The Frog in Kierkegaard's Beer: Finding Meaning in the Threat-Compensation Literature

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Abstract

Much existential philosophical theorizing and experimental psychological research is consistent with the notion that people experience arousal when committed beliefs are violated, and this prompts them to affirm other committed beliefs. People depend on meaning frameworks to make sense of their experiences, and when these expected associations are violated, the offending anomaly is often either assimilated into the existing meaning framework, or their meaning framework is altered to accommodate the violation. The meaning maintenance model proposes that because assimilation is often incomplete and accommodation demands cognitive resources, people may instead respond to anomalies by affirming alternative meaning frameworks or by abstracting novel meaning frameworks. Empirical evidence and theoretical implications are discussed.

The basic thesis of this manuscript is that a good deal of what we call the 'threat–compensation' literature in social psychology can be summarized in one sentence: when committed beliefs are violated, people experience an arousal state that prompts them to affirm other beliefs to which they are committed. This sentence also happens to summarize the meaning maintenance model (MMM; Heine, Proulx, & Vohs, 2006; Proulx & Heine, 2006), which attempts to integrate a variety of social psychological perspectives in providing support for this claim. This is not to suggest that the MMM is the first psychological perspective to make this broad claim. In fact, the above sentence could just as easily summarize the bulk of existentialist theorizing over the past century and a half. Looking all the way back to Kierkegaard, a similar claim was fully discussed and developed by the mid 19th century, though the full theoretical implications of this claim have yet to be imported and developed by the current social psychological literature. Over the course of the next few pages, we'll attempt to do just that – summarize this existential perspective, point to findings that support this perspective in the social psychological literature and argue that the implications of this perspective will move the social cognition literature in directions yet to be explored.

An Acknowledgment of the Absurd

In 19th century Copenhagen, a failed academic named Soren Kierkegaard broke off with his fiancée so he could focus on his writing. Over the next 7 years, an increasingly isolated Kierkegaard expressed his growing misery to a rapidly diminishing audience. Then he collapsed in the street and died. A few decades later, the writings of this melancholy dane ended up initiating a dominant philosophical guide for living of the 20th century: Existentialism. It's not clear – and not likely – that Kierkegaard actually surmounted what

he identified as the central barrier to human happiness, either in his life or in his writings. Rather, his contribution lies in his clear-eyed identification of this barrier: our experience of reality does not make sense, we all realize this, and it's making us miserable.

According to Kierkegaard, the great philosophical systems of Hegel and Kant were riddled with contradictions. The emerging fields of scientific inquiry were uncovering contradictory phenomena faster than they could be explained. Turning to the Good Book was no help either; God's demand that Abraham murder Isaac, the last hope of the Israelites, made about as much sense as God singling out Job, the world's most god-fearing man, for the most degradation heaped upon any man. Of course, if our own lives made sense in any satisfying way, we would never have invented these systems to begin with. All too often, the plans we make to attain our goals fail to account for reality, where these goals continually contradict one another and are ultimately rendered irrelevant by our unavoidable demise. Absurdity, it appears, is everywhere.

For Kierkegaard, and the existential theorists that followed, the 'feeling of the absurd' (Camus, 1955) could be evoked by *any* perceived inconsistency, though the feeling itself was remarkably consistent in how it was experienced, whether it followed from finishing a beer and finding a live frog at the bottom of the mug (Kierkegaard, 1846/1997) or contemplating one's own death (Heidegger, 1996/1956). Existential anxiety, writ large, was understood as the common psychological response to the breakdown of expected relations – *meaning* – that constitute our understanding of our selves, the world around us, and our relation to this world. Even as these expectations are violated by contradictory experiences, our unique capacity for reflection allows us to compare expectations and note their frequently contradictory nature. Existential anxiety, it appears, can be experienced in any given situation – and often is.

If this was the extent of Existentialist psychological insight, it's unlikely their ideas would have proliferated – not because they were wrong, but because they were too depressing. Existentialists were not *nihilists*, however, as the central aim of most existentialist theorists was to find a solution to the crisis they had highlighted. Even if things don't make sense, we can and do compensate for the awareness of 'nonrelations' (Heidegger, 1953/1996, p. 232) in a variety of ways. The most common of these compensatory responses to nonrelation is to simply 'return to the chain' (Camus, 1955, p. 10) and affirm existing relations elsewhere in our environment. We re-integrate with 'the they' (Heidegger, 1953/1996, p. 235), which means throwing ourselves into our work, our relationships, our general interests – anything else that we find *meaningful*. Importantly, the meaning frameworks we affirm following the 'feeling of the absurd' can be entirely unrelated to the absurdity that provoked it. In fact, this is *commonly* the case, particularly when the absurdity in question is difficult (impossible?) to render sensible.

Psychology and the Absurd

Although the existentialist theorists may have proposed their ideas without much thought to experimental psychology, there are central psychological assumptions made by the existentialists that psychologists can address: (a) people are motivated to construct expected relations that cohere with one another and their experiences; (b) a distinct mode of arousal is associated with an awareness that this is not always the case; (c) motivated by this arousal, we often engage in efforts to affirm other meaning frameworks; (d) doing so makes us feel better, at least in the short term.

