaker without making sacrifices in work or childrearing (Dillaway & Paré, 2008) and its variant, the *'celebrity supermom'*, a

famous and successful career woman who prefers motherhood above all (e.g., the public image of Meg Ryan) (Douglas & Michaels, 2005). On the surface, 'supermom' representations seem progressive in successfully balancing childrearing and a career. However, because it is impossible to excel in intensive mothering while maintaining a successful career, these 'supermom' representations of motherhood are unattainable for most mothers (Douglas & Michaels, 2005; Stone & Lovejoy, 2004). In practice, employed mothers negotiate the tenets of intensive mothering so that they are able to maintain (an individually-constructed version of) a 'good' mother and worker identity (Damaske, 2013; Garey, 1995). For example, full-time employed mothers value quality over quantity of time spent with their children, delegate caregiving in a responsible manner, and limit work hours (Christopher, 2012; Guendouzi, 2006; Johnston & Swanson, 2007).

The negotiation of intensive motherhood is integral to the motherhood model of the *'mompreneur'*; a woman who holds both the identity of a mother and a business woman and who navigates the work-childcare conflict by creating a business venture that is often related to the experience of having children (e.g., creating educative toys) (Ekinsmyth, 2014; Richomme-Huet, Vial, & d'Andria, 2013). According to qualitative studies, mompreneurship offers a way for mothers to construct a professional identity while making flexible time arrangements for childrearing, thereby maintaining an individually-constructed version of 'good' mothering alongside a sense of meaning, autonomy, and self-fulfilment (Breen, 2014; Duberley & Carrigan, 2013; Göransson, 2016). The rates of mompreneurs are growing in Europe, Canada and the US (Richomme-Huet et al., 2013) with over 800,000 mompreneurs reported in the UK (Taylor, 2016). Nonetheless, the mompreneurship model is limited in terms of accessibility by challenges such as gaining the required business start-up knowledge and

finance and work-childcare schedule conflicts (Breen, 2014; Duberley & Carrigan, 2013; Nel, Maritz, & Thongprovati, 2010).

One motherhood model for employed mothers that is unrestricted by intensive mothering is that of the *'do-it-all working mother'*, a mother who takes responsibility for both career and family commitments and negotiates them in an idiosyncratic manner through active self-care and self-direction (Rottenberg, 2014). This model, exemplified by the public image of high profile figures such as Yahoo! CEO Marissa Mayer (Allen, French, & Barnett, 2016), may be particularly accessible to a selected group of career-oriented women who are in a position to adjust to workplace demands (McRobbie, 2013). In addition, it lacks consideration of factors such as work culture and the unaffordability of childcare which affects professional women's employment decisions once motherhood begins (Orgad, 2016).

In sum, the well-being outcomes of motherhood models may be shaped by mothers' level of adherence to intensive mothering and personal characteristics including work-related and intensive mothering beliefs. Intensive mothering may decrease well-being in stay-at-home mothers who want work but its impact on the well-being of those who do not want or are ambivalent about work warrants further research (Ciciolla et al., 2017; Johnston & Swanson, 2007). Among employed mothers, adverse well-being outcomes are associated with intensive mothering (Douglas & Michaels, 2005) and possibly with its individually-constructed versions (Johnston & Swanson, 2006; Johnston & Swanson, 2007), suggesting that intensive motherhood beliefs may adversely affect the well-being of mothers who adopt 'supermom' and mompreneurship models. Finally, the model of the 'do-it-all working mother' has limited accessibility and research on its well-being outcomes and their determinants is scant.

Images of ‘good’ motherhood are culturally-ingrained including in mothers who adopt motherhood models that are inconsistent with them (Maher & Saugeres, 2007) and are often associated with adverse outcomes in women. To enhance the well-being of mothers, I propose to investigate the impact of images of ‘good’ motherhood on mothers that adopt different motherhood models. Specifically, to examine the relationship between intensive motherhood beliefs and well-being among stay-at-home mothers, ‘supermoms’, mompreneurs, and ‘do-it-all working mothers’. Potential moderators of this relationship would include personality traits (e.g., openness to experience, neuroticism) (McCrae & John, 1992) and work and intensive mothering beliefs, for example as measured by the Intensive Parenting Attitudes Questionnaire (Liss et al., 2013). Samples may be recruited with the cooperation of online communities (e.g., mumsnet.com, mompreneuruk.com) and charities (e.g., NCT). Elucidating which motherhood models can be psychologically beneficial and for whom is likely to have wide-ranging implications including for the promotion of favourable motherhood models by policy-makers, women’s work participation, gender roles in family and employment domains, and national fertility rates. Follow-up investigations could focus on the identification of system and personal barriers to mothers’ pursuit of psychologically beneficial motherhood models.

