Thirty Years of Terror Management Theory

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Thirty Years of Terror Management Theory: From Genesis to Revelation

Tom Pyszczynski*,[1], Sheldon Solomon[†], Jeff Greenberg[‡]
*Department of Psychology, University of Colorado Colorado Springs, Colorado Springs, Colorado, USA
[†]Department of Psychology, Skidmore College, Saratoga Springs, New York, USA
[‡]Department of Psychology, University of Arizona, Tucson, Arizona, USA
[1]Corresponding author: e-mail address: tpyszczy@uccs.edu

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Abstract

Terror management theory posits that human awareness of the inevitability of death exerts a profound influence on diverse aspects of human thought, emotion, motivation, and behavior. People manage the potential for anxiety that results from this awareness by maintaining: (1) faith in the absolute validity of their cultural worldviews and (2) self-esteem by living up to the standards of value that are part of their worldviews. In this chapter, we take stock of the past 30 years of research and conceptual development inspired by this theory. After a brief review of evidence supporting the theory's fundamental propositions, we discuss extensions of the theory to shed light on: (1) the psychological mechanisms through which thoughts of death affect subsequent thought and behavior; (2) how the anxiety-buffering systems develop over childhood and beyond; (3) how awareness of death influenced the evolution of mind, culture, morality, and religion; (4) how death concerns lead people to distance from their physical bodies and seek solace in concepts of mind and spirit; and (5) the role of death concerns in maladaptive and pathological behavior. We also consider various criticisms of the theory and alternative conceptualizations that have been proposed. We conclude with a discussion of what we view as the most pressing issues for further research and theory development that have been inspired by the theory's first 30 years.

And the Lord God commanded the man, saying, . . . of the tree of the knowledge . . . thou shalt not eat of it: for in the day that thou eatest thereof thou shalt surely die. . . And when the woman saw that the tree was . . . to be desired to make one wise, she took of the fruit thereof, and did eat, and gave also unto her husband with her; and he did eat. And the eyes of them both were opened, and they knew that they were naked . . . And unto Adam he said, Because thou hast . . . eaten of the tree . . . cursed is the ground for thy sake; In the sweat of thy face shalt thou eat bread, till thou return unto the ground; for out of it wast thou taken: for dust thou art, and unto dust shalt thou return.

Genesis Chapters 2 and 3, King James Version

And I saw the dead, small and great, stand before God; and . . . the dead were judged . . . according to their works . . . And God shall wipe away all tears from their eyes; and there shall be no more death. . .

Revelation 20 and 21, King James Version

s0005 1. INTRODUCTION: PURPOSE AND GOALS OF THE THEORY

p0010 Terror Management Theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986; Solomon, Greenberg, & Pyszczynski, 1991, 2015) was

originally developed 30 years ago to address three broad questions about the roots of human motivation and behavior: (1) Why do people need self-esteem? (2) Why do people need to believe that out of all the possible ways of understanding the world, theirs is the one that happens to be correct? (3) Why do people who are different from each other have such a hard time peacefully coexisting? Back then, the three of us had recently finished our graduate studies in experimental social psychology and were beginning to settle into academic positions. Social cognition was flourishing, as many psychologists attempted to explain virtually all human behavior in terms of the workings (and sometimes mis-workings) of an information processing system; computers as a metaphor for the functioning of the human mind dominated the field. Emotions and motives, when they were discussed, were viewed as particular types of information deployed by cognitive systems to guide behavior. Indeed, it was not unusual to engage in discussions with respected proponents of this approach who, while acknowledging that cognitive analyses had not yet reached the point where they could provide comprehensive explanations for *all* behavior, argued that eventually such information processing perspectives would eliminate the need for motivational and emotional constructs in psychological theorizing.

p0015 While intrigued by many of the new ideas and methods that came out of the purely cognitive approach, we also felt that some important things were missing from the social psychological discourse in the early 1980s.[1] For starters, the field consisted almost exclusively of a plethora of mini-theories focused on explicating the concrete details of psychological processes rather than tackling broad questions about *why people behave the way they do*. It seemed to us that social psychologists were more devoted to explaining the findings of laboratory experiments than elucidating the real world phenomena that these experiments were purportedly designed to help us understand (Greenberg, Solomon, Pyszczynski, & Steinberg, 1988). Indeed, students in our classes bemoaned the lack of central organizing principles for grasping the long lists of fascinating findings about human behavior that were cataloged by the textbooks of the day. In addition, social psychology seemed intellectually isolated, both from other related academic disciplines and from previous developments in the field of psychology itself. In particular, psychological science had all but outlawed consideration of

np0005 [1] Whether our criticisms of the state of social psychology in the early 1980s were reasonable and justified is a question that is open to debate and obviously a matter of personal and professional opinion. We discuss these impressions here because they were important to *us* at the time and played an important role in what we hoped to accomplish with TMT. Whether these concerns continue to apply to the field today is another open question that we think worthy of discussion and debate.

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psychoanalytic and existential ideas in theory construction and empirical research. Yet when we first encountered and seriously entertained such ideas *after* completing our graduate education, we were stunned by their relevance to the questions that social psychologists pondered and to the panoply of pressing problems that plagued people in their daily lives.

p0020 TMT was our attempt to redress some of what we thought was missing from the field of social psychology at that time. We aimed at producing a theory focused on basic "why" questions regarding the roots of social motivation and behavior. We sought to bring together ideas, old and new, to illustrate important insights that could be gleaned from various sources rarely given much credence within academic psychology. We also hoped to show that applying state of the art experimental methods to test such ideas would infuse them with new life by establishing their empirical credibility. We wanted to develop a theory that was integrative and synthetic; a theory that would shed light on diverse and superficially disparate human phenomena that would itself be refined due to engagement with these phenomena and the conceptual and empirical traditions that surrounded them. Although we didn't realize it at the time, TMT was part of an emerging wave of broader and more integrative theories within social psychology, including self-determination theory (Deci & Ryan, 1980) and evolutionary psychology (e.g., Buss, 1989). In the Enlightenment tradition, we wanted the theory to provide insights about the human condition that could be useful for fostering personal growth and social progress; accordingly, we concluded our first presentation of the theory in *Advances in Experimental Social Psychology* (Solomon et al., 1991, p. 146) with a section entitled, "Toward an Applied Experimental Social Psychology."

p0025 We also wanted to draw attention to the problem of death and the possibility that the uniquely human awareness of this existential certainty might play an important role in life. We had never encountered even passing reference to existential concerns in the psychological literature of the day. But given how hard humans (and indeed, all forms of life) usually strive to stay alive, it seemed extremely unlikely to us that knowledge of the inevitability of death would *not* have vital cognitive, emotional, and behavioral consequences. TMT posits that the fear of death lies at the root of some very important psychological motives. To clarify a common misconception, though, our view has never been that the fear of death is the *only* motivational force that drives human behavior; e.g., in our first TMT chapter in *Advances*, we noted that ". . .it is important to acknowledge that this theory focuses on one particular motive. . . many other factors, both historical and

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psychological, need to be considered to fully understand the determinants of any particular human behavior" (Solomon et al., 1991, p. 149). Rather, we argue that attempts to explain human behavior that ignore this fear neglect an extremely important aspect of the human condition and are thus fundamentally incomplete. In a related vein, we never claimed that TMT explains *everything* that needs to be known about *anything*; rather, we argue that TMT sheds important new light on crucial aspects of most of what people think, feel, and do. For this reason, we designed TMT with an eye toward interfacing with other social psychological theory and research.

p0030 We begin this chapter marking the 30th anniversary of the initial publication of TMT (Greenberg et al., 1986) with this brief overview of the concerns and goals that fueled the development of the theory as a prelude to an assessment of the current state of the theory, which is our primary aim here. How well has the theoretical and empirical work derived from TMT over the past three decades addressed these concerns and met the goals we set for it? More importantly, how well does the theory do what theories are supposed to do? Does TMT provide a useful way of integrating findings across diverse literatures in social psychology? Does it shed new light on these issues and direct us to new phenomena not apparent from the perspective of other theories? Does it serve a generative function and suggest novel directions for both empirical research and conceptual refinement? Does it suggest potentially useful ways of addressing important individual and societal problems?

p0035 Toward these ends, we start with an overview of the theory and a very brief review of the empirical evidence for its fundamental propositions. We then consider a series of distinct conceptual extensions that have emerged from the theory's core propositions to interface with other theory and research to explain: (1) the cognitive and motivational mechanisms through which awareness of death affects human thought and action; (2) the development of terror management processes and the anxiety-buffering system over the course of childhood and individual life spans; (3) the evolution of human mind and culture; (4) how these processes affect the way human beings relate to their bodies and the rest of the natural world; and (5) the role that mismanagement of existential terror plays in psychological dysfunction. We then consider the most important and influential critiques of TMT and alternative explanations for our research findings. Finally, we close with a consideration of some of the most important questions that have emerged from the first 30 years of TMT research that we think are especially important for furthering our understanding of these issues.

s0010

2. THE INTELLECTUAL ROOTS OF TERROR MANAGEMENT THEORY

p0040 TMT was initially inspired by Becker (1973), a cultural anthropologist whose life work centered on integrating and synthesizing what he believed were the most important ideas and insights afforded by diverse scholarly traditions focused on understanding human nature. He drew heavily from psychology, psychoanalysis, existential philosophy, sociology, anthropology, and the humanities to propose what he hoped would become a "general science of man." Becker was especially influenced by the work of Otto Rank, Sigmund Freud, Gregory Zilborg, Norman Brown, William James, Erich Fromm, George Herbert Mead, Robert Jay Lifton, Erving Goffman, Søren Kierkegaard, and Friedrich Nietzsche, all thinkers whose ideas have made essential contributions to understanding human nature, but were generally viewed as difficult to test empirically and therefore given little attention within scientific psychology. We were struck, however, by the relevance of their thinking to the issues that we and other social psychologists were focused on and to the many social problems that people have faced throughout history that continued to be pressing issues for contemporary society. Consequently, we thought it would be worthwhile to try to incorporate these ideas within contemporary social psychological discourse.

p0045 This led to our initial presentation of TMT in a chapter reviewing the empirical literature on the need for self-esteem and its influence on diverse aspects of human behavior (Greenberg et al., 1986). In addition to providing a simple explanation of what self-esteem is, Becker's work addressed the previously unasked question of *why* people need self-esteem. Following Becker, TMT defined self-esteem as the individual's assessment of the extent to which he or she was living up to the standards of value associated with the cultural worldview to which he or she subscribed, and posited that self-esteem functions to buffer the anxiety that results from awareness of the inevitability of death.

p0050 Our initial goals for this paper were to: (1) argue that addressing the question of why people need self-esteem is imperative for understanding an undeniably important aspect of human nature; (2) propose a plausible and provocative answer to this question; and (3) assert that awareness of the inevitability of death has a profound influence on many aspects of life. We also hoped to remind fellow social psychologists that there was a long history of scholarly work in psychology and other disciplines that offered valuable

insights that ought not be ignored if our discipline is to be a truly cumulative and progressive enterprise. Moreover, we realized that recent methodological developments within experimental psychology could be deployed to test hypotheses derived from TMT and other ideas that previous generations of psychologists had deemed untestable. We also realized that recent developments within the field of social psychology fit well with these ideas and could shed new light on them that would facilitate their further refinement and specification. This instigated a program of research and theory development that has kept us and many others busy over the past 30 years.

3. FUNDAMENTAL PROPOSITIONS OF TERROR MANAGEMENT THEORY

p0055 Although most psychological perspectives emphasize either the similarities (e.g., evolutionary and behavioral theories) or differences (e.g., cognitive and humanistic theories) between human beings and other animals, TMT focuses on the interplay between these similarities and differences. Although humankind shares many evolutionary adaptations with other species, including diverse bodily and motivational systems that ultimately function to keep us alive, our capacity for symbolic and abstract thought make us different from all other living entities. Such sophisticated intelligence is adaptive because it increases behavioral flexibility and helps us solve diverse challenges; however, it also inevitably makes human beings realize that they will someday die, and that death can come at any time for any number of unpredictable and uncontrollable reasons. TMT posits that awareness of death in an animal designed by natural selection to avoid premature termination creates the potential for intense primal fear, which we refer to as *terror* to underscore its potency and connection to death. This potential for terror in response to awareness of a basic fact of life would seriously impede successful goal-directed behavior and perhaps survival itself unless effectively managed. Although fear in response to proximal threats to survival has obvious adaptive value in facilitating behavior that averts death, terror in response to awareness of the long-term inevitability of an inescapable fate is another matter—and the focal problem addressed by TMT.

p0060 People use the same intellectual abilities that give rise to their awareness of the inevitability of death to manage their potential for terror with ideas, beliefs, values, and concepts. Specifically, they invent, absorb, and cling to *cultural worldviews*, which are sets of ideas that provide: (1) a theory of reality

that gives life meaning, purpose, and significance; (2) standards by which human behavior can be assessed and have value; and (3) the hope of literal or symbolic immortality to those who believe in and live up to the standards of their cultural worldview. *Literal immortality* entails believing that one will continue to exist after death, usually in a form that transcends the limitations of the physical bodies we inhabit. It typically reflects the religious aspects of cultural worldviews, which promise heaven, reincarnation, or the myriad other types of afterlives that people have aspired to since the earliest days of our species. *Symbolic immortality* entails being part of something greater than oneself that continues to exist after one's own death and on into eternity. People acquire symbolic immortality by being valued contributors to the worlds in which they live and leaving reminders that they were here, such as families, fortunes, monuments, or anything else that persists after they are gone, whether tangible (e.g., books, pictures, music) or intangible (e.g., memories, histories, ideas).

p0065 Qualifying for either literal or symbolic immortality requires that people maintain faith in their cultural worldviews and live up to the standards of value that are part of them. Doing so provides the sense that one is a valuable participant in a meaningful universe, which is the essence of self-esteem. Uncertainty regarding the validity of one's worldview or one's value within the context of the standards it provides undermines the efficacy of these psychological structures as a shield against existential terror. And because there are many possible ways of understanding reality and there are rarely objective metrics of how well one is meeting cultural standards, people require consensual validation of their worldviews and self-esteem from others to effectively buffer anxiety. Others who share one's worldview or evaluate one positively increase this certainty, but others with different worldviews or who evaluate one negatively decrease this certainty. Consequently, people are motivated to seek consensual validation of their worldviews from others and avoid or dismiss any disconfirmation of these structures that may come their way. The power of consensual validation depends on the value of the others whose worldview and evaluations impinge on us. Accordingly, people exaggerate the value of those who share their worldview or who provide positive evaluations and denigrate the value of those with diverging worldviews or who provide negative evaluations.

p0070 Although there are other elements of the theory that address how this dual component (i.e., cultural worldview and self-esteem) anxiety-buffering system develops and functions, these are its core propositions. Over the years, a variety of theoretical modules regarding specific aspects of these

processes have emerged that we believe elucidate the evolution, development, and functioning of the anxiety-buffering system. We discuss these developments in a later section of this paper in which we promote the utility of conceptual interconnectedness across theories. But first we present empirical evidence for the theory's fundamental propositions. This research provided initial support for the viability of the theory and posed questions that led to theoretical refinements and the emergence of some of the theoretical modules to be discussed later.