In fact, psychologists have spent the better part of the last century telling this very story, albeit from the perspective of many different authors offering disjointed and some-

times overlapping accounts. According to Bartlett (1932), all propositions are organized as psychological schemata. According to Bruner and Postman (1949), the violation of a schema (now called a 'paradigm') initiates cognitive processes that preserve the schema, as well as some kind of 'emotional distress.' According to Piaget (1937/1954), the emotional distress (now called 'disequilibrium') that follows the violation of a schema motivates the construction of new schemata through assimilation and accommodation. According to Festinger (1957), arousal following from a schema violation (now called 'dissonance') also prompts efforts to repair the damaged schema. According to numerous social psychological researchers over the past 20 years, violations of beliefs about literal immortality lead people to affirm worldviews in an effort to attain symbolic immortality (Greenberg et al., 1992), violations of social affiliations provoke efforts to affirm social affiliations (Baumeister & Leary, 1995), violations in the perceived integrity of a social system lead people to make efforts to justify that same system (e.g., Jost & Banaji, 1994; Lerner, 1980), violations of subjective certainty lead people to affirm other sources of subjective certainty (Hogg & Mullin, 1999; McGregor, Zanna, Holmes, & Spencer, 2001; Van den Bos, 2001), violations of security lead people to strive to regain a sense of security through other avenues (Hart, Shaver, & Goldenberg, 2005), violations of beliefs about control provoke efforts to affirm other beliefs about control (Kay, Gaucher, Napier, Callan, & Laurin, 2008; Whitson & Galinsky, 2008), violations of the self-schema are ameliorated by unrelated affirmations of the self (Fein & Spencer, 1997; Sherman & Cohen, 2006; Steele, 1988) and violations of beliefs about value and purpose provoke efforts to affirm beliefs about value and purpose (Park & Folkman, 1997). Underlying all of these 'threat-compensation' processes may be a need for coherence (Antonovsky, 1979), a unity principle (Epstein, 1981), a need for cognitive closure (Kruglanski & Webster, 1996) or a need for structure (Neuberg & Newsom, 1993).

Meaning Maintenance Model – Gathering Up the Threads

There are two general perspectives one could take when surveying the vast and multiplying literatures in social psychology presenting threat-compensation processes. The first would be to imagine that each of these literatures exemplifies an entirely distinct psychological process. As noted, people may affirm committed beliefs following death reminders for reasons that are uniquely related to mortality (Greenberg et al., 1992), while others affirm committed beliefs following self-related threats for reasons that are unique to the self (Sherman & Cohen, 2006). Entirely separate, analogous processes could underlie compensatory affirmation following control threats (Kay et al., 2008) or self-certainty threats (Hogg & Mullin, 1999; McGregor et al., 2001; Van den Bos, 2001). The second perspective would suggest that the various threat-compensation effects that follow from these literatures are not entirely distinct, but rather represent partial manifestations of the same psychological motivation. We strongly advocate for this second perspective and submit that this underlying motivation is a desire to maintain mental representations of expected associations, that is, meaning.

The MMM is an integrative framework that argues that the analogous threat-compensation processes catalogued in the social psychological literature are, at least partially, manifestations of an underlying effort to affirm committed beliefs following the violations of other – often unrelated – committed beliefs. While specific elements of this process may vary depending on the content of the threatened beliefs and the content of the beliefs that one subsequently affirms, we argue that the cognitive and motivational machinery that underlies this process is largely invariant across domains. Approaching the

threat–compensation phenomena from this perspective, we argue, allows for unique theoretical hypotheses that are not currently explored by other perspectives. In what follows, we will elaborate on this framework, present evidence that supports this generally integrative perspective and suggest directions for social psychologists to take when subsequently exploring this phenomenon.

What is Meaning?

Across the various analogous processes that constitute the threat-compensation literature, we suggest that in each instance, *meaning* is threatened, and *meaning* is affirmed. However, this expression – meaning – has been used by so many theorists in so many disciplines to describe so many seemingly different notions that it begins to sound, well, meaningless. What, then, is this meaning stuff that is being challenged, threatened, violated, regained or affirmed? In general, we define meaning as *relationships*. Specifically, we understand meaning to be mental representations of relationships between committed propositions. For example, 'snow' means something that is cold, falls from the clouds in the winter months, leads to bad driving conditions, affords skiing opportunities and the construction of snowmen. Snow would come to mean something entirely different if it we encountered it warm, or it came out of the bathtub pipes, arrived in the summer or was associated with badminton. This understanding of meaning finds its origin in the existentialist literature. Camus understood the 'fundamental impulse of the human drama' as a need for consistent 'systems of relations' (p. 10). Heidegger understood all existential threats as instances of 'nonrelation' (Heidegger, 1953/1996, p. 232), where the greatest anxiety arose from threats to related propositions to which we were most committed. According to Kierkegaard, the network of propositions to which we were most committed constituted our sense of selfhood, which he described as a 'relation, which relates itself to its own self, and in relating itself to itself, relates itself to another' (Kierkegaard, 1848/1997 p. 351).

