Death and Black Diamonds: Meaning, Mortality, and the Meaning Maintenance Model

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The Meaning Maintenance Model (MMM; Heine, Proulx, & Vohs, 2006) proposes that human beings innately and automatically assemble mental representations of expected relations. The sense of global meaning that these relations provide is regularly disrupted by unrelated or unrelatable experiences, which elicit feelings of meaninglessness. People respond to these disruptions by engaging in meaning maintenance to reestablish their sense of symbolic unity. Meaning maintenance often involves the compensatory reaffirmation of alternative meaning structures through a process termed fluid compensation. The MMM proposes a fundamental reinterpretation of the social psychological literature, arguing that meaning maintenance is a general mechanism that underlies a host of diverse psychological motivations, including self-esteem needs, certainty needs, and the need for symbolic immortality. In particular, the MMM stands in contrast to Terror Management Theory in that mortality salience is explained by the MMM to be one of many specific instantiations of threats to meaning that engenders fluid compensation.

If one were to sift through the annals of 20th-century social science and make an inventory of the most important works yet published on meaning, one might include Frankl's *Man's Search for Meaning* (1946), Freud's *Civilization and Its Discontents* (1930/1991), Maslow's *Toward a Psychology of Being* (1962), Rogers' *A Way of Being* (1980) or Becker's *Denial of Death* (1973). One might also include a short paper by Jerome Bruner and Leo Postman in an issue of the *Journal of Personality* from 1949, titled "On the perception of incongruity: A paradigm." Originally cited in *The Structure of Scientific Revolutions*, Thomas Kuhn (1962/1996) argued that this study exemplified the manner in which academics construct and defend their own meaning systems, and the manner in which human beings construct and defend systems of expected cognitive associations, in general.

It's About Playing Cards.

What is common knowledge about playing cards? Fifty-two cards, four suits, two colors. One expects red to be associated with diamonds, and black to be associated with clubs. But what if they're not? What if the diamonds are black, or the clubs are red? What if one is presented with absurd cards whose associated features violate the playing card paradigm, the existing system of expected associations that one imposes on subsequent experiences of playing cards? According to Bruner and Postman (1949), most people will implicitly engage in one of two cognitive processes: either

they reinterpret their perception of the playing cards such that they seem to agree with the existing paradigm (i.e., they "see" a black diamond as red) or they revise their existing paradigm such that it now includes the unexpected playing card associations (i.e., they allow that diamonds may also be black).

Curiously, many of Bruner and Postman's (1949) participants were said to experience "acute personal distress" (Kuhn, 1962/1996, p. 63), with one participant exclaiming "I can't make the suit out whatever it is. It didn't even look like a card that time. I don't know what color it is now or whether it's a spade or a heart. I'm not even sure what a spade looks like. My God!" (Bruner & Postman, 1949, p.181). If one grants that some participants experienced anxiety in the face of these trivial anomalies, one might well wonder how some individuals might react to more damaging assaults on the integrity of paradigms that govern constructs of much greater import than a deck of cards.

What about the other paradigms that govern the perceptions of people, places and events that people experience everyday, paradigms that govern their relation to these experiences, and paradigms that constitute what it means to be a self at all? What if these systems of expected associations, these *meaning* frameworks, were threatened by experiences that likewise brought them into question: clocks running backward, feeling alienated from lifelong friends, bad things happening to good people, or what Heidegger (1953/1996) called "our ownmost nonrelational potentiality-of-being" (p. 251), and what the rest of us call death. In fact, it was the central conceit of existential philosophers that any

breakdown in expected associations, whatever its source, has the potential to provoke existential anxiety. This "feeling of the absurd" (Camus, 1955, p.22) provoked by the meaninglessness of death does not differ in kind (although, it surely differs in magnitude) from the meaninglessness elicited by a black queen of diamonds.