4. RESEARCH ON THE FUNDAMENTAL PROPOSITIONS OF TERROR MANAGEMENT THEORY

p0075 Our research strategy for assessing the empirical validity of TMT follows the time-honored tradition of logically deducing hypotheses from the theory and subjecting them to experimental tests. As with most theories, no single hypothesis captures the entirety of the phenomena that TMT seeks to explain or the processes it posits. Therefore, we rely on a set of distinct logical deductions from the theory that yield hypotheses that converge on the core ideas to evaluate the theory's fit with empirical reality. These "building block" hypotheses have been combined with each other to yield more complex predictions that further enhance the convergence across distinct deductions from the theory. Although the fundamental propositions of TMT are relatively simple, they entail claims that involve processes that are involved in many diverse forms of behavior. Thus, our strategy was to test the hypotheses derived from the theory by applying them to a correspondingly diverse range of behavioral domains. Support for these hypotheses has been highly consistent across these domains.

4.1 Anxiety-Buffer Hypothesis

p0080 One of the most straightforward implications of TMT is that if a psychological structure serves an anxiety-buffering function, then increasing the strength of that entity should reduce anxiety in threatening situations. When we embarked on this research, studies had already shown that self-esteem was negatively correlated with anxiety (for a review, see Greenberg et al., 1986), threats to self-esteem increase anxiety and negative affect (e.g., Burish & Houston, 1979), and defending self-esteem reduces anxiety produced by self-esteem threats (McFarland & Ross, 1982). But TMT posits that self-esteem is a general anxiety buffer, so the effects of enhancing it

should extend to threats in other domains unrelated to the one in which self-esteem is damaged. In particular, elevated self-esteem should reduce anxiety related to thoughts of death.

p0085 In the initial test of the anxiety-buffer hypothesis, Greenberg, Simon, Pyszczynski, Solomon, and Chatel (1992) randomly assigned participants to receive positive or neutral feedback on a personality inventory to increase their self-esteem or leave it unaltered, respectively; manipulation checks confirmed that it did. They then viewed a video clip of graphic depictions of death or a neutral film. Whereas neutral self-esteem participants showed a significant increase in self-reported anxiety in response to the death-related video, those who received a self-esteem boost did not. A follow-up study with different manipulations of self-esteem (high scores on a supposed IQ test) and threat (anticipating painful electric shocks) showed the same effect on galvanic skin response, a physiological measure of autonomic arousal associated with anxiety.[2] Subsequent studies demonstrated that both manipulated and chronically high levels of self-esteem mitigated defensive reactions to reminders of death (e.g., Greenberg et al., 1993). Taken together, these studies confirm that self-esteem does indeed buffer anxiety and that this effect extends beyond self-esteem-related threats.

s0030 4.2 Mortality Salience Hypothesis

p0090 Far and away the most oft-tested implication of TMT is that reminders of death (mortality salience, MS) should increase one's need for the protection provided by one's worldview, self-esteem, and close attachments and therefore increase one's commitment to or striving for them. Consequently, MS is predicted to lead to more positive responses to anyone or anything that bolsters them and more negative responses to anyone or anything that threatens them. Support for this hypothesis comes from studies showing that MS increases motivation to enhance and defend diverse aspects of these components of the cultural anxiety buffer. A now 5-year-old meta-analytic review of 277 studies concluded that this is a moderate to strong effect ($r^2 = 0.35$) that is among the top 20% of the strongest effects in the field of social psychology (Burke, Martens, & Faucher, 2010). This burgeoning

np0010 [2] We used threat of electric shock because of its independence from threat to self-esteem and its compatibility with a procedure that allowed us to measure a physiological indicator of anxiety. But we should note that although the threat of being shocked may indeed conjure the threat of possible death, it may also raise a fear of pain. Because our developmental analysis posits self-esteem as a general source of protection, we consider it an open question whether it is a general anxiety-buffer that extends beyond direct threats of death and to terror management resources.

literature is so large that we can provide only a few illustrative examples here. MS increases: worldview defense in the form of harsher punishment for moral transgressors (e.g., Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989); more positive evaluations of those who praise one's culture and more negative evaluations of those who criticize it (e.g., Greenberg et al., 1990); greater in-group bias (e.g., Castano, Yzerbyt, Paladino, & Sacchi, 2002); less aggression toward those who share one's worldview and more aggression toward those with worldviews different from one's own (e.g., McGregor et al., 1998); greater support for violent solutions to ethnic, religious, and international conflicts (e.g., Hirschberger & Ein-Dor, 2006; Pyszczynski, Abdollahi, Solomon, Greenberg, & Weise, 2006); increased anxiety when handling cultural icons in a disrespectful way (e.g., Greenberg, Simon, Porteus, Pyszczynski, & Solomon, 1995); more positive evaluations of essays that argue that humans are different from other animals and more negative evaluations of essays that argue that humans are similar to other animals (e.g., Goldenberg et al., 2001); and increased preference for well-structured information and greater dislike for poorly structured information (e.g., Landau, Greenberg, & Solomon, 2004). MS also increases self-esteem striving in the form of increased self-serving attributional biases (e.g., Mikulincer & Florian, 2002); effort and risk taking on activities that are central to one's self-esteem (e.g., Taubman-Ben-Ari, Florian, & Mikulincer, 1999; Peters, Greenberg, Williams, & Schneider, 2005); desire for fame (e.g., Greenberg, Kosloff, Solomon, Cohen, & Landau, 2010); preferences for self-esteem enhancing romantic partners (e.g., Kosloff, Greenberg, Sullivan, & Weise, 2010); and behavior in line with both chronic and situationally primed standards (e.g., Rothschild, Abdollahi, & Pyszczynski, 2009). MS increases attachment motivation, as indicated by: greater attraction to romantic partners (e.g., Mikulincer, Florian, & Hirschberger, 2003); greater willingness to instigate social interactions (e.g., Taubman-Ben-Ari, Findler, & Mikulincer, 2002); increased desire for intimacy in romantic relationships (e.g., Mikulincer & Florian, 2000); more positive associations with one's parents (e.g., Cox et al., 2008, Studies 4 and 5); greater desire for children (e.g., Wisman & Goldenberg, 2005); and larger allocation of resources to maintain contact with attachment figures (e.g., Cox et al., 2008, Study 6).

s0035 ## 4.3 Death Thought Accessibility Hypothesis I

p0095 It also follows from the theory that threats to any component of a person's anxiety buffer should increase the accessibility of death-related thoughts.

Threats to worldviews, self-esteem, and close attachments increase the number of incomplete word stems completed in death-related ways and reduce latencies for recognizing death-related words but not other negative or neutral words on a linguistic decision task (e.g., Hayes, Schimel, Faucher, & Williams, 2008). Moreover, the same conditions that increase death thought accessibility (DTA) also increase defense of one's worldview and striving for self-esteem and close attachments (e.g., Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994). Defending one's worldview, bolstering one's self-esteem, or thinking about attachment figures decreases DTA (Harmon-Jones et al., 1997). The DTA literature is also quite substantial and had reached over 80 studies back in 2010 (see Hayes, Schimel, Arndt, & Faucher, 2010).

s0040 4.4 Combining the Hypotheses

p0100 Various combinations of these three core hypotheses have also been tested. For example, affirming one's self-esteem, worldview, or attachments eliminates the increase in DTA and defense of other anxiety-buffer components that MS produces in the absence of such affirmation (e.g., Arndt, Greenberg, Pyszczynski, & Solomon, 1997; Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997; Harmon-Jones et al., 1997). Giving participants supposed evidence supporting the existence of an afterlife eliminates the effect of MS on both worldview defense and self-esteem striving (Dechesne et al., 2003), and affirming one's religious faith has similar effects among those with an intrinsic religious orientation (Jonas & Fischer, 2006). This body of research documents the dynamic relation between DTA and the various components of the anxiety buffer posited by TMT.

s0045 5. TERROR MANAGEMENT THEORY AND CONCEPTUAL INTERCONNECTIONS

p0105 As empirical support for the theory's fundamental propositions grew and we examined an expanding array of phenomena from a TMT perspective, important questions arose that took us considerably beyond the core ideas. What are the finer grained processes through which death-related thoughts lead people to think, feel, and behave as they do? Considering that young children are clearly not capable of conceptualizing death, how does the anxiety-buffering system develop in early childhood and across the life span? How do death-related anxiety and the mechanisms that manage it interact with motive systems that produce growth, development, and

self-expansion? How did awareness of death, which TMT posits as a central turning point in the evolution of our species, affect the evolution of mind and culture? How do cultural concepts of mind and soul relate to physical bodies? What produces variability in the content and effectiveness of the worldviews and standards of value that people use to manage their anxiety? What happens when the anxiety-buffering system breaks down? The fact that the theory led to these and many other questions, along with plausible and testable potential answers to them, is testament to its generative power.

p0110 These questions led to theoretical refinements, which led to conceptual interfaces with other theories and research, both within social psychology and beyond. Although these conceptual refinements were developed with an eye toward compatibility with both the core propositions of the theory and knowledge from other domains of psychology and related disciplines, they each dealt with unique processes and, to some extent, are independent of each other. We believe that conceptual interconnectedness across theoretical constructions is a useful way of promoting integration across research domains toward a more complete understanding of human behavior. Conceptual interconnectivity is also likely to increase the generative power of a theory, in that advances in understanding often come from focusing on the intersection of differing ideas and phenomena. The ultimate explanatory power of a theory can be best appreciated by considering the entire explanatory network with which it interfaces.

p0115 Because TMT was initially developed as an attempt to understand the roots of many of the motives that other theories use as a point of departure (e.g., self-esteem, meaning, belonging), it was important that it could effectively interface with other theories that addressed these and related phenomena. Over the years, research has been conducted that used TMT to build on ideas from many other theories, including social identity theory (e.g., Castano et al., 2002), cognitive dissonance theory (e.g., Jonas, Greenberg, & Frey, 2003), optimal distinctiveness theory (e.g., Simon et al., 1997), objective self-awareness theory (e.g., Arndt, Greenberg, Simon, Pyszczynski, & Solomon, 1998), just world theory (e.g., Hirschberger, 2006), objectification theory (Goldenberg, McCoy, Pyszczynski, Greenberg, & Solomon, 2000), self-determination theory (e.g., Vail, Arndt, Motyl, & Pyszczynski, 2012; Vail, Juhl, et al., 2012), ironic process theory (e.g., Arndt, Greenberg, Solomon, et al., 1997), reactance theory (e.g., Solomon, Pyszczynski, & Greenberg, 2004), attribution theory (e.g., Mikulincer & Florian, 2002), balance theory (e.g., Landau et al., 2004), ego depletion theory (e.g., Gailliot, Schmeichel, & Baumeister, 2006), and

lay epistemology theory (e.g., Dechesne & Kruglanski, 2004). Indeed, even the staunchest critics of TMT seem to have constructed their alternative accounts using essential elements of TMT, including the concept of worldview defense and importance of time passing between threat induction and defense assessment (e.g., McGregor, Zanna, Holmes, & Spencer, 2001; van den Bos & Miedema, 2000).

p0120 We now turn to a discussion of what we view as the most central conceptual interfaces that have emerged regarding TMT-related issues.

s0050 5.1 Psychological Mechanisms Through Which Thoughts of Death Affect Behavior

p0125 Initial tests of terror management hypotheses produced consistently supportive results, showing that boosting self-esteem reduced anxiety and anxiety-related behavior (Greenberg et al., 1992, 1993) and that reminders of mortality led to harsher evaluation of moral transgressors (Rosenblatt et al., 1989), greater in-group bias (Greenberg et al., 1990), and more negative evaluations of those who criticized one's culture and more positive evaluations of those who praised it (Greenberg et al., 1990). But soon after our initial findings were published, German psychologist Randolph Ochsmann contacted us to report that he was unable to replicate the MS effect. After consulting about the details of the procedures he was using, it became apparent that his MS induction was much more intensive than ours. When he tried the study again with the simpler MS induction we had been using, he replicated the effects of MS on evaluations of moral transgressors and found that they generalized to other types of transgressions beyond the effects of evaluations of a prostitute that we had reported (Ochsmann & Mathy, 1994).

p0130 These observations led us to suspect that, contrary to the usual dose–response relationship, milder MS inductions might produce stronger effects than more intensive ones. This was confirmed in a study that directly compared the two open-ended questions about death we had been using with a more intensive induction in which, after answering our two questions about death, participants were asked to vividly imagine they were on their deathbed, with only a few days remaining to live (Greenberg et al., 1994). Whereas the milder MS induction produced the usual effect on worldview defense, the more intensive one did not.

p0135 Though initially puzzling, this pattern of results shed a glimmer of light on some troublesome inconsistencies in results from our own research: whereas studies conducted by one of us yielded very consistent MS effects,

those conducted by another did not. Looking more carefully at the details of these studies, we realized that all of the successful MS effects came from studies in which substantial intervening tasks (filler or affect measures and experimental instructions) were placed between the MS manipulation and the dependent variable; but when the dependent variable was assessed immediately after the MS manipulation, significant effects were not found. This raised the possibility that when people are actively contemplating the problem of death, they do not cling to their worldviews—and made us wonder what else they might be doing to cope with death under such conditions. This led to studies comparing the immediate and delayed effects of MS, which showed that worldview defense occurred only when a delay and distraction separated the MS manipulation and assessment of defensive responses (Greenberg et al., 1994, Studies 2 and 3). But why would a delay between MS induction and worldview defense assessment be needed for these effects to emerge—and what were people doing immediately after being reminded of their mortality?

p0140 These questions led to the development of the dual defense model that posits distinct defensive tactics for coping with thoughts of death when they are in current focal attention and when they are on the fringes of consciousness—highly accessible but not in current focal attention (Pyszczynski, Greenberg, & Solomon, 1999). We reasoned that when thoughts of death are in focal attention, people might cope with them in a seemingly rational manner that "makes sense" and directly addresses the problem. For example, when consciously thinking about death, people deny their vulnerability, exaggerate their health and hardiness, or simply suppress such thoughts. This enables them to convince themselves that death is a problem for the distant future and of little relevance to them now. We refer to these as *proximal defenses* because their content is logically related to the problem of death and addresses this threat directly.

p0145 Proximal defenses remove death thoughts from focal attention but do nothing to negate the fact that death is our inevitable fate. The fact that we will someday die is a bit of declarative knowledge, similar to our address or phone number—something that rarely occupies conscious attention but can easily and quickly be brought to mind. Such thoughts linger on the fringes of consciousness, in a state of high accessibility, always ready to enter consciousness (Wegner, 1994). People push these implicit thoughts further away from consciousness with *distal defenses* that entail viewing themselves as valuable contributors to a meaningful world; these distal defenses are the core components of the anxiety-buffering system specified by TMT. They

prevent death-related thoughts from entering conscious attention by reducing their accessibility before they can reach consciousness.

p0150 The idea that worldview defense and self-esteem striving occur when thoughts of death are outside of conscious attention explains why people have little or no awareness of these processes and why many people are able to honestly say that they rarely think about death. When thoughts of mortality enter consciousness, people push the problem into the distant future by convincing themselves of their health and hardiness or simply suppressing such thoughts by seeking distractions (Wegner, 1994). Once these thoughts are banished from consciousness and people are no longer aware of them, the suppression is relaxed, which makes it possible for these thoughts to become more accessible. But they then activate distal defenses to reduce the accessibility of these thoughts and further reduce the likelihood that they will enter consciousness. The greater the accessibility of death-related thoughts outside of conscious awareness, the more vigorous the distal defenses. Thus, proximal and distal defenses work together to keep death thoughts out of consciousness and keep people unaware of the influence that they exert from the fringes of consciousness. This, in turn, enables them to maintain an illusion of objectivity and rationality about their thoughts and feelings (Pyszczynski & Greenberg, 1987) and be unaware of the role these defensive processes play in protecting them from the problem of death.