4.4. The Scent of a Mother

Scent serves as a primal means of communication among humans via chemical signals produced by pheromones (Wysocki & Preti, 2004). Olfactory cues in mammals are used to convey a multitude of messages including information on attention seeking, distress, frustration, pain, and reproductive fitness (Doty, 1986) and elicit various behaviours including maternal care, recognition, and protection of offspring (Corona & Lévy, 2015). In humans, the functions of olfactory cues include social communication, danger

detection and avoidance, signalling reproductive fitness, and food intake regulation (Lübke & Pause, 2015; Stevenson, 2009), ultimately promoting motives of survival and reproduction (Pause, 2012). In addition, olfactory cues can communicate information on emotional states (Semin & De Groot, 2013) and inspire positive emotions such as happiness, calm and comfort and negative emotions such as fear, anxiety and disgust (Croy, Olgun, & Joraschky, 2011; Stevenson, 2009).

The development of the olfactory system in humans in highly malleable, plastic, and significantly shaped by learning from birth onwards (Schaal, 1988; Stevenson, 2009) so that different scents whether artificial or bodily can gain the potential to motivate different behaviours (Schaal, 1988). For example, it has been found that exposure to a familiar scent reduced crying and oxygen consumption in neonates (Sadathosseini, Negarandeh, & Movahedi, 2013). Nonetheless, olfactory signals may affect behavioural motivation in the absence of any prior associations or conscious processing. For instance, it has been shown that exposure to a chemical signal that is found in the scent of dead bodies can elicit threat management (e.g., fight) responses (Wisman & Shrira, 2015). Others have found that unconscious exposure to olfactory cues can decrease social trust (Lee & Schwarz, 2012). Thus, olfactory signals including those that originate in the human body can affect human behaviour consciously through their detection and subsequent cognitive interpretation as well as unconsciously via producing emotions independently of cognitive assessment (Kohl, Atzmueller, Fink, & Grammer, 2001).

The olfactory system has in important role in promoting mother-newborn bonding and relationship. Olfactory cues hold multiple advantages over other senses as a mechanism of kin recognition (Porter, 1998). For example, in view of the limited function of other sensory abilities (e.g., vision) upon birth, olfactory cues are particularly important and useful for newborns (Doty, 1986). It has been established that newborns

can recognize the odour of their mother and prefer it to that of alien mothers (Marin, Rapisardi, & Tani, 2015; Russell, 1976). Furthermore, maternal olfactory cues that originate in the prenatal environment (Schaal, Marlier, & Soussignan, 1998) or in the maternal body (Schaal, Doucet, Sagot, Hertling, & Soussignan, 2006) can regulate various infant's postnatal behaviours such as ingestive behaviours (e.g., breastfeeding initiation, appetite)(Stevenson, 2009), crying, and mouthing, and can reduce discomfort in infants (Winberg, 2005). In turn, the infant's ability to recognize the unique maternal scent signature and to respond preferentially to it may form a basis for the development of mother-infant attachment (Winberg & Porter, 1998).

Mothers are able to recognize their babies' scent and their behaviour is affected by it. Mothers are able to discriminate the scent of their baby postpartum, even after very limited exposure (Porter, 1998), with reported recognition rates ranging 66% to 100% (Dubas, Heijkoop, & Van Aken, 2009). For example, in a study of 42 mothers it has been found that 90% of mothers successfully identified the scent of their newborn's t-shirt from that of two other babies after an exposure of 10-60 minutes to infant (Kaitz, Good, Rokem, & Eidelman, 1987). Others have found that mothers were able to correctly identify their biological children in three studies (Weisfeld, Czilli, Phillips, Gall, & Lichtman, 2003). In line with this, in a qualitative study of adoptive parents in the UK, mothers reported that the odour of the adopted child was alien and strange and that it affected the ease of bonding with the child (Selwyn & Meakings, 2015). In another study, mothers who were high on olfactory recognition of their children reported using less physical punishment, suggesting greater emotional investment in children with recognizable odours (Dubas et al., 2009). In yet another study, it was found that approximately 90% mothers of infants reported positive olfactory experiences with their

infant head odour, namely, feeling affectionate towards it and sniffing it for affective reasons (Okamoto, Shirasu, Fujita, Hirasawa, & Touhara, 2016).