The Meaning Maintenance Model (MMM) elaborates on this existential hypothesis, proposing that human beings innately and automatically assemble mental representations of expected relations, systems that they strive to make coherent and consistent (for a more in depth discussion, see Heine, Proulx, & Vohs, 2006). Often, the sense of symbolic unity that these relations provide is disrupted by experiences that undermine their integrity, prompting people to reaffirm alternative meaning structures and thereby reestablish their sense of symbolic unity by means of a process termed *fluid compensation*. The MMM proposes that meaning maintenance is a general motivational mechanism, and that Terror Management Theory (TMT) is one of many substitutable content-specific instantiations of this mechanism, one in which a meaning framework is reaffirmed (cultural worldview defense) in the face of a disruption in meaning (mortality salience), thereby restoring a sense of symbolic unity (symbolic immortality).

Meaning and Mortality

Why do people construct worldviews? Is it to assuage anxiety about their mortality, or is it to provide them with a sense of meaning? Which terror comes first: the fear of death, or the fear of meaninglessness? Do people only fear death insofar as death renders life meaningless, or do they only bother with meaning insofar as meaning may grant them symbolic immortality? If one looks to the relevant social psychological literature, TMT (for a review see Pyszczynski, Greenberg, & Solomon, 2004) has done an exemplary job of theoretically articulating and empirically supporting the claim that the primary purpose of humanity's meaning-making motivations is to quell the anxiety that arises from their awareness of their inevitable death. In over 175 published studies, we have seen that simply reminding people of their own death elicits a wide range of meaning bolstering responses, from increased derogation of criminals to increased donations to charity.

We argue, however, that all of the documented responses to mortality salience are specific instantiations of a general meaning maintenance phenomenon, insofar as mortality salience represents one specific disruption to people's existing meaning frameworks (albeit an all-encompassing, uniquely catastrophic disruption). Although people may compensate for this disruption by reaffirming other, existing meaning frameworks (the well established phenomenon of cultural worldview defense; Pyszczynski et al., 2004), a growing body of work in social psychology already suggests that death is not the only meaning framework disruption that elicits a similar reaffirmation of meaning. Although "terror management theory is essentially a theory about the effect of death on our lives" (Pyszczynski, Solomon, & Greenberg, 2003, p. 8), the MMM presents a theory that not only accounts for the behavioral phenomena associated with death, but a host of social psychological motivations, including self-esteem needs, certainty needs, and the need for symbolic immortality.

What is Meaning?

If meaning maintenance lies at the heart of these diverse phenomena, it follows that whatever meaning is, it must be a broad, practically all-encompassing psychological construct. Actually, this is very much the case, and it should therefore be of little surprise that it is already well entrenched in the psychological literature, ubiquitous across disciplines, albeit hidden within the current psychological nomenclature. Whatever it happens to be called, *meaning* means the same thing: mental representations of expected relationships.[1] These mental representations encompass anything that one might expect to be related to anything else—people, places, objects, events—in any way that they could be construed as related—causally, spatial-temporally, teleologically. When individuals encounter something, anything, that is not currently related to an existing framework of relations, it said to be meaningless; it only becomes meaningful once a relationship, any manner of relationship, is discovered or imposed.

The discussion of meaning as relation began with Aristotle (350 BCE/1987), who claimed that all manner of associations, regardless of what they are associating, can be reduced to four familiar classes: contiguity, contrast, frequency, and similarity. Although subsequent Western thinkers expanded and explored this metaphysical understanding of association, it wasn't until the mid–19th Century that the emerging Existentialist movement would shift the focus to the psychological experience of meaning. According to existentialist theorists (Camus, 1955; Heidegger, 1953/ 1996; Kierkegaard 1843/1997, 1848/1997; Sartre, 1957/

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[1]Of course, not all associations are meaningful, insofar as not all associations are expected. Kierkegaard (1843/1997) coined the now familiar expression "absurdity" (p. 97) to describe unexpected associations. The Surrealist movement, from Meret Oppenheim's "Fur Teacup and Spoon" (1913), to David Lynch's "Mulholland Drive" (2001), has spent the better part of the century eliciting that "uncanny" (Freud, 1925/1990, p. 339) feeling that people often experience in the face of absurdity.

1992), the desire of philosophers, scientists, and theologians to understand reality as a series of coherent, internally consistent relations is indicative of a fundamental human proclivity to organize their experiences into systems of expected relations, and to experience anxiety if these relations are threatened.