p0155 A large and growing body of evidence supports the dual defense model. Whereas the distal defenses of clinging to one's worldview and self-esteem striving emerge only when there is a delay and distraction separating the death reminder and assessment of defensive responses, the proximal defenses of denying one's vulnerability and suppressing death-related thoughts emerge immediately after death reminders (e.g., Arndt, Greenberg, Pyszczynski, et al., 1997; Arndt, Greenberg, Solomon, et al., 1997; Greenberg, Arndt, Simon, Pyszczynski, & Solomon, 2000). The two exceptions are that distal defenses occur immediately after *subliminal* death reminders or if cognitive load is high during the MS induction (Arndt, Greenberg, Pyszczynski, et al., 1997; Arndt, Greenberg, Solomon, et al., 1997); this provides further evidence that these defenses emerge when thoughts of death are accessible but not in conscious attention. Research also shows that threats to one's worldview, self-esteem, and attachments increase DTA (for a review, see Hayes et al., 2010). Importantly, stimuli that increase death thought accessibility increase commitment to one's worldview and self-esteem striving, which in turn reduces death thought accessibility to baseline levels (e.g., Arndt, Greenberg, Pyszczynski, et al., 1997;

Harmon-Jones et al., 1997). Although we generally avoid assessing both death thought accessibility and worldview defense in the same study because of the possibility that the DTA assessment would prime thoughts of death and thus contaminate control participants, several recent studies have done this and shown that DTA mediates the relation between MS and worldview defense (e.g., Das, Bushman, Bezemer, Kerkhof, & Cermeulen, 2009). MS also increases the accessibility of concepts that are central to one's worldview and thus especially useful for defusing the threat of death (Arndt, Greenberg, & Cook, 2002).

p0160 Support for the dual defense model has been obtained across a diverse range of applications of TMT, particularly in research inspired by the Terror Management Theory Health Model (TMTHM; Goldenberg & Arndt, 2008), which posits that people generally respond in health-promoting ways via proximal defenses immediately after death reminders but in self-esteem enhancing and cultural worldview bolstering ways via distal defenses after being distracted from thoughts of death. For example, in one study, participants chose a more protective sunscreen than controls immediately after a death reminder (presumably to protect themselves from skin cancer), but if there was a delay after the reminder, people who value a tan as a basis of self-worth chose a less protective one. For a more comprehensive review of the literatures on the dual defense model and TMTHM, see Goldenberg and Arndt (2008).

p0165 Recent studies suggest that there may be other ways people cope with their fear of death in addition to the particular proximal and distal defenses specified by TMT and the dual process model. DeWall and Baumeister (2007) showed that reminders of death increase attention to positive affect, presumably to counteract the anxiety that could otherwise arise; specifically, MS increased completions of word stems with positively valenced affective words and marginally decreased completions with negatively valenced affective words. In a related vein, MacDonald and Lipp (2008) found that MS produced a significant reduction in the attentional bias for fear-relevant stimuli that was obtained in the absence of MS. Research also suggests that alcohol and other drugs may sometimes serve a terror management function. Ein-Dor et al. (2014) showed that a death reminder increased the likelihood of participants consuming an alcoholic beverage shortly thereafter, and Chatard and Selimbegović (2011) and Nagar and Rabinovitz (in press) showed that MS increased cannabis users' desire to get high and that cannabis use reduced the accessibility of death-related thoughts. These responses all seem to fit within the category of proximal defenses that likely divert

attention from these troubling thoughts. However, they could also be distal defenses because alcohol and drug consumption can serve as sources of self-worth for some people in certain social contexts. Clearly, these and other possible ways of coping with thoughts of death merit further exploration.

p0170 Somewhat surprisingly, the MS inductions used in TMT research do not typically produce measureable signs of anxiety, distress, or negative affect. When we designed the first MS study, we gave little thought to whether healthy young adults writing about death in the safety of our labs would consciously experience fear. On the one hand, fear of death is the central motivating force in the theory. On the other hand, Becker posited that this fear is largely unconscious, and people have presumably spent their lives investing in cultural worldviews and striving for self-esteem to minimize their experience of that fear. Our first six MS studies showed no hint of either elevated self-reports of fear or anxiety and no increase in autonomic or cardiovascular indicators of arousal. Hundreds of studies have subsequently similarly failed to find an impact of MS on self-reported affect relative to various control conditions; one study (Arndt, Allen, & Greenberg, 2001) found a small increase in corrugator activity during subliminal presentation of death primes, but it didn't persist beyond the primes, and this activation did not mediate the increased worldview defense the death primes produced.

p0175 Of course, encounters with death often do produce strong emotional reactions. Threat of immanent death from disease, violence, or airplane turbulence can quickly generate feelings of terror and palpable signs of physiological arousal. Even healthy people sometimes awaken in the safety of their bedrooms terrified by dreams or ruminations about their inevitable fate. The consistent finding that our MS induction did not produce negative affect but did increase worldview defense and self-esteem striving led us to posit that these and other relatively subtle death reminders produce a *potential* for anxiety or negative affect that is quickly averted by the activation of terror management defenses. This lack of consciously experienced affect in the many studies demonstrating that MS increased worldview defense was one of the findings that led us to infer that responses to MS were not simply the result of negative affect or anxiety that any unpleasant event could produce. Indeed, in the first of many studies directly comparing the effect of MS with reminders of other aversive events, we found that whereas thoughts of taking an important exam or worries about life after college produced significant increases in negative affect but no increase in worldview defense, thoughts of death did not increase negative affect but did increase worldview defense;

this research also found that negative affect in response to MS was associated with lower rather than higher levels of worldview defense (−0.50; Greenberg et al., 1995).

p0180 Greenberg et al. (2003) provided more direct evidence for the proposition that it is the potential for anxiety rather than consciously experienced anxiety that drives MS effects by showing that giving participants a placebo believed to block the experience of anxiety for an hour eliminated the MS effect (measured within the hour) obtained in the absence of this placebo. In other words, if participants didn't believe they could get anxious, they had no need to bolster faith in their worldview in response to MS. If actual arousal or anxiety was driving the increased worldview defense that MS produced, the misattribution of arousal literature (e.g., Storms & Nisbett, 1970) suggests that these instructions might have led to *increased* defensiveness, similar to what has been found in many previous studies in which participants who are experiencing arousal were told that a placebo pill would make them feel relaxed, which increased their subjective experience of emotion (e.g., Zanna & Cooper, 1974). These ideas fit the general view that many behaviors, including psychological defenses, are motivated not by the direct experience of affect, but rather the anticipation of that affect (e.g., Baumeister, Vohs, DeWall, & Zhang, 2007; Erdelyi & Goldberg, 1979).

p0185 Lambert et al. (2014) recently reported four studies that did detect increased affect in response to an MS induction using a more refined measure of fear rather than general negative affect, consisting of a subset of items from the PANAS (fearful, afraid, scared, frightened). They also showed that this increased fear mediated a *decrease* in self-esteem in response to MS. It is not clear what to make of these findings in light of the hundreds of studies that did not find a difference in reported general negative affect between MS and control conditions[3] and the fact that *decreased* self-esteem in response to MS runs counter to what would be predicted from TMT and has not been

np0015 [3] Lambert et al. (2014) argue that previous research has not provided a fair test of the possibility that the MS manipulation used in TMT research produces increases in subjectively experienced affect. In addition to arguing that the mostly widely used affect measure in these studies, the PANAS-X, is not specific enough to pick up the subjective fear that they view as the most likely response to thoughts of death, they argue that the large majority of MS studies entail comparison with other aversive events rather than a true neutral control condition. Although this is true of the majority of studies (to respond to reviewer and critic concerns about alternative explanations), over 20 studies have compared MS to neutral controls such as watching television or eating food. In addition, the majority of studies using aversive controls found no differences on affect but differences on the primary dependent variables, which suggests that the differential effects of MS were not the results of differential affective reactions.

found in previous research; TMT predicts that, if anything, MS should *increase* self-esteem striving, which makes this decrease in reported self-esteem difficult to interpret from the perspective of the theory. Their study did show that, as in many previous studies, MS increased worldview defense along with self-reported fear; but, importantly, this increased fear did not mediate worldview defense, much as the small increase in corrugator activity in response to subliminal death primes did not mediate worldview defense in Arndt et al. (2001). It is unclear what if anything these findings imply regarding the processes through which MS increases defensiveness.

p0190 Other recent research has shown that MS leads to activation of brain regions associated with affect, such as the right amygdala, anterior cingulate cortex, and right caudate nucleus (Quirin et al., 2012). Tritt, Inzlicht, and Harmon-Jones (2012) argue that this evidence challenges our conclusion that MS does not produce affect and that affect does not mediate defensive responses to it. But activation of brain regions associated with affect is not the same as the subjective experience of affect. Perhaps MS produces some form of implicit affect, or unconscious signal of impending affect, but that's essentially what we mean by the concept of potential affect. Regardless of what one calls it, though, it makes perfect sense that some sort of neural activation would be involved in signaling the potential for affect. But there is still no evidence that subjectively experienced emotion mediates MS effects. Nonetheless, these recent findings indicate that further research on the role of affect and arousal in MS effects is surely warranted.

p0195 It is important to realize, though, that TMT is not a theory of MS effects *per se*; rather, the MS research is one line of evidence regarding TMT's claims about the role of awareness of death in life. Indeed, the theory is mute as to whether particular reminders of death will or will not arouse measureable subjective affect; presumably this depends on how threatening and intense the death reminders is. Consequently, although it would certainly change our understanding of the mechanisms through which MS effects are produced, the basic theory would not be fundamentally altered or called into question if MS effects were found to be mediated by affect and/or arousal (as some researchers who equate the theory with the MS evidence have implicitly implied or explicitly claimed).

s0055 5.2 Development of the Anxiety-Buffering System

p0200 The fact that children are clearly not aware of death in their earliest years of life, nor are they aware of themselves or capable of the conceptualizing even

the most rudimentary elements of cultural worldviews, raises the question of how awareness of death and the anxiety-buffering capacities of worldviews and self-esteem develop. Our analysis of how children develop the capacity to use beliefs, values, and self-esteem to manage anxiety builds on the work of Otto Rank, Karen Horney, Harry Stack Sullivan, Jean Piaget, Ernest Becker, John Bowlby, and other developmental theorists. The core idea is that these more sophisticated anxiety-buffering capacities develop out of the attachment system that evolved to insure the survival of offspring too immature to survive on their own.

p0205 Human infants are born helpless, unable to meet their own needs, and prone to experience and express distress when those needs are unmet. From the beginning, the child innately fears what could harm and ultimately kill it. These innate fears protect the child from premature death. Parents and caregivers respond to children's distress signals by holding, rocking, and comforting them, while doing what must be done to meet their needs. These interactions produce strong affectional bonds that provide comfort to parent and child alike. As the child's cognitive abilities develop, internal representations of the parent are formed which serve as an additional source of security. Then as the child's behavioral capacities increase, the parents' displays of affection gradually become more contingent on the child's behavior. Whereas in the early months of life, children receive affection from the parents for simply existing, as they become increasingly capable, the parents reserve their more enthusiastic displays of affection for increasingly sophisticated behavior—crawling, walking, simple verbalizations, then phrases, sentences, and behavior that later must comport with the parents' beliefs and values. Through this process, children learn that meeting their parents' versions of their culture's values brings love and protection, whereas falling short of their standards can bring rebukes and apparent withdrawal of affection. In this way, children learn that they are safe when they live up to the parents' standards and are in jeopardy when they fall short of them. Because the parents' values reflect those of the culture at large, the child's emotional well-being soon becomes dependent on living up to the values of the cultural worldview.

p0210 Children subsequently develop awareness of themselves as unique beings with minds and experiences that are distinct from anyone else. They also come to realize that there are limits to their parents' power and ability to protect them, and that their parents, like everyone else, themselves included, are mortal. These unwelcome realizations create a need for a basis of security broader than what the parents can provide by themselves. To help them

cope with their increasing fears, children are taught about deities that make it possible for them and those they love to move on to a better mode of existence when they die. They also learn about secular institutions, their ethnic and religious heritage, their nation, and various other cultural institutions that give life meaning and permanence that they can be part of if they stay in the good graces of others. Through these interactions with their parents, family, clergy, teachers, and peers, they gradually become indoctrinated into the cultural worldview that relieves anxiety by giving meaning to life and value to themselves. Although this security is initially based on the parents' love, it is gradually transferred to the culture at large, and in most cases, the protective providence of the deity and spirit world that is part of the cultural worldview. Thus, what starts as an innate threat management system that protects preverbal children form things that could kill them adds explicit death-denying components as children become more and more aware of death.

p0215 In the one direct empirical evaluation of this developmental account of which we are aware, Florian and Mikulincer (1998a) assessed the effect of responding to a series of questions about death on 7- and 11-year-old Israeli children's attitudes toward other children who were either Israeli or recent immigrants from Russia. The death reminders affected both groups' attitudes toward the other children, but in different ways. Whereas the youngest children's evaluations of both groups became more negative in response to the death reminders, the older children exhibited the typical pattern of worldview defense found among adults: they became more positive in their evaluation of the fellow Israeli children but more negative in their evaluation of the recent immigrants. These findings suggest that the use of in-group favoritism to manage death concerns probably emerges between the ages of 7 and 11.

p0220 Research has also shown that attachment relationships continue to be important sources of existential security long after people have begun using their worldviews and self-esteem for this protection. A large body of evidence documents the use of romantic relationships to manage death fears (for a review, see Mikulincer, Florian, & Hirschberger, 2004). MS increases interest in romantic relationships, willingness to compromise to have them, and expressions of love for one's partner. Thoughts of separation from romantic partners increase DTA, and thoughts of intimacy with one's partner decrease DTA and the worldview defense that thoughts of death otherwise produce. Other research shows that adults continue to use their parents as terror management resources and that parents get protection from death

concerns from their children through the sense of self-worth and symbolic immortality afforded by offspring who continue into future generations (e.g., Cox et al., 2008; Wisman & Goldenberg, 2005).

p0225 But as is clear from the attachment literature, children vary in how securely they bond with their parents and, therefore, in the extent to which they associate security with pleasing their parents and, later, living up to their internalized versions of the cultural worldview. Insecure attachments likely force alternative ways of managing anxiety, which can interfere with their relationships with others, ability to buy into important aspects of the cultural worldview, and obtain security by maintaining a positive self-image. Although most people learn to manage anxiety by maintaining a positive self-image, those with less fortunate childhood experiences may be less able to do so and, therefore, turn to other less adaptive ways of finding security. In some cases, people seem to seek security in a negative self-image. Indeed, there are relatively rare instances where people appear to hope to be remembered for things that they themselves realize are moral atrocities, as documented in the writings of the Columbine High School and Virginia Tech mass murderers, who seemed to want their horrific actions to achieve an ignorable sort of immortality. This suggests that those who feel rejected by others and unable to garner attention for their positive qualities may attempt to leave their mark on perpetuity by dramatically violating cultural values. Perhaps difficulties in the initial development of the capacity to be comforted by close relationships, self-esteem, and culturally shared meanings increase the likelihood of such deviant behavior in later life.