Not to be outdone by the philosophers, psychologists have also operationalized a variety of terms to represent these same relations. They have elaborated on such concepts as paradigms (Bruner & Postman, 1949), scripts (Nelson, 1981), narratives (McAdams, 1997), worldviews (Thompson & Janigan, 1988), systems (Jost & Banaji, 1994), assumptive worlds (Janoff-Bulman, 1992) – and sometimes, meaning (Baumeister, 1991). Each of these examples represent relations that join different kinds of propositions, whether they involve value and purpose narratives (Park & Folkman, 1997), object categories (Waxman, 1998), analytic and holistic associations (Nisbett, Peng, Choi, & Norenzayan, 2001), justice narratives (Lerner, 1980), self-schema (Markus, 1977) or perceptual schema (Intraub, Gottesman, & Bills, 1998). Regardless of the nature of the propositions being joined together, we argue that the meaning of meaning remains the same: the expected relationships between these propositions.

Some meaning frameworks relate one event to another. Others relate features of objects, while others join abstract concepts to form complicated theories. Some are explicitly maintained such that we can consciously reflect and report their content. Others are entirely implicit and guide our behaviors in a manner that lies outside our conscious awareness. Many meaning frameworks are formed on the basis of observation and induction, while others are organized as abstracted principles clustered together in ways that seem to make sense. And what is perhaps most similar to how many people intuitively consider meaning in their lives, some meaning frameworks are teleological, and link our actions with a sense of purpose or higher calling. Regardless of what propositions are structured by meaning frameworks, how they were formed (direct experience or

conscious reflection), or how they are represented (implicitly or explicitly), these structures bottleneck at the same cognitive juncture: expectation (Bruner & Postman, 1949; Kuhn, 1962/1996; Peterson, 1999).

What is a Meaning Threat?

We expect events to happen for a reason. We expect to have control over our actions, bachelors to be unmarried men, bad things to happen to bad people, and objects to be permanent. Early in our lives we expect to live forever, and later on we don't (Maxfield et al., 2007; Taubman-Ben-Ari & Findler, 2005). We project expectations onto novel environments even if that expectation is that we don't know what to expect (Proulx, Heine, & Vohs, 2010). Meaning threats are experiences that violate or contradict these expectations, whether they involve unusual events (Proulx & Heine, 2009), inconsistencies between attitudes and behaviors (Festinger, 1957), a lack of control (Whitson & Galinsky, 2008), perceived injustice (Lerner, 1980), threats to our sense of security (Hart et al., 2005), or a reminder of our own mortality (Greenberg et al., 1992). Sometimes we have positive experiences that nevertheless violate our expectations (Plaks & Stecher, 2007); these should also constitute meaning threats, whereas negative experiences that confirm our expectations should not constitute a meaning threat (Major, Kaiser, O'Brien, & McCoy, 2007). Indeed, much work on self-verification theory reveals that people find positive information about the self to be distressing when it is in conflict with their own, more negative, self-views (for a review see Kwang & Swann, forthcoming).

How Do People Maintain Meaning in the Face of Anomalies? The Stories of Assimilation and Accommodation

Regardless of what meaning framework provided the basis for the violated expectation – be it a perceptual schema or a 'Just World Hypothesis,' a remarkably convergent picture has emerged of the behaviors we engage in when meaning frameworks are threatened. The modes of meaning maintenance most commonly encountered can be termed *assimilation* and *accommodation* (to use Piaget's terminology), although these processes have been applied to violations of scientific theories (Kuhn, 1962/1996), violations of value-laden worldviews (Park & Folkman, 1997; Thompson & Janigan, 1988) or implicit perceptual paradigms (Bruner & Postman, 1949) under different labels. When expectations predicated on a meaning framework are threatened, it is often the case that we either assimilate the experience such that it no longer violates these expectations, or we acknowledge the anomaly and accommodate our meaning framework to account for the violation.

Examples of assimilation are common across the psychological literature. If you're presented with an anomalous playing card that is a black four of hearts, you may *see* it as a four of spades (Bruner & Postman, 1949). If you see a mouth making a vowel sound that doesn't match the moving lips, you may *hear* it as though it matches what you see (McGurk & MacDonald, 1976). If you hear about someone who has experienced a tragedy, you might imagine the person deserved it somehow, thereby preserving your belief in a just world (Lerner, 1980).

Examples of accommodation are equally easy to come by, as they can generally follow from the same kinds of meaning threats that can evoke assimilation. If you're presented with an anomalous playing card, perhaps you consciously note the anomaly and revise your expected associations for playing cards by acknowledging that it comes from an altered deck of cards, thereby noting all of the other anomalies much more quickly

(Bruner & Postman, 1949). Or maybe you're a student who's just argued in favor of a tuition increase. This behavior doesn't seem to cohere with your actual beliefs, unless, perhaps, you favor a tuition increase more than you might have originally thought (Festinger, 1957). Or perhaps you're a 5-year-old who has noticed for the first time that your judgments about the volume of liquid have been largely incorrect − one has to take the height *and* width of a container into account (Piaget, 1960).