The above evidence show that scent recognition serves multiple functions in the mother-child relationship and suggest that the recognition of a mother's unique scent signature may affect the offspring's emotional experiences and behaviour. If mother's scent can affect regulatory process and behaviours in their offspring, it would be interesting to examine if these effects persist into adulthood (Wisman & Perach, 2018). Can the scent of a mother serve to alleviate discomfort in adults? To provide a sense of protection and decrease defensive reactions? To affect anxiety symptoms and anxiety behaviours? This can be examined via the non-intrusive collection of a mother's biological scent and investigating adult children's ability to recognize it in a standard olfactory discrimination task (Gellrich, Stetzler, Oleszkiewicz, Hummel, & Schriever, 2017). Because different body sites elicit different scents, it is possible to examine kin-recognition abilities of different bodily sites. For example, previous investigations have collected scent samples from people's armpit (Roberts et al., 2011), upper chest (Gallagher et al., 2008), and neck (Schaal, 1986). In a preliminary laboratory study of 35 University of Kent students, we have found initial support for increased recognition of the scent of mother's neck by their adult children (Wisman & Perach, 2018). Future confirmatory studies on this relationship utilizing larger samples are warranted.

4.5. Reducing Weight Bias in Healthcare Contexts

Obesity is a major health problem that is highly prevalent in the UK, affecting 20% of UK adults and a projected 70% of the UK population by 2020 (Rennie & Jebb, 2005; Wang, McPherson, Marsh, Gortmaker, & Brown, 2011). The term *weight bias* refers to people's negative attitudes and beliefs about obese persons (Maïano & Aimé, 2017). These include associating obesity with negative personal traits such as unattractive, lazy,

unsuccessful, disgusting, unintelligent, sloppy, emotionally unstable, lacking self-discipline, and incompetent (Puhl & Brownell, 2001; Puhl & Heuer, 2009). Weight bias is one of the most prevalent forms of discrimination (Puhl, Andreyeva, & Brownell, 2008) with rates as high as 40% reported in national US samples (Himmelstein, Puhl, & Quinn, 2017).

The adverse outcomes of weight bias to the obese individual are considerable including body dissatisfaction, low self-esteem, depressive and anxiety symptoms, stress possibly leading to cardiovascular diseases, and unhealthy eating behaviours (Ekeagwu, 2017; Papadopoulos & Brennan, 2015; Puhl & Heuer, 2009; Tomiyama, 2014). Weight bias is present across life contexts including education, employment, media, and importantly, healthcare settings (Chou, Prestin, & Kunath, 2014; Puhl & Heuer, 2009). For example, in the UK, physicians, nurses, and dietitians show a victim-blaming approach towards obese patients (e.g., the belief that obesity is due to obese persons' unhealthy lifestyle) (Ekeagwu, 2017). Health professionals' weight bias leads to substandard healthcare experiences and poor service use among obese persons (Ekeagwu, 2017) who are at high risk for weight-related comorbidities (e.g., heart disease) (Bray, 2011) and for whom quality of healthcare is essential. Furthermore, from a public health perspective, weight bias contributes to health disparity, social inequality, and hampers obesity prevention efforts (Puhl & Heuer, 2010). Based on this overview, it is clear that there is a need to reduce weight bias in order to promote improve obese persons' health. However, knowledge on the cornerstones for of an effective intervention to reduce weight bias is limited (Daníelsdóttir, O'brien, & Ciao, 2010).

One theory that has been successfully applied to understand health bias and actions is Terror Management Theory (TMT) (Goldenberg & Arndt, 2008; Greenberg et al., 1986). According to TMT, humans' desire to survive conflicts with their unique

capacity to understand their mortal nature. This existential paradox can lead to severe anxiety that is managed by investing in psychological mechanisms that offer the promise of immortality (e.g., cultural worldviews). From this perspective, reminders of the physicality of the human body, for example physically vulnerable bodies of older persons (Martens, Goldenberg, & Greenberg, 2005) or reproductive female bodies (Morris et al., 2014) can elicit death awareness and a motivation to manage the consequent anxiety by re-affirming one's cultural beliefs.