p0230 It also seems clear that many people show developmental changes in the way they cope with death in their later years. We propose that this transition is instigated by the increased proximity to death that is inherent in old age, coupled with the reduced ability to meet the standards through which people maintained self-esteem in their younger years, the changes in dominant worldview promoted by the now dominant younger generation, and the loss of the close relationships (due to death and illness) that were previous bases of security. Older adults are less prone than young persons to respond to MS with harsher judgments of moral transgressors and those who criticize their worldviews (e.g., Maxfield et al., 2007). Instead, older adults are more likely to respond to MS by increasing their prosocial generative concern for future generations (Maxfield et al., 2014). These developmental shifts are most apparent among older adults with high levels of executive functioning (Maxfield, Pyszczynski, Greenberg, Pepin, & Davis, 2011); the finding that older adults with low levels of executive functioning continue to respond to

death reminders the same way younger adults do suggests that intact executive functioning may be necessary to facilitate such changes in how one relates to and copes with the increased proximity to death associated with aging.

s0060 5.3 The Body, Nature, and Physicality

p0235 TMT posits that people cope with knowledge of the inevitability of death by living their lives in a symbolic world of meaning in which they are enduringly significant beings rather than mere animals fated only to obliteration when they die. A major component of most culture's solution to this problem is to imbue life with mind and spirit, an essence that transcends the body and is not dependent on it. This makes it possible to construe ourselves as continuing to exist after our bodies have perished. Because bodies are the clear culprits in death, people identify their selves more with their minds and spirits than with their bodies, which are often viewed as mere containers for the more essential immaterial self.

p0240 Because our physical bodies are a continual reminder of our vulnerability and mortality, we distance ourselves from our animal nature as best we can. An important line of research spearheaded by Jamie Goldenberg (for a review, see Goldenberg, 2012) has demonstrated the many ways people engage in this process. MS increases denial of similarities between humans and other animals, disgust in response to bodily products, distancing from animals and animalistic activities, and even avoidance of physical sensations. MS also increases dislike of nonhuman animals (Beatson & Halloran, 2007) and support for killing them (Lifshin, Greenberg, & Sullivan, 2014), as a way of feeling superior to them. Additionally, DTA is increased when people are reminded of bodily products, disgusting things, and the physical (but not romantic) aspects of sex. These propensities are particularly strong for people high in neuroticism or who have recently been reminded of their similarity to other animals. Recent evidence that MS increases belief in an afterlife primarily among people who are high in mind–body dualism or when dualistic thinking has been experimentally enhanced (Heflick, Goldenberg, Hart, & Kamp, 2015) supports the idea that separating the mind or soul from the body facilitates belief in literal immortality. These diverse lines of research provide converging evidence for the proposition that people distance from their bodies and invest their selves in abstract concepts of mind and spirit because of the undeniable fact that bodies die.

p0245 This tendency to distance from our animal nature helps explain the ambivalence that people feel about sex despite the great potential for

pleasure that it entails. Cultures vary widely in both the content and restrictiveness of their rules regarding sexual conduct. Some restrict sex as something that should occur only between married men and women, in private and in the dark, sometimes through a hole in a sheet, done only for the purpose of procreation. Other cultures encourage sharing sex partners, expressing one's carnal desires whenever and wherever one likes, in whatever way strikes one's fancy, either alone or with others present. However, even the most sexually permissive cultures attach important cultural meaning to sex, making it an expression of transcendent love, a means of spiritual fulfillment, one's duty to replenish the group, or an athletic contest of some sort. Most other theories that address these issues (e.g., Buss, 1984) view sexual ambivalence as the result of innate intuitions and cultural restrictions that evolved to facilitate group harmony and prevent disputes over mates. While not disputing this function, TMT views the universal existence of these cultural norms as attempts to distance ourselves from our animal nature, of which sex is a rather striking reminder.

p0250 This analysis also provides an explanation for the near universal tendency to place greater emphasis on beauty and purity in women than men. This may be due to the more obvious role that women's bodies play in the creaturely activity of reproduction—menstruation, pregnancy, giving birth, and lactation are all creaturely activities that make many people squeamish. Or it could result from the power men have over women in most cultures. Support for these ideas is provided by studies showing that reminders of death or one's creaturely nature increase distancing from and derogation of pregnant, menstruating, breast-feeding, or sexually provocative women (for a review, see Goldenberg, 2012). Other studies have shown that witnessing a woman accidentally drop a tampon from her purse leads both men and women to derogate her and distance from her, while also increasing the importance that they place on the value of physical beauty for women in general (Roberts, Goldenberg, Manly, & Pyzsczynski, 2002). Cultures reduce the threatening nature of reproductive processes by putting women on pedestals, treating them as objects of beauty to be admired, and placing greater value on virginity and purity for women than men. Thus, MS leads to devaluing of women who are overtly sexual but not women who are modestly clothed and wholesomely attractive. For example, in a recent study (Morris & Goldenberg, 2015), MS led men to report lower liking for photos depicting sexually provocative women posed next to physical objects, compared to a non-MS control condition. Interestingly, if these provocative women were objectified (quite literally) by fusing them with the objects,

MS actually led men to report more liking for the photos, compared to a non-MS control condition. Presumably, the objectification reduced the threat of the provocative women, which increased liking under conditions of MS.

s0065 5.4 The Evolution of Mind and Culture

p0255 Although the primary goal of TMT is to explain contemporary psychological functioning, from its earliest incarnations, the theory also provided an analysis of how the awareness of death affected the emergence and content of culture (Solomon et al., 1991, Solomon, Greenberg, Schimel, Arndt, & Pyszczynski, 2004). Thus, like most religions and contemporary evolutionary psychology, TMT provides an "origin story" for humankind—something that the theory posits is appealing because it provides meaning for human existence. The TMT analysis builds on evolutionary theory and is consistent with most variations of this approach, although it adds additional forces that are given little attention by most evolutionary psychologists. Perhaps the biggest point of departure from most, but not all (e.g., Deacon, 1997; Langer, 1967), evolutionary analyses is that TMT draws attention to the importance of the *internal environment of the human mind* as exerting adaptive pressures that affected human nature and culture (Pyszczynski, Sullivan, & Greenberg, 2014). TMT also places greater emphasis on the role of human ingenuity in solving both internal and external adaptive challenges and the impact that these human inventions played in the development of mind and culture.

p0260 Consistent with all evolutionary accounts of the origins of our species, TMT posits that the sophisticated cognitive abilities unique to our species were selected for because they facilitated our ability to survive, reproduce, and care for our young, which ultimately led to the propagation of the genes responsible for these successes into future generations. In particular, these cognitive capabilities increased the flexibility of our ancestors' capacity to respond to the diverse and rapidly changing environments that they inhabited. This culminated in a new form of behavior regulation, in which linguistic concepts of current self and standards of personal value served as monitors that signaled the need to adjust behavior to keep it on track in the pursuit of important goals (Becker, 1971; Carver & Scheier, 1981a, 1981b; Pyszczynski, Greenberg, Solomon, & Hamilton, 1990). Although generally highly adaptive, these sophisticated intellectual capacities made our ancestors aware that death was inevitable, for themselves and for all other

humans, and that death could come at any time for any number of reasons. The juxtaposition of this awareness with the strong desire for life that came with the diverse adaptations that facilitated surviving long enough to reproduce and care for offspring created the potential for terror. Such terror would have seriously impeded effective goal-directed behavior, and eventually reproduction and gene perpetuation, unless effectively managed. Whereas fear in response to clear and present danger is adaptive because it motivates behavior to avert such threats, terror in response to awareness of the long-term inevitability of death has little direct utility because there is nothing that can be done to avoid this fate.

s0070 ### 5.4.1 Gods, Morality, and Death

p0265 TMT posits that our ancestors used the same sophisticated cognitive abilities that gave rise to the problem of terror to create a partial solution to it—they invented ideas that enabled them to live with relative equanimity in spite of their awareness of the inevitability of death. This awareness emerged around the same time our ancestors were using their newfound intelligence to answer questions about how the world works and how to survive and prosper in it with other members of their groups. Beliefs and values that helped minimize their fears were especially appealing and likely to be communicated and spread to others and eventually became institutionalized as cultural knowledge. As cognitive capacities continued to evolve and people became more adept at using them, human life became increasingly dependent on the cultural world of symbols, ideas, and values; this likely influenced the further evolution of the human brain, in that those who were best able to adapt to and prosper in the cultural environments of ideas, values, rules, and deities were more likely to have their genes be propagated into future generations (Baumeister, 2005). Our species was gradually transformed from groups of conspecifics who responded to the challenges of the external environment, to *social animals* that worked together to prosper in the external environment and therefore were forced to adapt to the challenges of living in groups, to *cultural animals* that lived in a world of symbols, words, ideas, and values, populated by spirits and deities, that they themselves invented to ward off their fears.

p0270 Early presentations of TMT did not address the question of where these cultural beliefs and values came from, other than to say they were invented to help manage terror. More recently (e.g., Greenberg et al., 2014; Pyszczynski & Kesebir, 2012), we built on theorists who emphasize the dialectic interplay between natural selection and cultural innovation

(e.g., Deacon, 1997; Haidt & Joseph, 2004; Shweder & Haidt, 1993) to further explicate the content of the beliefs and values that our ancestors invented to assuage their fears. For example, Boyer (2001), Atran (2002), and others have argued that the concept of spirits and deities emerged as a nonadaptive side effect of the evolved human tendency to perceive mental states and agency in other humans. Application of these mind-concepts to other natural phenomena is claimed to be responsible for the emergence of concepts of gods and religions, which themselves are claimed to serve no adaptive function. Others argue that religion emerged to facilitate social cooperation within groups by creating a sense of fictive kinship (e.g., Bering, 2006). Although these views are sometimes presented as alternatives to the view that religion functions to manage death-related fear (e.g., Kirkpatrick & Navarrete, 2006), we view them as complementary to the TMT analysis. Concepts of spirits and deities may have indeed initially emerged as our ancestors applied cognitive tools that had evolved to facilitate social interaction to help them understand the workings of what we now view as the nonpersonal forces of nature. As awareness of death emerged, these primitive intuitions and concepts were then used as the building blocks for the more complex death-denying beliefs about deities and spirits that became central to culture. Because spiritual entities could not be directly observed, people relied on the shared beliefs of others within their group to validate their belief in them. This shared need for validation of their belief in invisible entities that protected people from existential fears encouraged people to congregate in groups, engage in shared rituals, and build tangible monuments to the gods that they created. Consistent with these ideas, research has shown that reminders of death increase belief in deities, spirits, and an afterlife (for a review, see Vail et al., 2010), as well as estimates of social consensus for one's attitudes (Pyszczynski et al., 1996).

p0275 Experiential knowledge that resulted from parent–child and other person-to-person interactions was another likely source of inspiration for the content of religious beliefs. As discussed in Section 5.2, children's initial protection from distress and fear comes from meeting the wishes of their seemingly omnipotent parents. Experiences such as these may have inspired initial conceptualizations of even more powerful deities and how to procure and maintain their protection. The idea that God is an attachment figure that substitutes for our parents has been suggested by scholars of varying theoretical orientations over the years (e.g., Freud, 1930; Kirkpatrick, 2005). Viewing socialization experiences with parents who guarded our well-being in our early years as providing intuitive inspiration for the cultural innovation

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of omnipotent gods who control access to the afterlife helps explain the specific characteristics of the deities that cultures created. Perhaps some of the variability of conceptions of gods across cultures and historical epochs reflects differences in parenting practices—and this variability in concepts of gods likely influenced later cultural values regarding optimal parenting.

p0280 Another likely source of inspiration for the images of deities that our ancestors created may have been other powerful figures with whom they interacted, such as chiefs, shamans, and kings, who likely enjoyed the fawning fealty that many religions assume their deities similarly require from their followers. This helps explain the despotic, egotistical, and occasionally benevolent character attributed to the various gods that have populated human cultural history. As Wright (2009) suggested, religious conceptions often reflect social and political realities that people were facing at the time, with vengeful gods emerging during times of conflict and more benevolent ones flourishing during times of peace, when cooperation and commerce between different tribes were needed. As Feurbach (1841/1989) put it, "Man created God in his own image."

p0285 The central point of the TMT analysis of the evolution of mind and culture is that the emergence of awareness of the inevitability of death was the cataclysmic problem that brought the experiential world of our prehuman ancestors into play as grist for the solutions to existential problems developed by the inquisitive minds of our newly emerging species. From this point on, explanations for how the world works that helped assuage death-related fears had a distinct advantage and became increasingly popular. The fear of death and corresponding hope for immortality had a powerful influence on the sorts of beliefs and values that people sought. Before this point, explanations for how the world works that were effective in meeting people's tangible needs for food, water, warmth, and safety from predators and rival bands of humans were most desirable and adaptive. Moral and social structures functioned primarily to preserve peace within the group and facilitate dominance over other groups; this is the essence of the explanations for the ongoing function of morality and religion proffered by most contemporary theories (e.g., Bering, 2006; Graham et al., 2013; Norenzayen et al., in press). While not disputing these accounts of the earlier precursors to contemporary morality and religion, TMT adds that emerging awareness of death altered the psychological landscape such that beliefs and values that were effective in managing existential terror gained a distinct advantage. Morality, which initially functioned to keep one in the good graces of others, now became the primary basis for admission to the afterlife.

p0290 Consistent with this view, MS increases behavior and attitudes in line with all five of the moral intuitions posited by Moral Foundations Theory (Haidt & Joseph, 2004): fairness, harm, loyalty, authority, and sanctity (for a review, see Pyszczynski & Kesebir, 2012). Other research (Bassett, Van Tongeren, Green, Sonntag, & Kilpatrick, 2014) has shown that MS polarizes moral judgments, exaggerating the differences typically found between conservatives and liberals (e.g., Graham, Haidt, & Nosek, 2009). Additionally, priming the concept of god, which TMT posits is the prepotent line of existential defense for many people, increases charitable giving and benevolent judgments of others and decreases cheating (for a review, see Norenzayan et al., in press). From the perspective of TMT, thoughts of one's deity increase morality by activating efforts to defeat death by qualifying for the literal immortality that is believed to depend on staying in the deity's good graces by behaving in a moral manner.

p0295 Continuing cognitive evolution probably accelerated the pace at which cultural knowledge was created and codified, which in turn likely created further adaptive advantage for brain structures that promoted sophisticated intellectual abilities. With increasing civilization, scholarly, scientific, and religious traditions (which for most of human history were the same thing) expanded in varying directions. As these intellectual traditions increased in influence, the ideas, beliefs, narratives, and values that constituted cultural worldviews came under increasing scrutiny, and pressures to make the many pieces of the puzzle fit together increased. Thus, elaborate cosmologies emerged that tried to explain everything—usually by invoking an all-knowing all-powerful deity who created the universe and whose desires and dictates became the ultimate answer to all questions. Why are we here? Because the gods wanted us and therefore created us! What should we do? Whatever the gods want us to do! Why? In order to attain everlasting life and avoid eternal damnation. Thus, the cultural revolution of 40,000 years ago likely involved a gradual shift in the motives that drove human behavior, especially those involving morality, from staying in the good graces of other humans to transcending death.

p0300 The idea that experiential knowledge gleaned from socialization and interactions with others inspired the kinds of gods that cultures created may help explain the parallels between the literal and symbolic modes of immortality that we have often noticed over the years but not explicitly discussed in previous presentations of TMT. The two modes of immortality may have built on and influenced each other over thousands of years of cultural evolution, such that qualifying for either requires the same things: faith