Gradually, the emerging field of psychology began to discuss the human experience of meaning (Ebbinghaus, 1885; James, 1890), and in 1932 Fredrick Bartlett's *Remembering* introduced an expression that would eventually supplant the existential term *meaning* and achieve universal familiarity and acceptance for psychologists through to the present day: the *schema*. Camus's (1955) "systems of relations" (p.13) became *schemata* (Markus, 1977; Piaget, 1960). Where Kierkegaard (1848/1997) described the self as a "relation that relates itself to itself, and in relating itself to itself, relates itself to another" (p. 351), Markus & Wurf (1987) discussed *self-schemas*. Heidegger's (1953/1996) "the they" (p. 114) became *social schemas* (Kuethe, 1962), *person schemas* (Horowitz, 1991), and *relational schemas* (Baldwin, 1992). Implicit meaning frameworks governing perception became *paradigms* (Bruner & Postman, 1949), and (inevitably) *perceptual schemas* (Intraub, Gottesman, & Bills, 1998). The only mode of relation for which psychologists tend to retain the word *meaning* are teleological relations, where systems of purpose or value associations are seen to comprise global meaning (Park & Folkman, 1997) worldviews (Pyszczynski et al., 2004; Thomson & Janigan, 1988), and assumptive worlds (Janoff-Bulman, 1992).

Why Do People Look For Meaning?

Although there is methodological utility in breaking meaning down into its specific of applications and associated schemata (Markus, 1977), a fundamental premise of the MMM is that all mental representations of expected relations, wherever they are applied, constitute domain specific instantiations of the same general impulse to create meaning. We submit that the universal human proclivity to generate and apply mental representations of coherent, consistent, expected relations represents an attempt to maintain a sense of symbolic unity.

Although Existentialism was the first western school of thought to imagine humanity's proclivity for divining and applying "*eternal relations*" as a discrete impulse, one of such importance as to be deemed "the fundamental impulse of the human drama" (Camus, 1955, p. 13), other, increasingly divergent, thinkers would theorize on the origin of such an impulse (Freud 1930/1991; Fromm 1941/1958; Piaget, 1960). Despite their various theoretical commitments, each of these theorists reached a similar conclusion; throughout in-

fancy, humans don't individuate self from other, or more generally, anything from anything else. The attendant "oceanic feeling" (Freud 1930/ 1991, p. 252) is henceforth associated with security and well being, and constitutes a state that people implicitly and eternally long to re-experience. This "nostalgia for unity" (Camus, 1955, p. 13) is seen to underlie religious impulses, from animism to Zoroastrianism, and more generally, efforts to establish consistent and coherent relations that unify our own selves, the people, places, and events that constitutes the world beyond ourselves, and that ultimately unify ourselves with the world beyond around us.[2] The echoes of this symbolic unity, can be heard in equilibrium (Piaget, 1960), a need for coherence (Antonovsky, 1979), the unity principle (Epstein, 1981), a need for structure (Neuberg & Newsom, 1993) cognitive dissonance (Festinger, 1957) a need for cognitive closure (Kruglanski & Webster, 1996), worldview defense (Pyszczynski, Greenberg, & Solomon) and uncertainty management (Van den Bos, Poortvliet, Maas, Miedema, & Van den Ham, 2005).

Meaning frameworks begin as prelinguistic networks of related propositions (Bruner, 1990), and the cognitive mechanism that establishes systems of expected associations is active from the moment of birth (Walton & Bower, 1993). Human infants innately and automatically distinguish complex patterns of associations in visual (Kirkham, Slemmer, & Johnson, 2002) and auditory stimuli (Aslin, Saffran, & Newport, 1998; Gomez & Gerken, 1999; Saffran, Aslin, & Newport, 1996; Saffran, Johnson, Aslin, & Newport, 1999). Over time, these observed regularities in our environment form the basis for complex systems for relations that we subsequently come to implicitly expect. As our cognitive capacity increases, this innate associative mechanism is applied to increasingly complex elements of our internal and external environments, resulting in mental representations of expected relations that become broader in scope (Murphy & Medin, 1985) and more abstract (e.g., emerging self-concepts; Harter, 1996; a theory of mind; Tomasello, Kruger, & Ratner, 1993).