Obesity exposure can serve as reminder of one's mortal nature through multiple avenues. Because obesity involves visible excess body weight, exposure to the physical attributes of an obese person may make salient one's own (mortal) physicality. In addition, because obesity is associated with chronic health conditions exposure to obesity could evoke thoughts of its life-threatening outcomes, thereby increasing one's death awareness. Indeed, obesity has been implicitly associated with disease-related concepts (Park, Schaller, & Crandall, 2007). Also, because obesity exposure can activate beliefs of lack of self-control (e.g., "some people are fat because they have no will power"; Crandall, 1994), it may engender animalistic associations that serve as a death reminder. From a TMT perspective, to manage the awareness of death elicited by obesity exposure, people may seek to reinforce cultural beliefs on obese persons that are based either on cultural value ("obese persons eat healthily") or disapproval ("obese persons are lazy"). In other words, following obesity exposure, people may endorse beliefs that either associate them with or distance them from obese persons on a symbolic level. These inclusive and exclusive worldview-defence avenues, respectively, are detailed next.

Inclusive worldview defence in response to obesity exposure represents an expansion of one's cultural worldviews to include culturally-valued perceptions of obese persons. It has been found that having a positive conversation with an obese person

(Koball & Carels, 2015) or imagining an obese person that holds culturally-valued characteristics (e.g., confident, attractive) (Dunaev, Brochu, & Markey, 2017) significantly reduced weight bias in comparison to a control intervention. Others have found that exposure to pictures of obese persons elicited less disgust when they engaged in healthy behaviours in comparison to unhealthy behaviours (Vartanian, Trewartha, Beames, Azevedo, & Vanman, 2017). Finally, exposure to a (culturally-valued) nutrition expert who was "fat" in comparison to a "non-fat" expert decreased weight bias following an educational module (Hague & White, 2005). Thus, providing information on obese persons' likability, culturally-endorsed eating habits, or valued qualifications contributed to more positive and less disgusting perceptions of obese persons. In other words, highlighting obese persons' culturally-valued characteristics following obesity exposure elicited inclusive worldview defence and eliminated weight bias.

Exclusive worldview defence in response to obesity exposure represents an adherence to one's cultural worldviews via distancing oneself from its perceived violators. This can manifest in disgust or outgroup derogation. Disgust is an emotion that may arise in response to the sight of the human body, for example the pregnant body (Perach & Wisman, 2017) or bodily products (e.g., faeces) (Cox, Goldenberg, Pyszczynski, & Weise, 2007). Functionally, disgust may serve to signal the violation of moral codes (Rozin et al., 2000), particularly body-related ones (Russell & Giner-Sorolla, 2013) and the condemnation of those who transgress society's values and morals (Kupfer & Giner-Sorolla, 2016). From a TMT perspective, disgust may serve to validate cultural worldviews in the face of mortality awareness, acting as a symbolic anxiety-buffering mechanism (Goldenberg et al., 2001). In response to obesity, disgust may arise to signal the violation of social values that pertain to body size and shape (Vartanian, 2010) or lack of moral virtue (e.g., gluttony) (O'Brien et al., 2013). Indeed, people

associate and respond to obese persons with disgust, which leads to weight bias and possibly discriminative behaviour towards them (Levine & Schweitzer, 2015; Vartanian, 2010; Vartanian, Thomas, & Vanman, 2013; Vartanian et al., 2017). For example, it has been found that after viewing a picture of an obese person in comparison to the same person in healthy weight people experienced increased disgust, which in turn led to higher levels of negative bias and attitudes towards that person and a desire for greater social distance from that person (Vartanian, Trewartha, & Vanman, 2016). In three studies, obesity exposure has been associated with self-reported disgust, but not with physiological markers of disgust, suggesting that the association between obesity and disgust may operate on a socio-cognitive level rather than a physiological one (Vartanian et al., 2017). Another form of exclusive worldview defence is outgroup derogation, which can manifest in weight bias. For example, it has been found that weight bias becomes more pronounced after mortality reminders, but only among participants who view overweight people as an outgroup (Seibert, Schindler, & Reinhard, 2015).