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in the cultural worldview and heroically exemplifying its standards. Just as most religions teach that literal immortality in the form of a blissful afterlife is granted to those who believe in their teachings and live up to their value, the hope of symbolic immortality typically depends on leaving a lasting positive contribution to one's culture that will be remembered long after one dies.

s0075 5.5 Terror Management and Psychological Disorder

p0305 TMT posits that psychological equanimity requires a well-functioning anxiety buffer that entails faith in one's worldview, self-esteem, and close interpersonal attachments. Threats to any of these anxiety-buffer components signal a potential for anxiety that typically engenders defensive efforts to restore the integrity of the system and thus ward off this anxiety. From this perspective, many of the vicissitudes of thought, emotion, and behavior in daily life reflect attempts to respond to fluctuations in the functioning of this system. But the effectiveness of this anxiety-buffering system varies across persons and situations, leaving some people secure and confident and others riddled with anxiety. TMT follows many previous theories in suggesting that many forms of psychological dysfunction and disorder result from, or are exacerbated by, ineffective control of anxiety and reflect maladaptive attempts to cope with such malfunctions.

p0310 Consistent with the idea that many psychological disorders result from an inability to effectively manage anxiety, high levels of anxiety are central components of many DSM-V diagnoses, including not only the many problems that fall under the blanket category of anxiety disorders but also others where anxiety itself is not the defining feature, such as depression, posttraumatic stress disorder (PTSD), obsessive–compulsive disorder, substance abuse, sexual difficulties, and schizophrenia. Anxiety is widely recognized as a common comorbid problem associated with many psychological disorders. And high levels of anxiety or neuroticism have been found to be associated with a wide range of other undesirable psychological states and traits, such as guilt, shame, uncertainty, shyness, procrastination, academic difficulties, and interpersonal problems. Although most of this research is correlational, difficulties controlling anxiety seem likely to play at least some role in the etiology of diverse psychological problems.

p0315 Research has shown that reminders of death increase the severity of psychological symptoms of some disorders. For example, Strachan et al. (2007) found that MS led diagnosed spider phobics to judge spiders depicted in

photos as more dangerous and to spend less time looking at them, people high in obsessive–compulsive tendencies to spend more time and use more soap and water when washing their hands, and people high in social anxiety to become more avoidant of social interactions. Following Yalom (1980), Strachan et al. (2007) interpreted their findings as reflecting participants' tendency to focalize their fear of death onto smaller objects that are easier to control. Although there is nothing, one can do to avoid death, spiders, germs, and embarrassing interactions with others can be avoided if one is sufficiently vigilant.

p0320 Additional research found that concerns about death underlie psychological dissociation in response to trauma, and that individuals who experience intense fear of death during a traumatic event are especially likely to dissociate and subsequently develop PTSD (Gershuny, Cloitre, & Otto, 2003). Moreover, in 2005, New Yorkers reminded of their mortality and then asked to recall how they felt during the 9/11 terrorist attacks, or when they watched video footage of the attacks, reported greater dissociative reactions, such as feeling like they were outside of their own body, compared to a control group of students who thought about being in pain or an upcoming exam (Kosloff et al., 2006). These dissociative reactions in turn led to more anxieties about the future.

p0325 Another study (Abdollahi, Pyszczynski, Maxfield, & Luszczynska, 2011a, 2011b) tracked people who had survived a traumatic earthquake in Zarand, Iran, in 2005, in which over 1500 people perished and almost 7000 had to evacuate their homes. When reminded of their own death or the earthquake a month later, survivors who did not dissociate in the aftermath of the earthquake responded without anxiety. They instead responded to MS by expressing negativity toward foreigners, a typical defensive maneuver to manage terror. However, survivors who did dissociate during the earthquake, when reminded of their mortality or the quake a month later, reported a great deal of anxiety and did not express antipathy toward foreigners. The usual means of terror management, bolstering one's own group at the expense of others, was apparently unavailable to the survivors who had dissociated. And 2 years later, these high dissociators were far more likely to have developed PTSD than those who had not dissociated and continued to show atypical responses to MS. This absence of defensive response to MS mediated the relation between dissociation at the time of the quake and PTSD 2 years later, suggesting that this disruption of normal terror management defenses plays an important role in the emergence of this disorder. Similar results have been found for Polish victims of domestic violence

(Kesebir et al., 2011) and survivors of a civil war in the Ivory Coast (Chatard et al., 2012).

s0080 6. SUMMARY OF TERROR MANAGEMENT THEORY AND RESEARCH

p0330 According to TMT, the uniquely human awareness of death gives rise to potentially paralyzing terror that is assuaged by embracing cultural worldviews and meeting or exceeding the standards of value associated with them (i.e., self-esteem) in pursuit of literal and/or symbolic immortality. Convergent empirical support for TMT was originally obtained by studies demonstrating that: momentarily elevated or dispositionally high self-esteem reduces anxiety, autonomic arousal, and defensive cognitive distortions produced by psychological and physical threats; making MS increases defense of the cultural worldview and self-esteem striving; and threats to cherished cultural beliefs or self-esteem increase the accessibility of implicit death thoughts (DTA).

p0335 Subsequent theoretical and empirical inquiry has led to: an elucidation of the psychological mechanisms underlying MS effects, culminating in the development of a dual-process model of proximal and distal defenses that are instigated in response to conscious and unconscious death thoughts, respectively; a developmental account of how the anxiety-buffering system emerges over time as an elaboration of infant attachment to primary caretakers; a research program devoted to explaining how existential concerns foster discomfort with physical bodies and bodily processes, particularly sex; important additions to contemporary understanding of how mind, culture, morality, religion, and other aspects of culture evolved in the early days of our species and continue to change to this day; and a model of psychopathology as terror mismanagement.

s0085 7. CRITICISMS OF AND ALTERNATIVES TO TERROR MANAGEMENT THEORY

p0340 Despite the large body of research inspired by TMT, the theory also has attracted its share of criticism. This has sometimes been a little disturbing to us—because condemnation of the theory threatens our cherished beliefs and self-esteem, leaving us flooded with highly accessible death-related ideation, which is compounded by the constant reminders of death that litter our papers. But critical skepticism is essential for scientific progress. We're

convinced that constructive critiques of TMT and associated research have played an invaluable role in promoting the theory's development and refinement. In the following section, we discuss what we believe are the most important and influential criticisms of the theory and alternative explanations for the associated research. We organize our discussion around Martin and van den Bos's (2014) recent overview of criticisms of TMT, because both of these authors have been long time critics of the theory and are, as Stephen Colbert would put it, particularly persistent "worthy adversaries."

s0090 7.1 Falsifiability and Insularity

p0345 One criticism Martin and van den Bos (2014) lodge against TMT is that the theory is not falsifiable because "conflicting results are not integrated into the theory," "alternative explanations have been ignored," and it is problematic that "mortality salience can heighten self-interest ... as well as prosocial interest ... can make people more lenient ... as well as more punitive ... it can increase tolerance ... or it can increase aggression ... [and] lead to health-promoting or health-endangering behavior" (pp. 52–53). However, Martin and van den Bos neglected to mention that TMT hypotheses have to our knowledge always been derived from the core propositions of TMT. The theory emphasizes the role of the cultural worldview and bases of self-worth in determining how people will manage the potential terror of death. Thus, the effects of MS are never really main effects. Indeed, we began examining the moderating role of individual differences in worldview defense in response to MS in our second MS study (Rosenblatt et al., 1989, Study 2) and have continued ever since. When surprising results have occurred, as those reported to us by Ochsmann, we have then sought to understand those anomalies by exploring relevant process in a more refined way. This is, according to Thomas Kuhn in *The Structure of Scientific Revolutions* (1962), how "normal science" proceeds; i.e., anomalous findings draw attention to areas of inquiry that foster either theoretical refinement if the anomaly can be explained by the addition of internally consistent assumptions that are then verified empirically, or abandonment of the theory entirely if the anomalous findings are ultimately inexplicable without additional assumptions at odds with the theory.

p0350 To give another example, Greenberg et al. (1990) found that low authoritarians did not derogate an attitudinally different other in response to MS. This led us to hypothesize that because political liberals value tolerance as

part of their worldview, they will not derogate a different other after MS; moreover, MS might lead them to increase their tolerance of a different other. We then found support for these hypotheses in two studies (Greenberg et al., 1992). In the first, MS led conservatives to be more harsh toward a liberal, but tended to lead liberals to become less harsh toward a conservative. We then considered an alternative explanation that MS led all these participants to be supportive of conservative views. So in a second study, we tested the valuing tolerance hypothesis by priming the value of tolerance, a value to which virtually all Americans pay at least lip service. We predicted and found that this prime led MS participants to become less harsh toward an anti-American essay writer (Greenberg et al., 1992, Study 2).

p0355 We agree with Martin and van den Bos that it is often difficult to predict exactly how people will respond to reminders of death (or any other threat for that matter). People are complex animals who differ in biological temperament, in the content of their cultural worldviews, and in the particular aspects of the worldview that they internalize as their own. And situations vary in terms of which beliefs and values are most salient. People are thus likely to have multiple and sometimes conflicting elements of their worldviews to rely on for terror management purposes, making it difficult to make *a priori* predictions of which one they will gravitate toward.

p0360 Accordingly, we have devoted considerable attention to specifying individual differences, such as self-esteem (e.g., Harmon-Jones et al., 1997), attachment style (e.g., Mikulincer & Florian, 2000), personal need for structure (e.g., Dechesne, Janssen, & van Knippenberg, 2000), and right wing authoritarianism (e.g., Greenberg et al., 1990), that determine which of the many possible sources of security different people gravitate toward when faced with existential threat. Other research has documented the important role that momentary accessibility of beliefs and values plays in this process, and has shown, for example, that MS can lead to diametrically opposed responses, such as increased support for either war or peace, and greed or prosocial behavior, depending on which values have recently been primed (for reviews, see Anson, Pyszczynski, Solomon, & Greenberg, 2009; Rothschild et al., 2009). Although TMT doesn't stipulate which of the many possible sources of security particular people will gravitate toward in specific situations, research is making progress toward providing such specification. It now seems reasonably clear that people cope with death by clinging to values in which they are highly invested and that are high in momentary accessibility. Still, we agree that even more precise elucidation of which anxiety-buffer

elements will be used in any given instance is needed. Ironically, the theories that have been proposed as alternatives to TMT provide even less basis for predicting the specific nature of responses to threats, and most invoke concepts so undifferentiated (e.g., meaning, approach motivation, certainty) that there is no conceptual basis at all for making specific predictions. This is an issue for all complex multidimensional theories that entail dynamic interactions among their components (e.g., predicting when cognitive dissonance will produce changes in attitudes, behavior, or adopting additional cognitions). Like all theories, TMT is a tool for expanding our understanding of nature, which requires refinement in response to empirical findings, rather than provides an immutable oracle that requires no additional input to generate accurate predictions.

p0365 Martin and van den Bos's next claim, that we "ignore alternative interpretations," is simply untrue. A substantial portion of the empirical research that we and others have conducted over the years was undertaken with the explicit goal of answering questions raised by reviewers and critics, involving issues such as the role of affect in the MS effect (e.g., Greenberg et al., 2003, 1995), the cognitive processes through which thoughts of death affect behavior (e.g., Arndt, Greenberg, Pyszczynski, et al., 1997; Arndt, Greenberg, Solomon, et al., 1997), whether the increase in DTA produced by worldview and self-esteem threats is specific to death or simply reflects general negativity (e.g., Schimel, Hayes, Williams, & Jahrig, 2007), various alternative explanations for MS effects (e.g., Greenberg et al., 1995), and the interface of defensive and growth-oriented motives (e.g., Vail et al., 2012). Au1
We've devoted entire papers to responding to critical assessments of TMT (e.g., Landau, Solomon, Pyszczynski, & Greenberg, 2007; Pyszczynski, Abdollahi, et al., 2006; Pyszczynski, Greenberg, Solomon, & Maxfield, 2006; Solomon, Greenberg, & Pyszczynski, 1997), including an extensive response to an issue of *Psychological Inquiry* devoted entirely to critiques of TMT. Although we find some critiques of TMT misguided, we have done our best to respond to them and explain why we find them unconvincing, to examine them empirically (e.g., we have used uncertainty salience as a comparison condition in over 20 studies), and incorporated some of the issues they raise into our conceptual analysis.

s0095 7.2 Consistency with Evolutionary and Biological Perspectives

p0370 Another common claim is that TMT is not consistent with modern evolutionary theory. Some have taken us to task for the statement that awareness of

the inevitability of death is terrifying for "an animal instinctively driven toward self-preservation and continued experience" (Solomon et al., 1991, p. 95), arguing that evolution produces specific solutions to specific environmental challenges rather than general all-purpose adaptations or "instincts." Our use of the term "self-preservation instinct" was intended to give credit to the psychoanalytic roots of TMT's fear of death construct in Zilborg's (1943) analysis of the fear of death. We included the self-preservation construct in the theory to provide a simple explanation of why knowledge of death would inevitably create fear; ironically, we assumed this would be the *least* controversial aspect of the theory, because it seems obvious that people want to stay alive. However, some evolutionary psychologists (e.g., Buss, 1997; Fessler & Navarrete, 2005) pointed out that a unified motive oriented to stay alive is unlikely if one takes a modular approach to thinking about evolution. Because the specifics of how the motivation to stay alive emerged is not particularly germane to the main points of the theory, we changed our verbiage to refer to a "general inclination to stay alive" rather than an instinct, noting that the vast majority of bodily systems ultimately function to keep organisms alive long enough to reproduce and care for their offspring. We suspect that in humans and other cognitively complex species, a general motive to stay alive arises as an emergent property of specific life-supporting adaptations in specific organ systems, especially the brain; see Deacon (1997) and Langer (1967) for similar arguments. But whether one conceptualizes this inclination to stay alive as a series of interrelated adaptations that serve the same function (survival so that genes can be passed on) or a single emergent motive that results from these specific adaptations is largely irrelevant to the rest of the theory and the major points it makes.

p0375 Others have argued that fear is a useful adaptation and that evolution would never produce adaptations (i.e., cultural worldviews and self-esteem as anxiety buffers) that undermine something as functional as fear (Fessler & Navarrete, 2005; Kirkpatrick & Navarrete, 2006; Leary, 2004). Although we of course agree that fear is an adaptive emotion that evolved because it stimulates adaptive life-preserving behavior, it is clear that people do a lot of things to minimize their fears, some of which are adaptive (e.g., taking deep breaths; seeking help from others) and some of which are not (e.g., consuming large amounts of alcohol; exaggerating one's abilities). It is also clear that many antagonistic systems exist throughout the body to put the brakes on adaptive responses to prevent too much of an otherwise good thing. But this criticism misses the point: TMT views cultural worldviews

and self-esteem as means to manage the fear produced by the ever-present knowledge of the inevitability of death rather than immediate threats to continued existence. Although fear in response to imminent threats is usually adaptive, fear in response to awareness of an inevitable unavoidable future event is generally not. This is why we argue that our ancestors invented ways of managing their fear of death.

p0380 More recently, Tritt et al. (2012) have taken the opposite tack, arguing that it is unlikely a system designed specifically to deal with the problem of death could be a product of evolution given that more primitive and domain general systems exist to respond to simpler challenges that require less cognitive complexity than what is needed to cognize death. We agree to a certain extent. Specifically, while death awareness (and the potential for terror engendered by this awareness) is a uniquely human problem, different from all other fears, the terror management system developed by building on more primitive systems that evolved to respond to simpler problems. Although our initial discussions of how the anxiety-buffering system emerged in early humans did not go very far into the details of this process beyond positing that it emerged in response to awareness of the inevitability of death, we certainly never disputed the idea that both biological and cultural evolution build on earlier adaptations to previous adaptive challenges.

p0385 But this does not imply that understanding the primitive building blocks of the human adaptation to awareness of the inevitability of death explains the system that ultimately emerged to deal with it. It is widely agreed, for example, that humankind's complex visual apparatus evolved out of very primitive light sensitive cells in far simpler species, but no one would suggest that this provides a comprehensive explanation for the workings of the eye and visual cortex. We argue that although interesting and useful in its own right, identifying the primitive aspects or biological underpinnings that served as the foundation of the system that our ancestors constructed to deal with their burgeoning awareness of death is insufficient to provide a useful understanding of that system.

p0390 Frankly, we're puzzled by the general lack of attention given to the problem of death by most evolutionary psychologists. We question evolutionary psychologists' near exclusive emphasis on adaptation to features in the external physical and social environment, because there is nothing in Darwin's or any other evolutionary theory that limits evolution to adaptation to external features. Indeed, it is clear that internal adaptive challenges are also subject to natural selection, as when physical features of organs change over time in

response to mutations that make them more compatible with other organs or their products or processes. What is somewhat unique is that TMT focuses on the impact of an idea (i.e., the inevitability of death), a product of the human mind, as an important influence on other ideas generated by people that are spread within and across groups, which then may make particular biological features of the brain more adaptive, which therefore themselves change over time in response to this idea (see Varki & Brower, 2013, for a similar evolutionary account of the central role of death denial in human mentation).