One can imagine that the uniquely human capacity[3] to abstract, construct, and expect relatively complex systems of relations serves an adaptive evolutionary function, insofar as these implicit associations focus our attention and allow for the encoding and retrieval of subsequent experiences (Wyer, Bodenhausen, & Srull, 1984), provide a basis for predicting and controlling our internal and external environments (Baumeister, 1991; Lerner, 1998), help us to cope with tragedy and trauma via teleological validating contexts (Vallacher & Wegner, 1987), allow for the formation

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[2]These general domains of meaning mirror the tripartite distinction found in *Being and Nothingness* when Sartre (1957/1992) classed association into *man*, *the world*, and *man–world*.

and transmission of culture (Tomasello et al., 1993), and the symbolic cheating of death via adherence to the enduring values that these cultures provide (Pyszczynski et al., 2004). Although meaning allows for these and many other functions, we submit that meaning maintenance, in general, does not reduce to any one of these functions in particular, any more than people's capacity for memory, in general, reduces to the ability to remember where they can find some dinner, in particular. Maintaining a sense of symbolic unity is the goal of meaning maintenance, while meaning maintenance itself serves as a means to achieving many other goals.

How Do We Maintain Meaning?

Theories of about how people acquire and maintain meaning are often elaborations on well established revise or reinterpret models (Janoff-Bulman, 1992; Park & Folkman, 1997; Piaget, 1937/1954; Thomson & Jannigan, 1988). However elaborate these models become, they generally reduce to a series of relatively simple propositions. Over the course of our lives, we are bombarded with novel, unexpected experiences that are not yet related to existing mental representations of expected relations, or that imply or elicit incoherence or inconsistency within an existing system of relations. People term these experiences meaninglessness. In response to meaninglessness, individuals may revise their mental representations (e.g., A black queen of diamonds? I guess some diamonds are black. Bad things happening to good people? I guess bad things happen to everyone.), or we may reinterpret the meaningless experiences such that it can be construed as already being related to our existing mental representations, and therefore as already meaningful (e.g., A black queen of diamonds? I see it as red. Bad things happening to good people? It was actually a good thing because it made them stronger.).

In addition to the well-elaborated processes of revision and reinterpretation, the MMM proposes a third process, a third *R* that restores a sense of symbolic unity. In the face of meaninglessness, people often reaffirm other, nondirectly related, and therefore undamaged, mental representations of expected relations to temporarily restore their sense of symbolic unity. Via a fluid compensation process, stable systems of expected relations are behaviorally reaffirmed, where these expected relations may lie within the same general domain of experience as the threatened relationships, or within other, seemingly unrelated systems of relations.

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[3]William James (1890) famously explored the capacity for contiguous abstraction by suggesting that, for himself, a sunset may mean the death of a hero, but for his dog it can only mean dinnertime.

Evidence for the MMM

The core premise of the MMM is that people will reaffirm alternative meaning frameworks through fluid compensation when their present meaning framework is disrupted. Because this process is fluid, we should be able to identify evidence of meaning reaffirmation efforts in domains that are far removed from the original source of the threat. In the following section, we consider some evidence for this fluid compensation.

Self-Esteem

One source of disruption to meaning frameworks is a threat to self-esteem. Self-esteem threats suggest that a person is not able to functionally relate to their environment. As such, when encountering such threats the MMM proposes that people should be motivated to seek alternative meaning frameworks that can reestablish effective relations between their selves and their environments. Likewise, boosts to self-esteem suggest that a person is engaging effectively with their environment, and these should serve to diminish the impact of other meaning threats. A variety of research programs have documented these kinds of hydraulic reactions to self-esteem threats and boosts.