Taken together, the above evidence show that people respond to obesity by re-affirming their cultural beliefs in an inclusive (e.g., increased ingroup membership) or exclusive (e.g., disgust) manner. Grounded in TMT, the Psychological Response to Obesity (PRO) theoretical model (Figure 1) posits that that obesity exposure (e.g., meeting an obese person) serves as reminder of one's mortal nature because of the salient bodily aspects of obesity, thereby eliciting death awareness. To manage the consequent anxiety, people have a need to defend their cultural worldviews. According to the PRO model, if obese persons' culturally-valued characteristics are highlighted following obesity exposure, people engage in inclusive worldview defence to restore psychological balance, which removes the need to engage in weight bias. When no additional information is provided following obesity exposure, people engage in exclusive

worldview defence, thereby manifesting weight bias. This account elaborates existing conceptions of weight bias as a form of symbolic racism that is driven by intolerance towards social transgressors (Crandall, 1994). Furthermore, the model focuses on the unconscious motivations and social perceptions of obese persons that drive weight bias, in accord with the recommendations of a recent review of 16 weight bias intervention studies (Daníelsdóttir et al., 2010). In order to examine how weight bias can be reduced, there is a need to understand the underlying psychological motivations of weight bias and to apply this knowledge to develop effective weight bias interventions in healthcare contexts. Accordingly, I propose to examine the conditions under which people engage in inclusive and exclusive worldview defence in response to obesity exposure and their relationship to weight bias. This research plan would include a series of studies that set out to validate the PRO model and to apply it in healthcare contexts based on existing methodologies (Kushner, Zeiss, Feinglass, & Yelen, 2014; Puhl, Latner, King, & Luedicke, 2014).

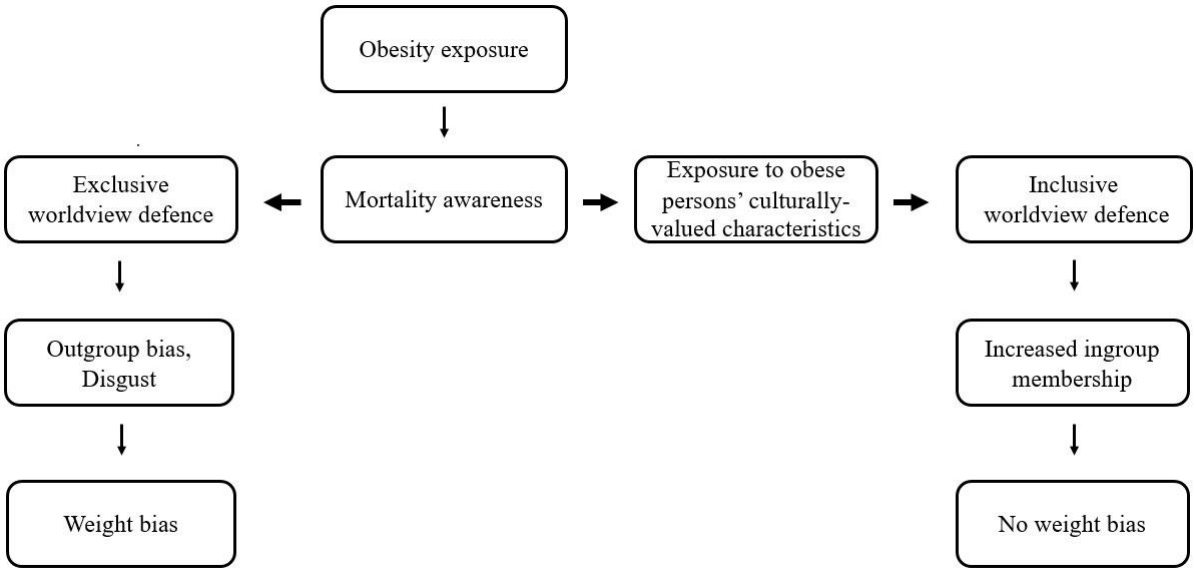

Figure 1. Psychological Response to Obesity (PRO) theoretical model

4.6. Conclusion

This thesis examined if, and by which avenues, can cultural legacy can help to manage existential concerns in face of death awareness. I have presented evidence on the existential anxiety buffering functions of creative achievement (a cultural legacy production avenue) and symbols of motherhood (a cultural legacy validation avenue). Taken together, current evidence supports the notion that the pursuit of cultural legacy is one psychological motivation that affects people's attitudes and behaviours, particularly when awareness of one's finite existence is high. These findings highlight the psychological anxiety buffering functions of culture that come into play in people's everyday life, for example when engaging in behaviours such as song-writing or when encountering an image of "perfect" motherhood in an online post. In this thesis, I have outlined various avenues for the continued investigation of the potential real-life applications of the research presented in this thesis and I am hopeful that this future research would contribute to people's wellbeing across life domains.

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Appendices

Appendix 1. Materials used in the study presented in Chapter 2

1. Creative Achievement Questionnaire (Carson et al., 2005).

I. Place a check mark beside the areas in which you feel you have more talent, ability, or training than the average person.