Assimilation is a common response to meaning threats because it's fast and requires little in the way of cognitive resources, however, the assimilation often is not complete and thus doesn't fully reduce the unpleasant arousal that follows from a meaning threat (Bruner & Postman, 1949; Piaget, 1960). Conversely, accommodation is a more satisfying response to meaning threats in that it fully integrates the anomalous event into a meaning framework − it involves the creation of new meaning. However, the cost of accommodation is that the efforts to consciously reorganize meaning frameworks may involve significant cognitive resources and may take considerable time. As an extreme example, the accommodation of anomalous observations into new scientific theories may take decades (Kuhn, 1962/1996).

Because accommodation is such a resource-heavy process, in the face of an anomaly people often do not have the wherewithal to begin to make any sense of what they've encountered. In some situations, people are not consciously aware of the anomaly because it has been presented subliminally (e.g., Arndt, Greenberg, Pyszczynski, & Solomon, 1997; Randles, Proulx, & Heine, 2010) or has been immediately (but not completely) assimilated (e.g., anomalous playing cards; Bruner & Postman, 1949) and are therefore incapable of accommodating their meaning frameworks to render the absurdity sensible. In some other situations, people might be consciously aware of the anomaly but do not have the available cognitive resources needed to heal the anomaly in a satisfying way through accommodation. This may be because you're a 5-year-old child who lacks the short-term memory capacity to solve the conservation task (Piaget, 1960) or you're a 35-year-old Kierkegaard who can't figure out why a loving God would create a world filled with senseless suffering (Kierkegaard, 1843/1997). Alternatively, one might not be able to make sense of an anomaly because they haven't had the chance to think about it sufficiently. It's a common finding in the threat–compensation literature that affirmation effects are heightened if participants are given a distractor task following the meaning threat (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994), which may serve to place them under cognitive load, or if the anomaly is presented subliminally (Arndt et al., 1997), and thus cannot be accommodated. There might also be situations in which the anomaly is associated with an experience that is so traumatizing that consciously reflecting on the event is too anxiety-provoking to easily endure (e.g., PTSD), and thus never gets fully accommodated. In sum, there are various situations in which people are unable to create any kind of lasting meaning from an anomaly.

When it is not Possible to Create Real Meaning, How do People Respond to Meaning Threats? The Story of Affirmation

In the situations summarized above, people come to rely on another strategy for dispelling the arousal accompanying the meaning threats; the strategy that constitutes the ubiquitous threat–compensation effects reported in various experimental existential psychological theories discussed earlier. That is, in response to a meaning threat, people often engage in compensatory *affirmation*, which involves increasing one's commitment to an alternative meaning framework. To the extent that the meaning disruption cannot be

resolved in an entirely satisfying way, people will recruit unrelated patterns of relations in an effort to immediately – if temporarily – dispel the feeling of the absurd that arose from their inability to establish a chain of relations to connect the original meaning threat with existing meaning frameworks.

For example, imagine a man traveling for the first time to Paris, enjoying a Café au Lait in a beautiful and ornately decorated café. While gazing across the room, he observes a waiter respond somewhat rudely to a customer sitting nearby. Although the man knows that this is his first visit to this café and that he has never seen the waiter or customer previously, he suddenly experiences the profound sense that he has witnessed this exact exchange before. The hum of the café fan, the disdainful look on the waiter's face, the pungent aroma of the coffee, the picture on the wall, the string of words that hang in the air, all leave the disturbing impression that this man is experiencing the identical moment for the second time. This discomforting déjà vu experience may prove difficult to resolve as the man is unable to understand how this poignant sense of familiarity could have possibly emerged in this unfamiliar setting. Without being able to make sense of it, he might respond to this meaning breakdown by secretly wishing that the café owner would come storming out of the back to fire the waiter for his rude comments. Wishing that the waiter would get his comeuppance has no direct relevance to the man's confusion; however, affirming his commitment to the belief that the world is a just place and bad behavior doesn't go unpunished allows the man to reduce his 'feeling of the absurd' by dwelling on a coherent meaning framework rather than reflecting on his disjointed experiences.

In response to meaning threats, people may seek meaning in domains that are easily recruited, rather than solely in the domain under threat. The man in the above scenario does not need to make sense of where this unexplained sense of meaninglessness is coming from; he may be completely unable to do so. When people are not able to find ways to integrate an anomalous experience into their meaning frameworks, they may affirm an *unrelated* meaning framework so that they can regain a general sense of meaning. Unrelated meaning frameworks may be particularly desirable targets for affirmation precisely because they remain unconnected to, and thus undamaged by, the offending incongruity. Such compensatory affirmations do little toward providing any kind of long-term resolution of these kinds of meaning threats. Nevertheless, this kind of 'covering over nonrelation' (Heidegger, 1953/1996, p. 232) may temporarily dispel the arousal that arose as the result of the original anomaly.