7.3 Cultural Differences

p0395 Hypotheses derived from TMT have been tested and supported in experiments conducted in over 25 countries the world over. Although most of these studies were conducted with participants from Western cultures, others were conducted in the Middle East and North Africa (e.g., Israel, Palestine, Iran, Ivory Coast, Turkey), Asia (e.g., Japan, Korea, China, India, Hong Kong, Tibet), Latin America (Mexico, Costa Rica), and at least one was conducted with bicultural Aboriginal Australians. Nevertheless, Martin and van den Bos (2014) argue that TMT trivializes culture and glosses over cultural differences. We find this claim a little strange because we have—long before it became fashionable to do so in social psychology—always emphasized the importance of culture and cultural differences in bases of self-esteem. They argue that MS effects are less consistent and of smaller magnitude on the average in non-Western cultures and that several studies in non-Western cultures have failed to find any MS effects at all (Yen & Cheng, 2010).

p0400 Although we agree that much more research is needed in non-Western cultures and there is much to be learned about cultural variations in dealing with death, theory-predicted effects have been found in studies conducted in *all* of the Asian countries in which TMT research has been conducted. Research conducted in East Asian cultures has shown that MS increases nationalism, negative evaluations of those who criticize one's culture, support for military action to defend one's country, in-group bias in job allocations, and the appeal of material goods (for a review, see Park & Pyszczynski, in press), much like what has been found in research conducted in Western cultures. TMT posits that people from different cultures deal with the awareness of death in different ways, depending on the nature of their cultural worldviews. Thus, findings that people from individualistic

cultures respond to reminders of death by striving to maximize their individual value while people from collectivist cultures respond by striving to maximize their collective value (e.g., Kashima, Halloran, Yuki, & Kashima, 2004) are *exactly* what is predicted by the theory. In related vein, Wakimoto (2006) found that MS led Japanese students who were strongly enculturated to the Japanese interdependent worldview to respond to success in a self-effacing manner but reduced self-effacement among those less enculturated to the Japanese worldview. Similarly, a study of multicultural Aboriginal Australians found that MS increased collectivist responses when their aboriginal identity was primed and individualistic responses when their Australian identity was primed (Halloran & Kashima, 2004).

p0405 Although TMT posits that the fear of death and cultural meaning systems that mange this fear are universal, the content of these meaning systems are viewed as culture specific, thus leading to cultural variations in how they are manifested. Given that East Asian cultures value collective over individual identity and view modesty and humility as virtues, what would appear to reflect a lack of self-esteem striving within a Western context may actually reflect attempts to demonstrate one's value by behaving in a modest nonself-aggrandizing way in a more collectivist cultural context. This issue is not unique to TMT and has been debated extensively in the literature on cultural differences in the self. Whereas some have argued that the self-esteem motive is a uniquely Western phenomenon that is largely absent in East Asian cultures (e.g., Heine, Lehman, Markus, & Kitayama, 1999), others have argued that apparent cultural differences in self-esteem striving reflect differences in what cultures value as prototypic of a good person (Sedikedes, Gaertner, & Vevea, 2005). Clearly, TMT falls in the latter camp. Ever-increasing trends toward globalization and infiltration of values from other cultures complicate matters further, making it even more difficult to specify exactly which values people from different cultures in specific situations will be oriented toward when motivated to demonstrate their value.

p0410 It is also possible that some cultures are more accepting of death than others. For example, Yen and Cheng (2010) assert that many Asians view death as a natural and even desirable part of life. Viewing life and death as part of the same process is a central tenet of many forms of Buddhism and other Eastern religions. However, many Americans also claim not to fear death. We have found that what people consciously report about death bears no clear relation to how they respond to reminders of mortality. And we are skeptical that it's biologically possible not to fear death. Of course, strong terror management resources can help people endure reminders of mortality

without need for additional defense. For example, recent studies suggest that Buddhism, meditative states, and mindfulness may have such protective value. We found that although MS increases derogation of a person who criticizes Korea among Korean non-Buddhists, this effect does not occur among Korean Buddhists (Park & Pyszczynski, in press). Interestingly, the effect of MS on derogation of a person who criticized Korea was eliminated among another sample of Korean non-Buddhists after a 45-min Zen meditation training exercise (Park & Pyszczynski, in press). Similarly, Niemec et al. (2010) found MS effects among persons low but not high in dispositional mindfulness, a state that is a central goal of most meditation practices. These findings may help explain some of the differences in responses to MS between people from Eastern and Western cultures that research has sometimes (though not always) found.

s0105 7.4 What's so Special About Death?

p0415 In the early days of the theory, many psychologists told us that, because they themselves are not afraid of death, it is unlikely that the fear of death could play a significant role in much of what people do. As data came in, documenting the wide-ranging effects that reminders of death have on people, the focus of criticisms shifted to the implausibility of a system which functions to manage this one specific fear. Indeed, TMT's focus on the fear of death runs counter to a long history of domain general theorizing in psychology that emphasizes very broad motives and processes that cut across the specific content of people thoughts and fears.

p0420 Far and away the most common critique of TMT consists of attempts to reduce the problem of death to a specific instance of some other more general threat. Rather than arguing that death is not threatening, more recent critics argue that death is a specific case of a more general threat, which is the "real reason" thoughts of death produce the effects they do. The most popular and influential of these alternatives argue that death is threatening because of the uncertainty it entails (e.g., Hohman & Hogg, 2011; McGregor et al., 2001; van den Bos & Miedema, 2000); because it undermines meaning (Heine, Proulx, & Vohs, 2006); because it is largely uncontrollable (Fritsche, Jonas, & Fankhanel, 2008); or because it threatens social relationships and belonging (e.g., Leary, 2004; Navarrete & Fessler, 2005).

p0425 People fear death for many reasons, including those proposed as alternatives TMT (Florian & Mikulincer, 1998b). But the problem of death cannot be reduced to any one of these specific features. It encompasses *all* these

concerns and many others: the absence of experience, the cessation of bodily functions, bodily decay, burial or cremation, not being involved in future events, and the possibility of continuation of consciousness after during burial or during cremation. From the perspective of TMT, though, the most basic problem with death is that it entails *not living*, which is the prerequisite for all other human needs, motives, and desires. As we stated in the initial presentations of the theory, from the perspective of TMT, it is the *terror of absolute annihilation*, the fear of not being, that is most disturbing about death (e.g., Solomon et al., 1991, p. 96).

p0430 Nonetheless, we agree that certainty, meaning, control, and interpersonal relationships are important motives in their own right. However, positing that these motives also play important roles in managing the terror of death is quite different than claiming that they are the "real reason" people fear death. Cultural worldviews buffer anxiety by imbuing existence with *meaning*, the possibility of attaining personal value (self-esteem), and the hope of transcending death. To effectively *control* death anxiety, people require faith (i.e., *certainty*) in the validity of their worldviews and self-concepts. Because the most important aspects of worldviews cannot be directly observed and some violate direct sensory experience, people require *consensual validation* of their worldviews and self-concepts from others to maintain the *certainty* that enables these structures to manage their fears; thus, acceptance from *other people* is essential for effective terror management.

p0435 This in no way implies, though, that effective anxiety-buffer functioning is the *only* reason people need meaning, certainty, control, or other people. Effective goal-directed behavior clearly requires these psychosocial resources; these constructs play central roles in most contemporary theories of self-regulation (e.g., Bandura, 1986; Carver & Scheier, 1981a, 1981b). The central claim of TMT is that in addition to the pragmatic functions they serve, these psychological entities are part of the system through which people control existential fear. As discussed above, the terror management system builds on more primitive systems that initially evolved to serve more concrete pragmatic functions. TMT posits that awareness of death changes the way the motives for meaning, certainty, control, and interpersonal connections operate. These needs extend beyond their pragmatic function to that of maintaining a conception of reality and one's contributions to it that detoxify death.

p0440 Purely pragmatic motives that serve to facilitate effective action would orient people toward the most accurate meanings possible and toward connections with people who are most useful for meeting their pragmatic needs.

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Although people *sometimes* seek accurate meanings that fit well with observable reality, they also sometimes go to great lengths to believe things that conflict with the information provided by their senses and to connect with those who help them to maintain these counter-experiential beliefs. Death-denying motives help explain such departures from practical utility.

s0110 7.5 Do Other Threats Produce Effects Similar to Mortality Salience?

p0445 Soon after our initial MS studies (Greenberg et al., 1990; Rosenblatt et al., 1989) were published, critics asked whether these effects were driven by thoughts of death, *per se*, or whether any aversive event or negative affective state yields the same effects. This led us to begin contrasting MS with control conditions in which participants were given parallel inductions regarding other unpleasant and threatening events, such as failure, uncertainty, worries about the future, general anxieties, meaninglessness, giving a speech in front of a large audience, social exclusion, paralysis, and physical pain; our strategy was to make the MS and control inductions parallel to each other but vary the specific aversive event about which participants were asked. The first of these studies showed that thoughts of worries about life after college did increase negative affect but did not increase worldview defense; thoughts of death, on the other hand, did not produce negative affect but did increase worldview defense (Greenberg et al., 1995). Well over 100 other studies have shown that MS produces effects different from thoughts of these other threats. These studies make it clear that not just any aversive event or threat leads to the effects that MS produces.

p0450 However, more recent studies have shown that other types of threats, such as personal dilemmas (e.g., McGregor et al., 2001), thoughts of being uncertain (van den Bos & Miedema, 2000), or not having control (Fritsche et al., 2008), disconfirmation of expectations (Proulx & Heine, 2008), and even abstract art and absurdist literature (e.g., Proulx & Heine, 2009), sometimes produce effects parallel to those of MS. Critics of TMT view these studies as evidence that the problem of death is a specific instance of these other threats. These are interesting findings, but there are important issues to consider regarding their implications for TMT.

p0455 Prior to the development of TMT, there were already substantial literatures showing that people respond defensively to threats to their self-esteem and meaning systems: e.g., self-serving biases, cognitive dissonance, just world beliefs, and other motivated cognitive distortions. Thus, it is not surprising that research continues to show that threats to these psychological

entities produce defensive reactions. TMT was developed, in part, to explain *why* people need self-esteem and certainty regarding their meaning systems. We developed the MS hypothesis as *one of several converging approaches* to assessing the proposition that self-esteem and cultural worldviews provide protection from death-related anxiety. The purpose of the MS hypothesis is to serve as a tool for assessing the validity of TMT, rather than the purpose of TMT being to provide an explanation for the MS effect. A compelling alternative to TMT needs to go beyond providing an alternative explanation for one line of evidence regarding the theory and address the literature in its entirety.

p0460 But because the MS research is central to the TMT literature, it is clearly important to understand the nature of the effects demonstrated there. What should be made of this mixed evidence? Looking only at the pattern of empirical results and ignoring conceptual arguments, one could summarize the existing literature by saying it shows that in the vast majority studies, MS produces different effects from many aversive control conditions, but that some studies have found other threats producing effects paralleling a subset of the effects of MS. Among that majority of studies, MS has been found to produce different effects than making salient threats of uncertainty, pain, loss of control, failure, meaninglessness, and attachment disruptions. If 100 studies found aspirin to have different effects than acetaminophen, and 40 studies found similar effects, it would not make sense to conclude that aspirin is just one version of acetaminophen and the same processes are triggered by both. Pertinent to this point, Martens, Burke, Schimel, and Faucher (2011) found in a meta-analysis that whereas MS effects get stronger with longer delays, effects of threats to meaning and certainty get weaker, suggesting that different processes are often if not always involved.

p0465 In addition, given the impossibility of accepting the null hypothesis, it cannot be concluded that MS produces the *same* effect as these other threats. Given that all of the threats of interest here are abstract psychological states, it is always possible that studies that find no difference between MS and other threats have used ineffective manipulations of one or the other threat or insensitive dependent measures, lack of statistical power, or have other problems that prevent them from finding real effects. But this is not a very satisfying answer to the question of whether MS is the same or different from other threats.

p0470 This begs the question of whether the processes that produce defensive responses to other threats are at least sometimes the same as those involved in MS effects. From the perspective of TMT, similar processes might be

involved if other threats increase the accessibility of death-related thoughts. Because a large body of literature has shown that threats to worldviews, self-esteem, and attachments increase the accessibility of death related but not other aversive thoughts (for a review, see Hayes et al., 2010), it is possible that at least some of the defensive responses are caused by threats to the anxiety buffer, which increase DTA and produce defensive responses for this reason.

p0475 Some researchers, for example, McGregor et al. (2001), van den Bos and Miedema (2000), and Proulx and Heine (2009), report that the other threats they have investigated increase worldview defense but do not increase DTA. However, some of these studies used procedures that varied from ours in small but theoretically significant ways. For example, McGregor et al. (2001, Studies 3 and 4) found that a temporal discontinuity manipulation (specifically, asking university student participants how they might think about a childhood memory 35 years in the future) produced increased cultural worldview defense comparable to an MS induction, but did not increase DTA. It seemed to us that asking people to think about themselves in the distant future could plausibly conjure up intimations of mortality; and when we examined the materials from this study, we noticed that the supposedly neutral passage between the temporal discontinuity manipulation and the assessment of cultural worldview defense made explicit reference to death, which could keep death thoughts in focal attention and suppress DTA accordingly. Chaudry, Tison, and Solomon (2002) consequently replicated the McGregor et al. study with the neutral passage from our experiments and found that the temporal discontinuity manipulation produced the same increase in DTA as a traditional MS induction. McGregor and colleagues then replicated the finding that temporal discontinuity increases DTA in their lab (Ian McGregor, personal communication to Sheldon Solomon, October 16, 2001).