__ visual arts (painting, sculpture)

__ music

__ dance

__ individual sports (tennis, golf)

__ team sports

__ architectural design

__ entrepreneurial ventures

__ creative writing

__ humor

__ inventions

__ scientific inquiry

__ theater and film

__ culinary arts

II. Place a check mark beside sentences that apply to you. Next to sentences with an asterisk (*), write the number of times this sentence applies to you.

A. Visual Arts (painting, sculpture)

__ 0. I have no training or recognized talent in this area. (Skip to Music).

__1. I have taken lessons in this area.

__2. People have commented on my talent in this area.

__3. I have won a prize or prizes at a juried art show.

__4. I have had a showing of my work in a gallery.

__5. I have sold a piece of my work.

__6. My work has been critiqued in local publications.

*__7. My work has been critiqued in national publications.

B. Music

__0. I have no training or recognized talent in this area (Skip to Dance).

__1. I play one or more musical instruments proficiently.

__2. I have played with a recognized orchestra or band.

__3. I have composed an original piece of music.

__4. My musical talent has been critiqued in a local publication.

__5. My composition has been recorded.

__6. Recordings of my composition have been sold publicly.

*__7. My compositions have been critiqued in a national publication.

C. Dance

__0. I have no training or recognized talent in this area (Skip to Architecture)

__1. I have danced with a recognized dance company.

__2. I have choreographed an original dance number.

__3. My choreography has been performed publicly.

__4. My dance abilities have been critiqued in a local publication.

__5. I have choreographed dance professionally.

__6. My choreography has been recognized by a local publication.

*__7. My choreography has been recognized by a national publication.

D. Architectural Design

__0. I do not have training or recognized talent in this area (Skip to Writing).

__1. I have designed an original structure.

__2. A structure designed by me has been constructed.

__3. I have sold an original architectural design.

__4. A structure that I have designed and sold has been built professionally.

__5. My architectural design has won an award or awards.

__ 6. My architectural design has been recognized in a local publication.

*__7. My architectural design has been recognized in a national publication.

E. Creative Writing

__0. I do not have training or recognized talent in this area (Skip to Humor).

__1. I have written an original short work (poem or short story).

__2. My work has won an award or prize.

__3. I have written an original long work (epic, novel, or play).

__4. I have sold my work to a publisher.

__5. My work has been printed and sold publicly.

__6. My work has been reviewed in local publications.

*__7. My work has been reviewed in national publications.

F. Humor

__0. I do not have recognized talent in this area (Skip to Inventions).

__1. People have often commented on my original sense of humor.

__2. I have created jokes that are now regularly repeated by others.

__3. I have written jokes for other people.

__ 4. I have written a joke or cartoon that has been published.

__5. I have worked as a professional comedian.

__6. I have worked as a professional comedy writer.

__7. My humor has been recognized in a national publication.

G. Inventions

__0. I do not have recognized talent in this area.

__1. I regularly find novel uses for household objects.

__2. I have sketched out an invention and worked on its design flaws.

__3. I have created original software for a computer.

__4. I have built a prototype of one of my designed inventions.

__5. I have sold one of my inventions to people I know.

*__6. I have received a patent for one of my inventions.

*__7. I have sold one of my inventions to a manufacturing firm.

H. Scientific Discovery

__0. I do not have training or recognized ability in this field (Skip to Theater)

__1. I often think about ways that scientific problems could be solved.

__2. I have won a prize at a science fair or other local competition.

__3. I have received a scholarship based on my work in science or medicine.

__4. I have been author or coauthor of a study published in a scientific journal.

*__5. I have won a national prize in the field of science or medicine.

*__6. I have received a grant to pursue my work in science or medicine.

__7. My work has been cited by other scientists in national publications.

I. Theater and Film

__0. I do not have training or recognized ability in this field.

__1. I have performed in theater or film.

__2. My acting abilities have been recognized in a local publication.

__3. I have directed or produced a theater or film production.

__4. I have won an award or prize for acting in theater or film.

__5. I have been paid to act in theater or film.

__6. I have been paid to direct a theater or film production.

*__7. My theatrical work has been recognized in a national publication.

J. Culinary Arts

__0. I do not have training or experience in this field.

__1. I often experiment with recipes. __2. My recipes have been published in a local cookbook.

__3. My recipes have been used in restaurants or other public venues.

__4. I have been asked to prepare food for celebrities or dignitaries.

__5. My recipes have won a prize or award.

__6. I have received a degree in culinary arts.

*__7. My recipes have been published nationally.