There are several examples of compensatory affirmation from the social psychological literature where people affirm an alternative schema in the face of an anomaly that are consistent with the MMM. For example, Burris and Rempel (2004) found that when people encountered an anomaly (i.e., they were told about dust mites that were burrowing into their skin – unexpected and undesirable associations), they affirmed moral beliefs (i.e., they became more critical of outgroups). Navarette and colleagues (Navarrete, Kurzban, Fessler, & Kirkpatrick, 2004) found that when people had meaning frameworks threatened (i.e., they imagined being burglarized, and thus had their expectations of security violated) they affirmed alternative meaning frameworks (i.e., they became more critical of someone who criticized their country). Steele and Liu (1983) found that although people typically feel discomfort in making close-call decisions (which involve confronting many inconsistencies), these feelings, and the accompanying rationalizations, can be assuaged by allowing the participants to affirm themselves, such as having science students wear a coveted lab coat. Hogg and Mullin (1999) found that participants who experienced subjective uncertainty later affirmed a social schema (i.e., they engaged in more intergroup discrimination). Greenberg, Porteus, Simon, Pyszczynski, and Solomon

(1995) found that when people considered a meaning threat (i.e., they were reminded that they would someday die), they became more defensive toward their culture (i.e., they avoided defacing cultural icons). These studies, all conducted with other paradigms in the threat–compensation literature, are consistent with the notion that when people encounter thoughts and perceptions that are incongruous with activated meaning frameworks, they affirm unrelated meaning frameworks in response.

There are also several unique findings that have emerged from the MMM that would seem to be difficult to explain with various other threat-compensation theories. For example, Proulx and Heine (2008) observed that when people encountered a perceptual anomaly (i.e., the experimenters were surreptitiously switched on them without them consciously noticing) they became more protective of the status quo (i.e., they were more punitive toward someone arrested for prostitution). Likewise, Proulx and Major (2010) observed that participants who played Blackjack with a deck of cards where the colors for some of the cards were mismatched to the suits (as in Bruner & Postman, 1949) yielded the same effect with the prostitution scenario. This same tendency to punish a prostitute also emerged when participants were subliminally exposed to word pairs that were incoherent (e.g., quickly–blueberry) but not when they were coherent (e.g., juicy–blueberry; Randles et al., 2010). Further, reading an absurd story that contained many nonsequiturs yielded this identical effect, except when participants were forewarned that the story would contain unexpected elements (Proulx et al., 2010). Quite remarkably, the extent to which participants were punitive was highly similar in magnitude, regardless of the particular meaning threat that they encountered. These effects are not specific to the punishment of law-breakers. Other studies have found that participants who encountered meaning threats embedded in surrealist art and literature responded by making increased belongingness affirmations and exhibiting a heightened desire for structure (Proulx et al., 2010). Heine, Proulx, MacKay, and Charles (2010) found that those who were led to believe that their life was meaningless became more critical of an out-group member and came to desire high status products more. Van Tongeren and Green (forthcoming) demonstrated that the subliminal exposure of meaninglessness-related words led people to bolster their self-esteem, belongingness, need for closure, and symbolic immortality. Hence, there is considerable support across a diverse set of manipulations designed to engender a meaning threat, that people respond to such threats with a variety of meaning-affirmational responses.

Of course, some of the above experiments have been interpreted according to theoretical frameworks other than the MMM. Various other theories about death (e.g., Greenberg et al., 1995), amorphous boundaries of self (e.g., Burris & Rempel, 2004), security (e.g., Hart et al., 2005; Navarrete et al., 2004), self-consistency (e.g., Steele, 1988), and uncertainty (e.g., Hogg & Mullin, 1999; McGregor et al., 2001; Van den Bos, 2001) aim to account for threat-compensation processes as well. The MMM integrates these other threat-compensation frameworks through its domain-general nature. For instance, the threat targeted in terror management theory is that self-aware humans need to seek symbolic immortality to assuage the 'potential terror' inspired by their ability to foresee their ultimate demise (e.g., Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989; but for other interpretations see Kirkpatrick & Navarrete, 2006; Renkema & Stapel, 2008). In contrast, the MMM views thoughts of one's looming mortality as being incommensurable with the typical undergraduate subject's daily plans and aspirations – their to-do list doesn't contain the consciously reflected upon entry 'avoid dying' (Heidegger, 1953/1996; Proulx & Heine, 2006) and is thus one particular instance of a kind of meaning threat that is no different in its affirmational consequences as that of the déjà vu experience described above. Likewise,