First, consider the diverse array of reactions that have been documented for people experiencing a threat to their self-esteem. For example, Hogg and Sunderland (1991) found that participants who received failure feedback on a word association task demonstrated greater intergroup discrimination than those who had received success feedback (also see Brown, Collins, & Schmidt, 1988). That is, when participants encountered a meaning threat in terms of their self-esteem being threatened, they responded by striving to increase a sense of order in their world through intergroup discrimination. Cialdini et al. (1976) found that when participants' self-esteem was threatened by failing a trivia test they responded by being more likely to affiliate themselves with their school's winning football team (and distancing themselves from a losing team). Baumeister and Jones (1978) found that when people received negative personality feedback in one domain, they bolstered their self-assessments in unrelated domains. Tesser and colleagues (Tesser, Crepaz, Beach, Cornell, & Collins, 2000) found that people who have had their self-esteem threatened by writing a counterattitudinal essay or by making negative social comparisons were more likely to affirm unrelated values.

In contrast, boosts to self-esteem appear to reduce the impact of other kinds of meaning threats. For example, whereas making close-call decisions typically arouses dissonance and represents a threat to one's self-integrity, dissonance reduction efforts are no longer evident if people have been given a chance to affirm their values (Steele, Spencer, & Lynch, 1993), wear a

coveted lab coat (Steele & Liu, 1983), receive favorable personality feedback (Heine & Lehman, 1997), or focus on a positive social comparison situation (Tesser & Cornell, 1991). Similarly, boosts to self-esteem have been shown to eliminate the effects of mortality salience, both on death thought accessibility and on worldview defense (Harmon-Jones et al., 1997; Mikulincer & Florian, 2002).

Uncertainty

A second source of disruption to a sense of meaning is feelings of uncertainty. When people feel certain, they have the sense that their framework of expected relationships is internally consistent, fits with their perceptions, and allows them to feel that they can predict and control events in their lives. Uncertainty calls all of this into question. Much research has explored the diverse reactions that people have to feelings of uncertainty.

For example, McGregor, Zanna, Holmes, and Spencer (2001) found that when participants were made aware of an inconsistency in their lives, they responded by becoming more rigid in their beliefs about unrelated topics. Thus, people compensated for a manifestation of meaningless in one domain by reaffirming meaning in another (also see McGregor & Marigold, 2003). Grieve and Hogg (1999) found that participants who were made to feel uncertain in one task responded by striving to impose a sense of order in a second task by showing heightened intergroup discrimination. Van den Bos and colleagues (Van den Bos & Miedema, 2000, 2003; Van den Bos et al., 2005) found that feelings of uncertainty led people to be more upset about unfair treatment in an unrelated domain (unfair treatment challenges one's expected relationships between behaviors and outcomes).

Similarly, people who are chronically high in the need for nonspecific closure, or people for whom a high need for closure has been induced, engage in a variety of tactics to compensate for the sense of meaninglessness evoked by feelings of uncertainty (for reviews, see Kruglanski & Webster, 1996; Webster & Kruglanski, 1998). For example, Kruglanski and Webster (1991) found that experimentally elevating a need for nonspecific closure resulted in participants rejecting someone who possessed an opinion different from the participants' group (also see Kruglanski & Freund, 1983). Shah, Kruglanski, and Thompson (1998) found that a heightened need for closure leads to more pronounced ingroup biases. Likewise, research by Doherty (1998) found that people reacted to a woman who deviated from cultural norms more negatively if they had been encouraged to reach cognitive closure. Dijksterhuis, Van Knippenberg, Kruglanski, and Schaper (1996) found that people who were chronically high in need for closure, as well as people for

whom a need for closure was induced, exhibited more evidence for relying on stereotypes (which also serve to impose order on the social world).