K. Please list other creative achievements not mentioned above.

Scoring of the Creative Achievement Questionnaire

1. Each checkmarked item receives the number of points represented by the question number adjacent to the checkmark.

2. If an item is marked by an asterisk, multiply the number of times the item has been achieved by the number of the question to determine points for that item.

3. Sum the total number of points within each domain to determine the domain score.

4. Sum all ten domain scores to determine the total CAQ score.

2. Creative Goals (Perach & Wisman., 2016).

The following items refer to one's goals. For each item on this page, choose the answer (from the choices presented below) that best reflects how likely you are to set that as a goal for yourself.

Items:

1. You will produce a great creative work

2. You will make an important contribution in the field of art or science

3. Your creative work will be acknowledged by experts in your field

4. You will create work with enduring value that is original and useful.

Scale:

1 = NO CHANCE I will set this goal for myself

2 = Slight chance I will set this goal for myself

3 = Moderate chance I will set this goal for myself

4 = Very good chance I will set this goal for myself

5 = Definitely WILL set this goal for myself

3. Fear of Death scale (Templer, 1970)

Please rate the extent the following statements apply to you. Mark each statement as either true or false.

	True	False
I am very much afraid to die		
The thought of death seldom enters my mind		
It doesn't make me nervous when people talk about death		
I dread to think about having to have an operation		
I am not at all afraid to die		
I am not particularly afraid of getting cancer		
The thought of death never bothers me		
I am often distressed by the way time flies so very rapidly		
I fear dying a painful death		
The subject of life after death troubles me greatly		
I am really scared of having a heart attack		
I often think about how short life really is		
I shudder when I hear people talking about a World War III		
The sight of a dead body is horrifying to me		
I feel that the future holds nothing for me to fear		

4. Fear of Public Speaking scale (based on Cox et al., 2009)

Please rate the extent the following statements apply to you. Mark each statement as either true or false.

	True	False
I am very much afraid to speak in public		
The thought of speaking in public seldom enters my mind		
It doesn't make me nervous when people talk about public speaking		
I dread to think about having to speak in public		
I am not at all afraid to speak in public		
I am not particularly afraid of presenting my work in public		
The thought of public speaking never bothers me		
I am often distressed by the way other people might judge me		
I fear talking in public would be a terrible experience		
The subject of my public presentation skills troubles me greatly		
I am really scared of presenting on a public stage		
I often think about how scary it is to talk in public		
I shudder when I hear people talking about public gatherings		
The sight of a large crowd is horrifying to me		
I feel that the future holds nothing for me to fear		

5. Positive and Negative Affect Scales (Watson et al., 1988)

This scale consists of a number of words 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 do you feel this way right now **(that is, at the present moment)**.

	very slightly or not at all	a little	moderately	quite a bit	extremely
interested					
distressed					
excited					
upset					
strong					
guilty					
scared					
hostile					
enthusiastic					
proud					
irritable					
alert					
ashamed					
inspired					
nervous					
determined					
attentive					
jittery					
active					
afraid					

6. Death thought accessibility (based on Arndt et al., 1997).

Please complete the following by filling letters in the blanks to create words. Note, we are measuring how fast you are on this task so please write down the first word that comes to your mind! Obviously there are no right and wrong answers. Fill in one letter per blank. Some words may be plural. Thank you.

CA_
BUR_ _D
SH_ _E
WAT_ _
DE_ _
FL_W_R
DE_ _Y
POST_ _
STRE_ _
CL_ _K
GR_ _E
P_P_R
_UILT
CA_ _
PA_ _
LA_ _ _
M_J_R
O_D
_ORROW
COF_ _E
SA_
B_ _K
B_T_LE
SK_ _L
P_ _TURE

7. Worldview defence essay (based on Greenberg et al., 1990).

In this section, you will find a part of an article published in a magazine some months ago. In this article the author discusses the issue of creative achievement. Please read the text carefully and answer the questions that follow.

How valuable is it to create something that is new, useful, and appreciated by others in present or future? Not valuable at all. The truth is that all creative achievements are forgettable. What is novel and valued in one time is not in another. For example, in the past it was believed that the world is flat, but that belief is worthless now. Even more so in today's world, due to the continuous advances in technology, the value of creative achievements can only be temporary. A creative achievement may be valuable for a moment, but it will shortly be devalued, replaced by other advances, and ultimately forgotten. Does anyone really remember who invented the audio cassette? Even contemporary creators find that their inventions are becoming irrelevant as time goes by. So, creative contributions are short-lived, forgettable, and have no lasting impact. It is time to face facts and see that there is no continuous value to creative achievements.