self-affirmation theories describe how people respond to threats to their self by affirming key values that the individual upholds (e.g., Steele, 1988). The MMM views self-affirmations as one particular class of affirmations, in that they represent one well-developed meaning framework that the individual is committed to and strives to protect. Encounters with anomalies unrelated to the self, such as implicitly detecting a changed experimenter (Proulx & Heine, 2008), should lead to similar tendencies to affirm other meaning frameworks. The tripartite security system proposes that a desire for security underlie motivations to defend worldviews, self-esteem, and attachments (Hart et al., 2005). The MMM views security as one kind of coherent meaning framework that is violated when anomalous events cannot be integrated which lead to feelings of insecurity. Studies following from uncertainty theories often have participants recall a time when they felt uncertain about themselves (Hogg & Mullin, 1999, Van den Bos, 2001) or their goals (McGregor, 2007) and demonstrate compensatory affirmation of alternative meaning frameworks. While uncertainty no doubt plays a role in all meaning maintenance efforts, 'uncertainty' on its own does not address why we engage in one meaning maintenance effort rather than another (i.e., assimilation, accommodation, or affirmation). In sum, each of the various threat–compensation accounts underlies research that demonstrates that people repair a meaning threat (e.g., desire for immortality, self–threat) with subsequent affirmations. Each of these accounts is consistent with and overlaps to a certain degree with the MMM, yet the MMM is able to account for all of the findings from these other accounts and can also make unique predictions (e.g., perceptual anomalies should lead to moral affirmations, Proulx & Heine, 2008; surreal art experiences should lead to a heightened desire for structure, Proulx et al., 2010), that do not appear to be easily amenable to these other theoretical accounts. Hence, we submit that the MMM is the most integrative perspective that can account for the broadest set of predictions.

When Alternative Meaning Frameworks are not Readily Accessible, How do People Respond to Meaning Threats? The Story of Abstraction

All of the reviewed threat-compensation studies shared a common methodological characteristic – following an anomalous experience, participants were provided with an alternative meaning framework that they could affirm. For example, upon witnessing a perceptual anomaly, participants were provided with an opportunity to make a moral affirmation by being asked to set a punishment for a woman arrested for prostitution (Proulx & Heine, 2008). A question arises regarding what people would do if an alternative meaning framework was *not* made readily available to them. In the absence of an available meaning framework, when encountering an anomaly, would people come to create a novel framework instead? Is the need to feel that one's understanding of the world is suspended in a coherent web of relations urgent enough that people will begin to construct novel meaning frameworks in response to a meaning threat?

Some evidence in support of this hypothesis comes from a few recent studies. Whitson and Galinsky (2008) found that following threats to people's perceived control over their lives, participants reported seeing illusory patterns in a variety of environments, from illusory correlations in a data array to heightened beliefs in conspiracy theories. Even more provocatively, Proulx and Heine (2009) found that people who encountered unrelated meaning threats (either by reading an absurd Kafka short story or by considering the disunity of their self–concept) were better able to determine the presence of relations that are objectively present in their environment; that is, they could *learn* new patterns better. Likewise, Randles et al. (2010) found that these implicit pattern-learning skills could be induced by subliminally presenting participants with incongruous word pairs; this study

revealed that both the threat and the compensation can occur beneath conscious aware-ness. These findings suggest that when people do not have a readily available meaning framework that they can affirm, in the presence of an anomaly, people may become better at abstracting new expected relations. Both affirmation and abstraction are responses to meaning threats that allow people to recruit patterns of associations that are unrelated to the original threat, and subsequently ground the individual again in a network of coherent associations. As in the case of the affirmation studies reviewed above, we suggest that the MMM is uniquely able to integrate these diverse findings.

Who Maintains Meaning in the Face of Anomalies?

We should note that throughout this paper, we have been using the term 'people' in an incautious manner, given that all of the reviewed studies were conducted solely with Western (usually American) college students, and it is not yet clear the extent to which these findings would generalize to other populations (Henrich, Heine, & Norenzayan, forthcoming). It is the case that people in other cultures do show evidence for threat-compensation effects in the mortality salience paradigm, for example, which has been conducted in more than a dozen cultures with various subpopulations (Burke, Martens, & Faucher, forthcoming). Curiously, however, Americans show more pronounced affir-mation responses to mortality salience than do other Westerners, while Westerners show stronger effects than do non-Westerners. Furthermore, college students show stronger affirmation responses to mortality salience than do other adults (Burke et al., forthcom-ing). To the extent that these population differences in the magnitude of threat–compen-sation responses generalize to other kinds of meaning threats, this may point to the unique existential vulnerability of American students. Perhaps it's the case that those participating in highly individualistic cultural contexts are the most untethered from a protective system of interpersonal relations and expected role obligations, and this renders them especially defensive to anything that might further prompt any existential angst. It may also be the case that if non-Western populations are buffered against certain meaning threats by protective interpersonal relations, these populations may be especially vulnera-ble to meaning threats following from violated social roles and obligations. Future research will address these possibilities.

Furthermore, we have yet to explore the impact of individual differences in responses to meaning threats. Research from terror management theory (Greenberg et al., 1992) and uncertainty theory (e.g., Dijksterhuis, van Knippenberg, Kruglanski, & Schaper, 1996) has found that people high in a need for closure respond more defensively to meaning threats. We anticipate that a heightened need for closure would be associated with enhanced compensatory responses across a broad array of meaning threats. It seems likely that several other individual differences will prove to be relevant in how people respond to meaning threats. For example, do people who seek out the experience of meaningless, at least as it is represented in surreal artistic traditions, have different com-pensatory responses to threats than people who do not seek out such experiences? Hence, a number of important questions remain regarding how much threat-compensatory responses generalize across different kinds of populations.