Research on TMT, of course, provides much evidence for fluid compensation in response to meaninglessness, where, in this case, meaning in threatened by an event (death) that represents a simultaneous breakdown in all of the expected relationships that comprise the self and that bind the self to the outside world. People are, therefore, more likely to pursue various strategies to enhance or maintain self-esteem following mortality salience (e.g., Greenberg et al., 1992; Mandel & Heine, 1999). For example, the self-serving attributional bias becomes more pronounced after mortality salience (Mikulincer & Florian, 2002). Likewise, a desire for certainty increases following mortality salience (Deschene, 2002; Landau et al., 2004; Van den Bos, 2001; Van den Bos & Miedema, 2000). For example, Dechesne and Wigboldus (2001) found that participants who were reminded of their own mortality were quicker to discern a pattern amongst a set of letters relative to those who were not so reminded. Also, belongingness needs are affected by mortality salience manipulations. A number of studies have found that mortality salience prompts affiliative tendencies (e.g., Mikulincer, Florian, & Hirschberger, 2004; Pyszczynski et al., 1996). For example, Wisman and Koole (2003) found that mortality salience manipulations led people to prefer to sit in a group than to sit alone, even when members of the group endorsed beliefs that were antithetical to participants' own beliefs. In sum, much evidence reveals that people will respond to threats to the self by bolstering alternative meaning frameworks that are far removed from the original source of threat.

What is the Incremental Value of the MMM Over TMT?

We find TMT to be a compelling and influential model and think that it is perhaps the best thing to happen to social psychology since cognitive theory. TMT has proved itself to be a remarkably powerful theory, generating all sorts of novel and counterintuitive hypotheses that have been supported in dozens of different papers. The theory has been used to unite formerly disparate disciplines, and it can perhaps explain more phenomena than any other theory in social psychology. Given that TMT has been so influential and generative, we must question the value of considering an alternative theory. This question is all the more urgent because the MMM is similar to TMT in so many ways. Both theories maintain that existential anxiety leads to worldview-bolstering responses, both view mortality salience as a key source of such anxiety, and both theories emphasize how fluid people's attempts to restore

meaning can be. Furthermore, the two theories make the same predictions for all the published findings of TMT. Given this high degree of overlap, and TMT's proven track record, why should anyone seriously consider the merits of the MMM?

Despite the common ground between the two theories with regards to their predictions for responses to mortality salience, the MMM and TMT differ fundamentally in their motivational ontologies, and in the range of findings that they can satisfactorily explain. TMT proposes that thoughts of death provoke anxiety by reminding people of their own mortality. In an effort to avoid this anxiety, people strive for a sense of symbolic immortality, which they achieve by bolstering the structure within which they exist, or their value within that structure. Symbolic immortality is said to be derived from the activation of the dual component anxiety buffer because the structure is perceived to have a sense of permanence, and one can become symbolically associated with this permanence by perceiving oneself as a valued part of this structure (e.g., Pyszczynski et al., 2004; Solomon, Greenberg, & Pyszczynski 1991). The origin of a diverse array of motivations can thus all be traced back to the foundation of fears of one's mortality.

In contrast, the MMM proposes that people have a fundamental need to maintain viable mental representations of expected relationships, that is, meaning. Anything that challenges one's sense of meaning will lead to efforts to construct or affirm different frameworks of meaning. Mortality salience is one experience that disrupts an individual's meaning framework; however, the proposed model predicts that other threats to meaning (such as feelings of uncertainty, self-esteem threats, social rejection, feelings of meaninglessness, alienation, black diamonds) would yield comparable efforts to regain meaning. Ultimately, then, the MMM proposes that the origin of many social motivations are traced back to the foundation of humanity's desire to maintain coherent mental representations of expected relationships. To the extent that the MMM is correct in this reasoning, it then follows that, although TMT has identified a powerful relation between thoughts of one's mortality and worldview-bolstering responses, its explanation for those responses is ultimately wrong.

The MMM offers some falsifiable predictions that distinguish it from TMT. Unlike TMT, the MMM proposes that any significant threats to meaning that do not invoke thoughts of death would also elicit worldview-bolstering responses. Recently, a number of research programs have explored whether non-death-related meaning threats yield similar responses as manipulations of mortality salience.

In one direct series of tests of the MMM, Heine, Proulx, MacKay, and Charles (2007) provided participants with feedback, via a rigged questionnaire, that their life was low in meaning or with a mortality salience manipulation. Participants in both conditions responded in the same way across a number of studies; specifically, participants were more negative towards someone who criticized their country (thereby preserving a desirable set of relations between oneself and one's country), more punitive towards a prostitute (maintaining an orderly set of relations within the external world), and more desirous of high-status products compared with those in a control condition (which allow for positive associations between oneself and the world). "In another direct test of the MMM, we harkened back to Bruner & Postman's (1949) work with perceptual paradigms by secretly switching experimenters without participants consciously noticing; participants in this 'Transmogrifying Experimenter' condition were more punitive towards prostitutes than participants in a control or mortality salience condition. (Proulx & Heine, 2007)" It is not clear what model, other than the MMM, could account for these findings.