p0480 Other studies used DTA measures different from those used in most TMT research that appear to be considerably less sensitive. Whereas the word stems used in our measure are designed so that there are generally just two possible words to complete each critical item which can be completed by filling in two additional letters, the measures used in many of the studies conducted by others had multiple possible completions, were more open-ended, and had more open letters. Weber, Zhang, Schimel, and Blatter (2015) found that some of the manipulations of meaning threat used by Proulx and colleagues (Proulx & Heine, 2009; Randles, Heine, & Santos, 2013) yielded increased DTA when our usual more sensitive measure was

used. Thus, the possibility that these other threats produce effects parallel to MS because they produce a subtle increase in DTA remains.

p0485 Besides the possibility that other psychological threats produce effects similar to MS because they increase DTA (in which case such findings would follow directly from TMT), it is also not clear how these alternative explanations for MS effects would account for the dramatic and reliable difference in the nature of proximal defenses that emerge immediately after MS and distal defenses that emerge when thoughts of death are accessible but not in focal attention. Why would threats to certainty, meaning, control, or belonging lead to behavior aimed at increasing one's health and longevity immediately after they are perceived but to behavior aimed at shoring up one's worldview, self-esteem, or attachments after a delay or distraction? And, why would this difference evaporate and worldview defense emerge immediately after these threats when they are presented subliminally (see Arndt, Cook, & Routledge, 2004, for a review of this literature)? Indeed, although researchers testing alternatives to TMT include a delay and distraction after their threat inductions, it is not at all clear why this would be needed from their perspectives; rather than providing a theoretical rationale for their use of a delay, these researchers simply cite our studies showing that MS effects on worldview defense require a delay or distraction between the threat induction and measurement of defense. Their explanations of why uncertainty and meaning threats produce defensive responses make a little more sense when people are consciously contemplating these threats, yet that is precisely when symbolic terror management defenses do *not* occur.

p0490 Tests of other TMT hypotheses also undermine these alternative views. Many studies have shown that threats to self-esteem, worldviews, and close relationships increase DTA, and that boosts to each of these anxiety-buffer components reduce both DTA- and MS-induced defense. Anxiety-buffer threats increase DTA while not increasing the accessibility of other negative thoughts (Hayes et al., 2010), and evidence for an afterlife reduces worldview defense in response to MS (e.g., Dechesne et al., 2003). The fact that threats to these anxiety-buffer components activate and respond to content specifically focused on death, and that bolstering these components reduces DTA, shows that death is central to these processes. Studies have also shown that DTA mediates the relation between MS and worldview defense (e.g., Cohen, Sullivan, Solomon, Greenberg, & Ogilvie, 2011; Das, Bushman, Bezemer, Kerkhof, & Vermeulen, 2009; Vail, Arndt, et al., 2012). It is not at all clear how any of the alternatives to TMT would explain these findings. Although critics usually restrict their focus to the MS effect itself, a viable alternative to TMT needs to account for all of the TMT literature.

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s0115 7.6 Conceptual Problems with Alternatives to TMT

p0495 Because we have provided extensive critiques of most alternatives to TMT elsewhere (e.g., Landau, Solomon, Pyszczynski, & Greenberg, 2007; Pyszczynski, Abdollahi, et al., 2006; Pyszczynski, Greenberg, et al., 2006; Solomon et al., 1997), here we discuss only the most serious issues that render them conceptually implausible. Because we've yet to see responses to our critiques of these alternative perspectives, we again invite the proponents of these alternatives to address the issues we raise so that we can better understand their reasoning.

s0120 *7.6.1 Uncertainty*

p0500 Some theorists argue that uncertainty about either when and how death will occur or what happens afterward (e.g., Hohman & Hogg, 2011) or general personal uncertainty activated by reminders of death (e.g., McGregor, 2006; van den Bos & Miedema, 2000) underlies the MS effects that have been documented in the literature. However, death is one of the few truly certain things in life. Although uncertainty surrounding death is *one* of the many things that are troubling about it, there are certainly many other terrifying aspects of death. Besides, people don't always prefer certainty over uncertainty. Research has shown that people actively avoid certainty in many situations, usually when they fear unpleasant truths. Avoiding diagnostic medical tests, self-handicapping, and gambling are all examples of active avoidance of certainty. Unrealistic optimism in many domains of life, including those related to one's health and longevity, is well documented (e.g., Weinstein & Klein, 1996). And although some people might believe they would like to know with certainty what happens after death, we suspect their enthusiasm for such knowledge would wane if the answers were not to their liking. As we've asked uncertainty theorists before (Pyszczynski et al., 2010, p. 7550): "Would people rather believe there certainly is not an afterlife or that there *might* be one? Would they rather believe they will certainly be forgotten a few years after they die, or that their memory *might* live on indefinitely? Would it be comforting for people to know that they were absolutely certain to die a painful death a year from today, or would they prefer the possibility that they will live a happy and productive life into their 90s and then die painlessly in their sleep?" Do uncertainty theorists really believe that people would prefer to know with certainty they will never find a loving partner or succeed in their career, as opposed to holding out hope that they might? Would people rather be certain they are stupid, unattractive, and untalented or remain hopeful about these domains? Our point here

is that the motive to avoid undesirable information is often more powerful than the motive for certain knowledge, and this seems especially true with matters of life and death. Uncertainty theories leave us uncertain as to when uncertainty will be avoided and when it will be sought.

s0125 ### 7.6.2 Meaning Threat

p0505 It has also been argued that thoughts of death are threatening because they undermine meaning. In their Meaning Maintenance Model (MMM), Heine et al. (2006, p. 90) define meaning as "what connects things to other things in expected ways – anything and any way that things can be connected." Because human beings are meaning-making animals, threats to meaning lead to attempts to restore meaning, which sometimes extend to domains unrelated to the original disruption. They argue that thoughts of death produce the effects they do because they undermine meaning frameworks and, importantly, are not different in any significant way (except perhaps extremity) from any other expectancy disconfirmation or perceptual anomaly.

p0510 But is it plausible that the major reason death is threatening is that it undermines meaning? We simply don't understand how thoughts of death, regardless of their content, are a threat to "any way that things can be connected" (Heine et al., 2006, p. 90). The inevitability of death is a fact of life, part of the meaning system of all but the youngest children, and surely part of the meaning systems of all who have ever participated in MS experiments. Another meaning that can be affixed to death that fits the MMM definition of meaning quite well is that all consciousness ends at the moment of death, never to be regained, and that in a short time all remnants of our existence will be lost. Although unpleasant, this meaning fits better with observable reality than what most people believe. Yet people avoid meanings such as this and exert considerable energy to preserve more pleasing, but less likely, meanings. A fatal flaw of the MMM is that it has no conceptual basis for predicting a preference between these two or any other alternative meanings.[4]

p0515 Although people sometimes say death robs life of meaning, it is not the MMM's very general "relationships among things" sort of meaning to which

np0020 [4] Although the vast majority of people hold comforting beliefs entailing some form of life after death, some people do accept the less comforting idea that consciousness ends at death. It's important to be clear that although TMT posits a motive to believe comforting things about death, this does not mean that this motive will outweigh all other forces and sources of information. The biological worldview espoused by most of today's scientists is compelling to many people for reasons that may outweigh the desire to believe in an afterlife. TMT suggests that accepting worldviews that do not include literal immortality requires greater commitment to symbolic immortality or other ways of coping with the problem of death.

they are alluding. Rather, this usually refers to the sort of cosmic significance that TMT posits people use to shield themselves from the terror of nonexistence. From our perspective, the MMM has the problem backward: people do not fear death because it undermines meaning, but rather, need life to be meaningful to protect themselves from the fear of death. Both ontologically and phylogenetically, it seems highly unlikely that the capacity to view life as cosmically significant precedes the capacity to be frightened by the prospect of death, which would be necessary if the fear of death was a response to threats to cosmic meaning.

p0520 Importantly, not just any meaning will do when it comes to dealing with death—or most other problems for that matter. People work hard to preserve the culturally transmitted meanings our ancestors invented to enable them to cope with knowledge that death is an inevitable fact of life. Research shows that MS (and other threats when they have such effects) increases belief in an afterlife, deities, supernatural powers, nationalism, and the value of one's attachment figures. The MMM provides no specification of which meanings people seek and which they avoid and no basis for predicting the direction of people's responses to threats. Recent refinement of the model (Proulx & Inzlicht, 2012) that posits an initial preference for restoring meaning on the threatened dimension, which generalizes to other domains only if the specific threat is not resolved, is a step in the right direction, but further specification of what determines the preferred content of meaning-making efforts and further consideration of the functions of different levels and types of meaning are still needed.

s0130 7.6.3 Explaining MMM Effects

p0525 We suspect that the types of expectancy disconfirmations and perceptual discrepancies studied in MMM research do not motivate people toward any specific types of meaning because they involve processes different from those activated by MS. One sensible way to understand expectancy disconfirmations and perceptual discrepancies is that they arouse dissonance. And dissonance motivates efforts to defend beliefs and affirm values. Indeed, evidence shows that arousal mediates the effects in these studies. In contrast, evidence suggests that MS does not produce physiological arousal and that arousal does not mediate its effects.

p0530 Another way to understand these effects builds on research showing that disconfirmed expectancies instigate inferential processes aimed at resolving the disrupted meaning that such disconfirmations produce. For example, Pyszczynski and Greenberg (1981) found that unexpected behavior from

an attractive female confederate prompted questions to her that were relevant to the unexpected behavior over the more interesting things that college men were likely to ask in the absence of the unexpected behavior. Wong and Weiner (1981) found that unexpected behavior increased interest in "why" questions. This research raises the possibility that the effects produced by the expectancy violations and perceptual anomalies in MMM research (e.g., Randles et al., 2013) are due to a general increase in epistemic motivation and inferential processing. This of course is quite different from the directional effects posited by TMT. Consistent with this general increased epistemic activity explanation, recent studies have found that perceptual anomalies used in MMM studies improve artificial grammar learning (Proulx & Heine, 2009), which is one sign of greater processing capacity being devoted to incoming information. On the other hand, Trémolière, De Neys, and Bonnefon (2014) have shown that MS improves performance on logical syllogisms when conclusions support one's worldview but inhibits performance when conclusions violate one's worldview. Future research should compare the effects of MS with those of expectancy disconfirmation and perceptual anomalies on these measures of general epistemic activity and the more specific worldview confirming attitudes that are predicted by TMT as one strategy for determining whether the same or different processes are involved in these effects—and how they might be related.

s0135 ### 7.6.4 Death Is Not Living

p0535 We agree that uncertainty about death, lack of clear understanding of what it means, the loss of control that it entails, and the severing of social bonds are among the many reasons that people fear death. Indeed, research suggests that people vary in which aspects of death they report to be most troubling (e.g., Florian & Mikulincer, 1998b). Death is a complex, multifaceted, and very troubling aspect of human existence. TMT maintains that the most basic reason death is upsetting and motivating is because it undermines the most basic motive of all, which is a prerequisite for all other need satisfaction—staying alive. More specifically, death is a unique motivator because: (a) most biological systems function to keep the organism alive, thus averting death; (b) death must be avoided to enhance opportunities for reproduction and care of offspring, both essential for gene perpetuation; (c) death is the only absolutely inevitable future event; and (d) death threatens to undermine all human desires, whether for pleasure, belonging, certainty, meaning, control, competence, self-actualization, or growth. Human beings are the only species sufficiently cognitively complex to be

aware of the inevitability of their own demise and the only species with the cognitive wherewithal to invent conceptions of reality that deny the finality of this fate.

s0140 7.7 Threat-General and Threat-Specific Theories

p0540 The most recent trend in alternatives to the TMT analysis of the role of death in life are models positing very general biological mechanisms through which *all* threats produce their effects (e.g., Jonas et al., 2014; McGregor, 2006; Tritt et al., 2012). These models view all threats as functionally equivalent and posit mechanisms that reduce anxiety produced by perceived discrepancies to explain the effects of all threats and discrepancies. McGregor's (2006) Reactive Approach Motivation (RAM) model was the first of these and seems to be the prototype upon which other models have built. From this perspective, threats of all kinds are reduced to conflicts or discrepancies between actual and expected or desired states, which activate the Behavioral Inhibitory System (BIS; Gray & McNaughton, 2000) and produce a subjective state of anxious uncertainty. The BIS produces an orienting response that disrupts ongoing behavior and motivates efforts to resolve the discrepancy in question. If a resolution of the focal discrepancy is not forthcoming, the RAM model posits a rapid switch to the approach-oriented Behavioral Activation System (BAS) that refocuses the organism toward approaching other goals. This switch to approach motivation is claimed to relieve the distress activated by the original disruption, and thus either resolve the problem or provide a palliative to the distress produced. From the RAM perspective, activation of approach motivation is the central mechanism that resolves the distress produced by all threats, including thoughts of death. Jonas et al. (2014) posit a somewhat different view, with threats activating the BIS so as to facilitate a more rapid return to the BAS and the goal-oriented behavior.

p0545 It seems unlikely to us, though, that there are no meaningful differences in the processes involved in terror management, cognitive dissonance, perceptual discrepancies, and the many other effects that Tritt et al., Jonas et al., and McGregor argue are produced by the same underlying process. There are large and complex literatures surrounding all of these effects that cannot be comprehensively explained by simple alternation between approach and avoidance motivation. For example, there are no theoretical mechanisms in any of these models to explain why choice and foreseeable aversive consequences play a role in dissonance processes or the interplay between worldviews, self-esteem, and attachments in terror management processes. The

different moderating and mediating variables for these effects also suggest that single process models are unlikely to provide adequate explanations. The contents of cognition play important roles that cannot be ignored if one hopes to explain the literature surrounding any of these processes.

p0550 Although proponents of these models offer some evidence of similarity in the neurological correlates of some aspects of some of these effects, the evidence that the processes are the same is far from compelling. For example, Tritt et al. cite evidence suggesting that activation of the right amygdala anterior cingulate gyrus is the common shared neural pathway through which threats produce their effects. But there is also evidence of activation of distinct neural structures in response to MS that does not appear to occur in response to other threats (e.g., Agroskin, Klackl, & Jonas, 2014; Quirin et al., 2012). The literature on neurological underpinnings of these processes is far too tentative to make sweeping generalizations such as these. Even if many of the neurological structures involved in responses to these different types of threats did turn out to share common pathways, it is virtually certain that there are also unique aspects of each, at neural, and all other levels of analysis. Minimally, there must be neurological underpinnings of the contents of consciousness that differentiate the diverse array of events that these models attempt to encompass.

p0555 Turning to the more specific claims of these models, it is implausible that all of the findings from TMT research result from activation of approach motivation. The large literature documenting the tendency of people to move away from reminders of their animal nature when mortality is salient is especially difficult to construe as approach focused: finding the physical aspects of sex less appealing, *withdrawing* from both pleasant and unpleasant physical sensations, *distancing* from a breast-feeding mother, and *avoiding* breast self-examinations (for a review, see Goldenberg, 2012) provide just a few examples. Indeed, many responses to MS involve negative evaluations, derogation, or distancing from a person who is different from oneself or who violates cultural values (e.g., Greenberg et al., 1990). Although threat-general theorists argue that aggression is an approach-oriented behavior, citing Harmon-Jones and Peterson (2008), and this might help account for findings in which MS increases actual aggression (McGregor et al., 1998), it is a major stretch to construe all negative evaluations as approach oriented. MS has also been shown to increase distress when handling a flag or crucifix disrespectfully (Greenberg et al., 1995), distancing from one's own ethnic group (Arndt et al., 2002), disdain for abstract art (Landau et al., 2006), opposition to immigration (Weise, Arciszewski, Verlhiac, Pyszczynski, &