Why Do People Maintain Meaning?

There are two ways we can approach the question of why it is that people maintain meaning frameworks, just as there are two ways that we can approach the question of

'why' as it applies to any human behavior. There will be a distal account which addresses the ultimate functions that these behaviors evolved to serve, and there will be a proximal account of the specific underlying mechanisms of the behaviors. The various functions that meaning frameworks serve generally follow from the content of these frameworks. For example, causal scripts allow people to predict and control their environment (Lerner, 1980), as well as encode and retrieve memories (Wyer, Bodenhausen, & Srull, 1984). Affiliative schemas facilitate social exchange (Clark & Mills, 1979) and engender a positive feeling of belongingness (Baumeister & Leary, 1995; Hart et al., 2005). Perceptual schemas allow people to make consistent sense of their environment (Intraub et al., 1998). Teleological worldviews help people to deal with tragedy and trauma (Frankl, 1946; Antonovsky, 1979). More generally, meaning frameworks serve to simplify and process the vast amount of information that they encounter. Other species likely also are dependent on meaning frameworks to process the information that they encounter from their environments; however, as humans are the only truly cultural species (Tomasello, 1999), their relational structures are necessarily far more complex than other species (i.e., there are more possible meanings that a given event can have). It is possible that humans are more dependent on maintaining functioning meaning frameworks than are other species, although we note that capuchin monkeys may show evidence for cognitive dissonance (Egan, Bloom, & Santos, 2010), which suggests that they might compensate for meaning threats as well. We suggest that the propensity to maintain these meaning frameworks likely evolved to serve these various functions.

At a proximal level, when a meaning framework is violated, we *feel* something that motivates us to maintain meaning. While this 'mood' (Heidegger, 1996/1956) seldom manifests as a conscious emotional experience, the existential and psychological literatures have generated a variety of terms for this peculiar arousal, whether it's the feeling of the absurd (Camus, 1955), uncanniness (Freud, 1919/1990), dissonance (Festinger, 1957), disequilibrium (Piaget, 1937/1954), imbalance (Heider, 1958), or uncertainty (e.g., Van den Bos, 2001). If this arousal is misattributed to an alternative source, we are no longer motivated to engage in meaning maintenance efforts (Kay, Moscovitch, & Laurin, forthcoming; Proulx & Heine, 2008; Zanna & Cooper, 1974). Perhaps most importantly for the MMM, the meaning maintenance motivation that follows from this unique arousal state has multifinality (Shah, Kruglanski, & Friedman, 2003), insofar as any available meaning framework may be recruited in efforts to reduce this potentially negative arousal state (Heine et al., 2006).

In the past, direct empirical evidence for this proposed arousal state was hard to come by. Explicit measures of arousal – unreliable at the best of times (Baumeister, Vohs, DeWall, & Zhang, 2007) – typically turn up no reports of negative arousal following a variety of threatening experiences, even reminders of one's own mortality (e.g., Greenberg et al., 1995). More recently, however, a variety of advanced physiological and neurocognitive measures have begun to identify reliable syndrome of arousal and activation following experiences that violate expected associations, regardless of their content. For example, Mendes, Blascovich, Hunter, Lickel, and Jost (2007) found that participants experienced a physiological threat response commonly associated with personal discrimination after interacting with a Chinese experimenter who had an Alabama accent. While these two threats are radically divergent in their practical implications, share no content whatsoever – and one is self-relevant (personal discrimination) while the other is not (an unusual accent) – they both involve violations of expected associations, and remarkably, provoke a similar negative arousal state. Likewise, an expanding neuroscience literature has begun to explore neurocognitive responses to all manners of anomaly. For example, there

is reliable activation of the anterior cingulate cortex (ACC) following the implicit aware-ness of task performance errors (Hester, Foxe, Molholm, Shpaner, & Garavan, 2005). If people are given the opportunity to affirm unrelated religious beliefs, this ACC activation following performance errors is decreased (Inzlicht, McGregor, Hirsh, & Nash, 2009). Again, it's remarkable that systems of religious belief should have any bearing on brain activation following unconscious awareness of unrelated task errors – unless a common neurocognitive system is involved in the formation, activation, and response to violations of any expected associations, regardless of their content or magnitude of importance.

It is the central tenet of the MMM that a common syndrome of physiological arousal and neurocognitive activation follows from the violation of any expected associations and that this arousal motivates subsequent meaning maintenance efforts. While meaning threats may vary greatly in terms of their practical, temporal and affective magnitude (e.g., the news that you have terminal cancer versus a black four of hearts), the MMM contends that all violations of expectations share a common syndrome of immediate arousal and activation and that this syndrome is responsible for a good deal of the com-pensation phenomena constitute the threat-affirmation literature. Whether it involves a black four of hearts, a Kafka short story, a threat to one's self-concept or the sudden reminder of one's mortality, we maintain these expectancy-violating experiences bottle-neck at the same 'old brain' system that evolved to detect deviations from expected associations and respond to these deviations in an adaptive manner. In the short term, this often involves retreating and retrenching within a set of familiar (and safe) expected asso-ciations (also see Peterson, 1999); that is, the affirmation of related or unrelated expected associations. This may also involve a heightened motivation and capacity to learn novel, reliable associations following the violation of unrelated associations to which we were committed (i.e., abstraction).