Other research programs have yielded findings easily integrated into the MMM, but counter to the predictions of TMT. For example, McGregor et al. (2001) found that having people experience a temporal discontinuity manipulation led them to have the same response as a mortality salience manipulation; specifically, they showed a heightened intergroup bias (which provides people with an orderly and desirable set of associations between themselves and their group). There was no difference in participants' responses between this condition and another condition in which mortality salience was manipulated. Navarrete, Kurzban, Fessler, and Kirkpatrick (2004) provided people with a manipulation of theft salience (they were to imagine their homes had been burglarized), or a manipulation of social isolation (they were to imagine themselves isolated from family and friends), or a mortality salience manipulation. Subsequently, participants evaluated an anti-American essay. Participants in all three conditions responded with more hostility towards the anti-American essay writer, compared to those in a control group. Van den Bos and colleagues (Van den Bos & Miedema, 2000, 2003; Van den Bos, et al., 2005) asked people to consider how they feel when they are uncertain or when their mortality is made salient. People in both conditions responded with increased anger towards unfair treatment compared with those in a control condition (perceived unfairness violates one's expected relationships with the world). Miedema, Van den Bos, and Vermunt (2004) found that participants reacted more strongly towards variations in fairness when their self-image had been threatened (by having them recall situations in which central aspects of their selves were questioned by people who were very important for them) relative to a control condition, in ways identical to those previously identified by mortality salience manipulations (e.g., Van den Bos

& Miedema, 2000). Burris and Rempel (2004) found that reminding people of the existence of dust mites led to a preference for stereotypical targets over counter-stereotypical targets, compared with those in a control condition. They also found this identical pattern of results when contrasting mortality salience and control conditions (cf., Schimel, Simon, & Greenberg, 1999). Although thoughts of dust mites are not associated with thoughts of mortality, they do threaten one's meaning frameworks in that they produce an invasive, unexpected, and undesired association with the self.

In sum, research has shown that a diverse array of threats to established relations (i.e., temporal discontinuity, secretly switching experimenters, reminders of the relative meaninglessness of one's life, thoughts of burglary, thoughts of social isolation, feelings of uncertainty, self-image threats, and thoughts of dust mites) lead to the same responses as manipulations of mortality salience to a diverse array of dependent measures (i.e., intergroup biases, preferences for high status products, punitive responses towards a prostitute, dislike of someone who criticizes one's country, anger towards unfair treatment, and preference for stereotypical targets). In all of these studies, the effects from the nondeath meaning threats were as strong as the effects of mortality salience manipulations, although we note that some efforts to manipulate meaning have not replicated TMT findings (e.g., Baldwin & Wesley, 1996; Landau et al., 2004). Taken together, the diversity of operationalizations and predicted responses in the studies reviewed lends support to the robustness of the meaning-making compensatory process, and weakens alternative accounts of any individual study. Apparently, meaning threats elicited through numerous means influence people in the same ways as mortality salience.

These findings are a challenge to the logic of TMT. One possibility is that researchers have merely identified a series of independent mechanisms that happen to yield similar outcomes to mortality salience manipulations. This is not an unreasonable conjecture, for if social psychological research has revealed anything, it has shown that there are multiple independent causes for virtually every social behavior. Perhaps, then, the similar effects from these various experimental manipulations are multiple and independent causes of worldview defense. How can one determine whether one has identified a series of independent mechanisms or that a single general mechanism underlies the specific mechanisms that are actually measured? We submit that there are a number of aspects of the previously reviewed evidence that lean heavily in favor of a single mechanism account. First, studies that manipulate both mortality salience and other threats to meaning have yielded effects for the same specific dependent measure, within the same study, that are comparable in magnitude (e.g., Burris & Rempel, 2004; Heine et al.,