Greenberg, 2012), derogation of a sexually provocative woman (Landau et al., 2006), and giving harsher punishment to a moral transgressor (Florian & Mikulincer, 1997), none of which can easily be construed as approach-motivated behavior.

p0560 Taken literally, the RAM model predicts the opposite of what was found in all these studies. Perhaps proponents would argue that these cases of overt avoidance involve upholding values or standards of some sort, and that the apparent avoidant nature of these attitudes and actions is ultimately serving approach motives. But this sort of argument would obscure any meaning or utility of the distinction between approach and avoidance, and illustrates the looseness and inability to generate *a priori* predictions from this perspective. It's hard to imagine how a theory that views activation of approach motivation as the proximal source of relief from threat could generate any of the predictions made by TMT, or any *a priori* predictions regarding specific responses to particular threats (cf. Shepherd, Kay, Landau, & Keefer, 2011).

p0565 It is also important to recognize that most, if not all, behavior involves simultaneous activation of both approach and avoidance systems. For example, theory and research (Wegner, 1994) suggest that suppressing unpleasant thoughts (avoidance motivation) entails the generation of distractions (approach). And pursuing most goals requires simultaneous avoidance of appealing impediments to approaching the goal (Kuhl & Beckman, 1985)—as when avoiding extreme statements in order to craft a convincing argument. Similarly, the proximal and distal defenses documented in the TMT literature seem to involve coordinated activation of both approach and avoidance motivation, as in the case of the proximal defense of intending to go to the gym to exercise and the distal defense of supporting war to eliminate an enemy. Although one can assess the relative activation of brain regions more associated with approach or avoidance, it is important to realize that most if not all behavior involves a blend of both approach and avoidance, and presumably activation of brain centers involved with both.

p0570 Tritt et al. (2012) argue that it is likely that the systems for responding to complex abstract threats evolved in a way that built on earlier more primitive systems for coping with more concrete threats. This is a good point with which we concur. Although our original conceptualization of TMT didn't address the precursors upon which the terror management system was built, we never claimed that it emerged out of nowhere; we provided a more thorough discussion of possible scenarios through which these processes might have emerged among our ancestors in Pyszczynski and Kesebir (2012), Pyszczynski et al. (2014), and Section 5.4. Au26

p0575 Our perspective differs from that of Tritt et al. in placing much greater emphasis on human innovation, cultural evolution, and the specific contents of conscious and nonconscious ideation. Modern humans' approach to dealing with death builds on the approach our ancestors invented that has been passed down and modified over the millennia by further human innovations that became institutionalized in our cultures. These cultural innovations changed the environment to which human brains must adapt and thus likely affected biological evolution as well. Importantly, though, being built upon more primitive adaptations in no way implies that the terror management system is the same as the various other systems that also built on these earlier adaptations.

p0580 These general threat-compensation models are conceptualized at a different, more concrete, level of abstraction than TMT, focusing on neurological underpinnings and biological processes. For example, Tritt et al. (2012, p. 716) describe their model as a "biologically informed, mechanistic elucidation of threat-compensation processes" that provides an improvement over the "meta-physical explanations" (p. 727) provided by TMT. Beyond the apparent misunderstanding of the term "meta-physics," these authors conflate reductionism with science. As many others have pointed out before us, psychological processes cannot be reduced to or explained by their neurological substrates (see, e.g., Jaynes, 1976). And although progressing at an impressive pace, current understanding of how neurological locations and events relate to psychological processes involving meanings and behavior is still in its infancy and far from able to produce confident conclusions regarding subtle distinctions in meaning, beliefs, or values.

s0145 8. ISSUES FOR FUTURE RESEARCH AND THEORY DEVELOPMENT

p0585 Although there are many issues for which further research and theoretical specification are needed, here we briefly discuss what we see as some of the most pressing ones.

s0150 8.1 The Relation Between Thoughts of Death and Other Threats

p0590 The biggest point of contention between proponents and critics of TMT is how the problem of death relates to other threats. We presented our analysis of this relation and discussed the major problems with alternative accounts in previous sections. But there is still much to be learned about this relation.

Perhaps the most pressing question is whether the mechanism through which MS produces its effects is the same as those invoked by other threats. Although the evidence is mixed as to whether other threats produce the same or different effects as MS, and there is compelling evidence that MS effects are at least partially mediated by DTA, the mechanisms through which other threats produce their effects is less clear. What role, if any, does DTA play in these other effects? If DTA does not mediate them, does increased accessibility of thoughts about these other threats play a role? If so, do defensive responses reduce the accessibility of those thoughts, as they do for death-related thoughts? Or are responses to other types of threats the result of a general increase in epistemic activity that spills over to the domain in which effects are assessed?

p0595 A related question is whether the time course for responses to other types of threats is the same or different from that typically found for MS—and, if not, what that tells us about the process. Because some level of delay and distraction has been included in most studies of the effects of other threats, it is unclear whether similar or different effects emerge immediately after exposure to them. Recent research also shows that threats to meaning increase DTA and worldview defense only when they produce increases in self-reported negative affect (Weber, Zhang, Schimel, & Blatter, 2015). Studies directly comparing the immediate and delayed effects of MS and various other threats on DTA, the accessibility of other relevant cognitions, affect, and defensive responses would be especially useful for addressing this question.

p0600 A related question concerns the growing body of research documenting effects of thoughts of threatening events that are directly associated with death but also involve other threatening content, often of a political or ideological nature. For example, it has been shown that reminders of terrorist attacks (e.g., Landau et al., 2004), bombed out buildings (Vail, Arndt, et al., 2012; Vail, Juhl, et al., 2012), nuclear accidents (Selimbegović, Chatard, Er-Rafiy, & Pyszczynski, 2014), natural disasters (Kesebir & Pyszczynski, 2014), and the Holocaust in Nazi Germany and Japanese occupation of Korea (e.g., Hirschberger, Lifshin, Seeman, Ein-Dor, & Pyszczynski, 2014) produce increases in various forms of worldview defense similar to that produced by MS. Some of these studies show that thoughts of these events also increase DTA (e.g., Landau et al., 2004); one showed that defense was mediated by DTA, but another did not find such mediation (Selimbegović et al., 2014). Although we suspect that death-related ideation is part of what drives these effects, these other threats are likely to also

activate thoughts and emotions regarding the specific type of event in question. As Arndt et al. (2002) have shown, other thoughts activated along with those directly related to death appear to influence the specific domains from which security is sought. Specification of the dynamics of these processes is an important issue for further theory development and research.

s0155 8.2 Variations in How Death Is Construed

p0605 Because TMT emphasizes the role of unconscious death-related ideation, we've tended to assume that it is simply the idea of death or nonexistence from which people must defend themselves. The fact that in our first few studies, we attempted but did not find relations between the content of participants' responses to the open-ended MS manipulation and the level of worldview defense they exhibited supported this assumption; so we soon stopped looking for such relations. But failing to find effects does not mean they do not exist. More recent findings of cultural differences in some aspects of responses to death-related thoughts have led to us to think about the possibility that different ways of construing death have different consequences. Indeed, Eastern religions often view life and death as part of the same process and advocate accepting one's mortality as a major spiritual task. In a related vein, many (but certainly not all) patients with terminal diseases report having made peace with their mortality, and research has shown that older adults generally report less fear of death than middle-aged persons (Fortner & Niemeyer, 1999) and that older adults with high levels of executive functioning do not show the harsher responses to moral transgressors and worldview criticizers that younger persons do, though they are still affected by them (e.g., Maxfield et al., 2007). This suggests that investigating the consequences of different ways of construing death may be a fruitful avenue for future research.

p0610 Recent studies conducted in the Netherlands (Doojse, Rutjens, & Pyszczynski, 2015) show that a substantial minority of participants report feelings of acceptance or curiosity when reminded of death and that these responses are associated with lower levels of worldview defense. Follow-up experiments showed that MS inductions that encourage participants to think about death with acceptance or curiosity eliminate the effects found with the more typical open-ended MS induction, and also increase organ donation willingness. This line of research raises the question of whether such inductions actually eliminate death-related fear, albeit temporarily, or if these ways of thinking about death are a particularly effective way of

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defending against it. Interestingly, Abdollahi (2006) began his exploration of terror management processes when he noted that many of the Muslim students in his classes responded to his presentation of TMT by insisting that they actually look forward to death because of the paradise that they were certain would follow; similar responses are sometimes found in American students' responses to MS in our own studies. Despite this, Abdollahi (2006) replicated five different types of defensive responses to MS among Iranian students and community dwellers. This suggests that the relation between conscious construal of death and how it affect one's behavior is likely a complex one—and certainly worthy of additional investigation.

s0160 8.3 Where Will People Turn for Protection?

p0615 TMT posits that people protect themselves from death-related anxiety by maintaining faith in and living up to the standards of their cultural worldviews. But cultural worldviews are complex, multifaceted constructions that each person abstracts from the diverse range of information to which they are exposed and experiences they have over the course of their lives. What determines which of these diverse worldview elements a person will turn to for protection in any given situation? This question is at the root of the discussion over whether MS produces a shift toward conservative and dogmatic attitudes, which tend to provide high levels of structure and certainty, or toward one's preexisting worldview, which presumably was adopted because of the security it provides (e.g., Anson et al., 2009; Jost, Fitzsimons, & Kay, 2004).

p0620 It has already been well established that individual differences in worldview and sources of self-esteem, along with recent priming of specific worldview elements, are important predictors of these responses. We have also assumed that the relative importance of particular beliefs and values to one's worldview is a major determinant. But a more precise conceptual answer to this question would be that people gravitate toward whatever worldview elements are most associated with safety and security. This probably depends on features inherent in the worldview element as well as one's socialization history with respect to the diverse teachings of one's culture. For example, research shows that behaviors related to morality are especially important determinants of how people evaluate both self and others (e.g., Skitka et al., 2005). We suspect this is because most cultures teach that one's moral actions are the most important, if not the only, factor that determines one's eligibility for literal immortality. It is also likely that one's parents,

significant others, and the culture at large place different emphasis on particular beliefs and values, which influences the extent to which one relies on them for security. A reliable way of measuring or manipulating the security value of particular worldview elements would be an important step toward making more precise predictions about where people will turn for protection when existential threat is heightened.

s0165 8.4 Alternate Ways to Feel Protected from Death

p0625 Related to the issue of how a given individual will respond to the threat of mortality is the nature of the interplay between different forms of immortality striving. The first elaborate written story, *The Epic of Gilgamesh*, concerned Gilgamesh's search for immortality through an afterlife, through an elixir that eliminates death, and through accomplishments that yielded lasting fame. And humans have been seeking literal immortality, eternal life without death, and symbolic immortality ever since.

p0630 TMT and research have focused primarily on striving for literal and symbolic immortality, and found plenty of evidence for both. In addition, Dechesne et al. (2003) demonstrated that increased confidence in literal immortality reduces self-esteem striving in response to reminders of death. Furthermore, recent studies (Lifshin, Weise, Soenke, & Greenberg, 2015) have shown that literal immortality via an immortal soul reduces defensive reactions to the prospect of humanity becoming extinct. These findings suggest that these two forms of immortality belief can substitute for each other.

p0635 Recently, we have started to examine Gilgamesh's third plan for immortality, finding a way not to die. Indeed, recent advances in understanding the biological processes through which death occurs have made it now possible to resuscitate people up to 4 h after clinical death (Parnia, 2013). Biologists have been making strides toward the possibility of indefinite life extension (ILE) by increasing our understanding and hopefully eventually controlling the biological processes that produce aging (De Grey & Rae, 2008). While debates rage about the feasibility and desirability of ILE, we have begun to study the psychological impact of considering this as a plausible possibility. Preliminary findings suggest that: as investment in literal immortality beliefs increases, support for ILE decreases; American males are generally more on board the ILE train, whereas women are more supportive of literal immortality; if ILE is presented as plausible, people tend to become less invested in literal immortality beliefs; MS increases people's ambivalence about life-extending technologies, making them both view them as more plausible

and have more doubts about the objectivity of the scientists exploring these ideas. These studies just scratch the surface of the ways in which hopes of ILE, literal, and symbolic immortality may interact. As we approach this brave new world, we believe it is important to continue assessing the relations among these approaches to quelling the terror of death.

s0170 8.5 Variation in Anxiety-Buffer Functioning and Psychological Disorder

p0640 The TMT analysis of psychological dysfunction posits that ineffective anxiety-buffer functioning is responsible for many psychological disorders, and research has shown that PTSD and depression are associated with the absence of normal defenses to MS (Pyszczynski & Kesebir, 2011; Simon, Arndt, Greenberg, Pyszczynski, & Solomon, 1998). But it has yet to be determined whether these atypical responses are directly related to an overabundance of anxiety or the specific psychological symptoms that we claim are driven by this lack of protection. There is some evidence that people with phobias and obsessive–compulsive tendencies exhibit these symptoms to a greater extent after being reminded of their mortality. But these studies reflect only a few disorders directly related to anxiety—are other dysfunctional behaviors the result of ineffective terror management? And many questions remain about the antecedents and consequences of such dysfunctional responses to threat. It also seems likely that people without symptoms of significant psychological disorders vary in the effectiveness of their anxiety-buffering system. New strategies for assessing and manipulating anxiety-buffer effectiveness are needed to further research on these issues.

s0175 8.6 Better Modes of Dealing with Death?

p0645 From the perspective of TMT, the fear of death is a universal aspect of human experience, as is the system of managing it through worldviews, self-esteem, and close interpersonal attachments. But as documented in diverse lines of research, there is considerable variability in how individuals within and across cultures approach this problem. Although we claim that some version of a system for managing the fear of death is present in all cultures and passed on to children through the socialization process, we suspect that some people transcend the anxiety-buffering systems of their cultures and find new, perhaps better, ways of dealing with the problem of death. Finding better ways to live life without fear or its troublesome consequences has been the explicit goal of all religions and many philosophies probably

since the earliest days of our species. This elusive goal continues to be pursued today, in the form of psychotherapies, programs for psychological harmony, spiritual growth, and self-actualization. Perhaps the ultimate question for future exploration regarding the existential quagmire of mortality is whether any of these practices actually help, and, if so, how they do so.

s0180

9. CONCLUSION

p0650

TMT has come a long way over the past 30 years. Both terror management research and the number of researchers contributing to it have been increasing exponentially in the last decade (see tmt.missouri.edu). In fact, when we entered "terror management" in a Psych Info search, we were startled to find, from January 2014 to January 2015 alone, 53 publications (excluding dissertations). Although a handful of these were not empirical papers, these publications reported a total of 83 supportive studies! Clearly, to paraphrase a popular paraphrase of Mark Twain, "rumors of TMT's death are greatly exaggerated." The theory and associated research programs continue to engage the interest of scholars in myriad academic disciplines; generate testable hypotheses that produce empirical findings in accord with theory; widen the scope of conceptual domains to which TMT is now applied (e.g., law, consumer behavior, political preferences, robotics); and advance the ongoing refinement of the theory in light of novel empirical findings. Like all theories, there will come a time when TMT will be supplanted by a more potent theoretical perspective, but in the meantime, the theory is continuing to contribute to progress in understanding important aspects of human behavior.

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Non-Print Items

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