To what extent...
1. do you like the author?
2. do you think the author is intelligent?
3. do you think the author is knowledgeable?
4. do you agree with the opinion expressed in the essay?
5. do you think the opinion expressed in the essay is valid?

Scale: 1 (not at all) to 9 (very much)

Appendix 2. Materials used in the studies presented in Chapter 3

1. Rosenberg Self-Esteem Scale (Rosenberg, 1965) (Study 1, Study 2, Study 3)

Please rate your level of agreement with the following statements.

1. On the whole, I am satisfied with myself.

2. At times I think I am no good at all.

3. I feel that I have a number of good qualities.

4. I am able to do things as well as most other people.

5. I feel I do not have much to be proud of.

6. I certainly feel useless at times.

7. I feel that I'm a person of worth.

8. I wish I could have more respect for myself.

9. All in all, I am inclined to think that I am a failure.

10. I take a positive attitude toward myself.

Scale: 1 (Strongly Disagree) to 5 (Strongly Agree)

2. Implicit hope (Study 1)

Next, you will be presented with six words of different languages. We are interested in your intuition about the meaning of these words. Each word will be presented briefly, and you will then be asked to what extent do you think this word conveys hope. Try to respond as quickly as possible. There are no right or wrong answers. When you are ready to see the first word, proceed to the next page.

Items:

ikheshi

erevheta

výtah

ararewa

isinyusi

wiishka

Scale:

This word conveys hope

1 – Not at all	2	3	4	5	6	7	8	9	10 – Very much so

3. Positive and Negative Affect Scales (Watson et al., 1988) (Study 1, Study 2, Study 3)

See Appendix 1, measure 5.

4. Death thought accessibility measure (based on Arndt et al., 1997) (Study 1)

See Appendix 1, measure 6.

5. Neuroticism subscale, Big Five Inventory (Benet-Martinez & John, 1998) (Study 2, Study 3)

Here are a number of characteristics that may or may not apply to you. Please choose a number for each statement to indicate the extent to which you agree or disagree with that statement.

I see myself as someone who...

1. is depressed, blue

2. is relaxed, handles stress well

3. can be tense

4. is emotionally stable, not easily upset

5. worries a lot

6. can be moody

7. remains calm in tense situations

8. gets nervous easily

Scale: 1 (Disagree strongly) to 5 (Agree strongly)

6. Wordsearch puzzle (Study 2)

This is a word search task. In the word search below, there are several words that belong to the category of "**Furniture**". Please locate **two words that belong to the category "Furniture"** and list them in the space below.

A	P	M	T	Y	X	D	E
C	U	P	B	O	A	R	D
K	T	G	S	O	U	A	S
J	A	Q	N	U	M	W	H
I	B	K	E	R	X	E	E
Y	L	O	W	S	H	R	L
B	E	V	C	N	O	R	F
L	A	C	H	A	I	R	N

7. Death/fear/disgust thought accessibility measure (based on Arndt et al., 1997) (Study 2)

Next, you will be asked to fill in the blanks with letters to create words. Note, we are measuring how fast you are on this task so please write down the first word that comes to your mind! Obviously there are no right and wrong answers. Fill in one letter per blank. Some words may be plural. Thank you.

Write the first word that comes to mind by filling in one letter per blank space.

ORAN_ E

_EAR

CH_ _ R

GRE_ N

GR_ _ E

TR_ _

_UKE

CA_

S_ _ K

WAT _ _

FL_WER

POST_ _

SK_ _ L

CL_ CK

P_ P_ R

S_ ARED

_ AIR

MAJ_ R

O_ D

COF _ _ E

_ _ RROR

B_ _ K

DIS_ U_ T

B_ TTLE

_ _ IGHT

P_ _ TURE

CA_ _

_ ILE

_ AMP

BUR_ ED

DO_ _

SHE _ F

8. Implicit meaning in life (Study 3)

Next, you will be presented with six words of different languages. We are interested in your intuition about the meaning of these words. Each word will be presented briefly, and you will then be asked to what extent do you think this word conveys hope. Try to respond as quickly as possible. There are no right or wrong answers. When you are ready to see the first word, proceed to the next page.

Items:

syfte

chinangwa

účel

manufa

injongo

ujeedada

Scale:

This word conveys “meaning in life”

1 – Not at all	2	3	4	5	6	7	8	9	10 – Very much so