2007; McGregor et al., 2001; Navarette et al., 2004; Van den Bos et al., 2005). This would be unusually co-incidental if the mechanisms were independent. Further, that similar effects emerge for the wide variety of different dependent variables that were used in those studies further weakens the case for multiple mechanisms. Last, research that shows that boosts in one domain of meaning weakens the effects of threats to meaning in other domains (e.g., Harmon-Jones et al., 1997; Mikulincer & Florian, 2002; Steele et al., 1993; Tesser et al., 2000) provides clear causal evidence that the effects are substitutable, and thus reflect a single underlying mechanism. In sum, we do not find it compelling to conclude that other research programs have identified mechanisms that are separate from the processes involved in TMT.

A second possibility consistent with TMT is that the threats to meaning described lead to TMT-like responses because meaning threats weaken the anxiety buffer that serves as a levee to keep death thoughts from flowing into consciousness. Once this anxiety buffer has been breached, the participant's consciousness would be awash in death thoughts, and these would then lead to the chain of events to aspire for symbolic immortality. However, we challenge this alternative account in two respects. First, there is little evidence that death thoughts are activated by these other meaning threats. Word completion tasks reveal that none of these manipulations led to increased death thought accessibility (Burris & Rempel, 2004; McGregor, Zanna, & Holmes, 1998; Navarrete et al., 2004; Van den Bos & Miedema, 2003), however, we note some other manipulations, such as relationship problems (Florian, Mikulincer, & Hirschberger, 2002), and thoughts of physical sex among neurotics (Goldenberg, Pyszczynski McCoy, & Greenberg, 1999), have been shown to heighten death thought accessibility, findings that are not easily explained by the MMM. It is difficult to maintain that the meaning reconstruction efforts are due to the activation of death thoughts when these studies have failed to find it. Second, the MMM is a far more parsimonious account of findings from studies in which mortality salience is not manipulated. The MMM explains the findings from non-death-related studies, as well as TMT findings, by maintaining that any number of significant threats to one's meaning framework will lead to a response to affirm an alternative framework.

Conclusion

In *Being and Time* (1953/1996), Heidegger famously worked through what some might consider a silly question: Why do people experience angst when they think about dying? For Heidegger, "angst about death must not be confused with fear of one's demise"

(p. 232), for it is what death represents that accounts for angst, this being the catastrophic, unavoidable breakdown of all relations, both within the self and between the self and the outside world. "Angst in the face of death is Angst in the face of the ownmost nonrelational potentiality-of-being not to be bypassed" (Heidegger, 1953/1996, p. 232). Meaninglessness is the problem, and in *An Absurd Reasoning*, Camus (1955) came to the same conclusion by turning Heidegger's question on its head: What state of being is so unbearable, it makes one want to die? Camus wrote that "the feeling of the absurd…this divorce between man and his life, and actor and his setting…there is a direct connection between this feeling and the longing for death". To exist in a state of alienation, disassociated from the world and deprived of symbolic unity, is to endure an existence that becomes gradually unendurable. If the presence of meaninglessness provokes some to seek death out, it follows that the quest for meaning cannot simply be about efforts to avoid thinking about death.

The alternative hypothesis, that the quest for meaning lies at the heart of TMT and many other psychological processes, is one that is already supported in the literature, insofar as each central assertion of the MMM has been previously established. As we have shown, it has been well established that humans generate systems of expected relationships from birth, and that these systems, often called schemas, lie at the heart of memory, perception, and cognition. It has been well established that humans seek to maintain coherent and consistent mental representations of expected relations, and that revision, reinterpretation, and reaffirmation are all processes that are engaged in when expected associations are threatened, across a wide variety of psychological phenomena. Finally, there is growing evidence that meaning maintenance is a general motivational mechanism, where the specific systems of expected associations involved in fluid compensation are themselves substitutable. It is the aim of the MMM to pull these heretofore disassociated findings into a coherent, consistent unified whole, a system of theoretical expected associations that provides the basis for further studies demonstrating the substitutability of meaning.

Notes

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