We believe that the postulation of a single syndrome of arousal and activation, one that follows from any meaning threat and that partially motivates all subsequent meaning main-tenance efforts, is a significant contribution to the field, for the following three reasons:

1. It explains why content does not seem relevant in terms of what constitutes a meaning threat.

If the same syndrome of arousal and activation follows from any violation of expected associations, it would explain the overwhelming behavioral commonality between subse-quent compensation efforts. Moreover, it would offer an explanation that does not follow from threat-compensation theories that explain these threats in terms of specific content. For example, a good deal of the threat-compensation literature may be described as ego–defense theories, insofar as they focus on threats to the self-concept (e.g., Swann, Stein-Seroussi, & Giesler, 1992), self-security (Hart et al., 2005), or self-esteem (Tesser, 2000), often arguing that most or all threat-compensation behaviors follow from threats to the self (e.g., subjective uncertainty; Hogg, 2000; and Van den Bos, 2009). If arousal that follows from threats associated with the self also follows from *any* committed belief violation, then we should see analogous compensatory affirmation efforts following from threats unrelated to the self-concept. As we have noted, this appears to be the case, such that implicitly perceived visual anomalies that are unrelated to the self, such as interacting with a changing experimenter (Proulx & Heine, 2008), playing cards with a doctored deck (Proulx & Major, 2010) or seeing subliminally presented syntactic anomalies (Randles et al., 2010) provoke identical compensatory affirmations efforts. Ego-defense theories cannot explain why presenting people with a black four of hearts should provoke the same compensatory affirmation efforts that follow from threats to one's self-concept (e.g., Steele, 1988). Furthermore, ego-defense theories cannot explain why negative arou-sal follows from threats unrelated to the self (e.g., Mendes et al., 2007) or why good

news about the self that nevertheless violates committed beliefs produces negative arousal (e.g., Plaks & Stecher, 2007).

2. It explains why unrelated meaning frameworks may be recruited following a meaning threat.

To the extent that a common arousal/activation syndrome follows from any meaning violation, it would seem unlikely that this arousal would necessitate that the meaning framework that is affirmed would need to share content with the meaning framework that was violated (e.g., when behaviors are dissonant with attitudes, the relevant attitudes are accommodated, Festinger, 1957). We suggest that content-specific theories (e.g., terror management theory) should have an explanation for why the same affirmation of moral values follows from a threat that can be understood as content relevant (e.g., mortality salience) and threats that are unrelated from that content (e.g., seeing a changing experimenter).

3. Hypothesizes a measurable causal agent at the heart of the threat-affirmation literature.

As we have noted, the hunt is already underway for the unique arousal and activation state that may commonly underlie threat-compensation phenomena. Various elements of this syndrome – be it cardiovascular threat responses or ACC activation – may turn out to be necessary or sufficient (or both) in eliciting compensatory responses to a given meaning threat. Determining the nature of this process will be a key advancement of the literature. Further, the MMM would gain additional support if it could be shown that the same arousal and activation states underlie a diverse array of threat-compensatory responses.

Where Do We Go From Here?

We began this manuscript by summarizing the threat-compensation literature in a single sentence: when committed beliefs are violated, people experience an arousal state that prompts them to affirm other beliefs to which they are committed. This summary is a frank acknowledgment of the overwhelming similarity between studies that follow from a variety of threat-compensation theories in social psychology. This summary also provides the justification for identifying the threat-compensation literature as an identifiable literature at the outset. In what followed, we summarized an existentialist literature that explicitly elaborated this perspective back into the 19th century and argued that studies following from various, current social psychological theories offer piecemeal empirical support for this perspective. We also presented evidence following from the MMM that provides direct empirical support for this claim and offers evidence of compensation effects not yet addressed in the social psychological literature. Ultimately, this is our central aim with the MMM – to generate and test hypotheses that do not follow from existing theories in the threat-compensation literature and to generate findings that are not accounted for by these theories.

The domain-general nature of the MMM is arguably both the model's greatest strength and its greatest weakness. It is its greatest strength in offering a unifying theory, by providing a lattice from which the diverse threads of the various threat-compensation paradigms can be woven together. But it is also its greatest weakness in that a model that tries to explain everything may appear to be unfalsifiable and boundaryless. It is a reasonable question, given the domain-general nature of the MMM, to then consider what kinds of events would *not* constitute a meaning threat, and what kind of evidence would be needed to falsify the theory.

Although the findings of our studies thus far indicate that the *content* of a meaning framework does not seem to matter in terms of which meaning frameworks can be affirmed in

the face of a meaning threat (i.e., they do not appear to share any content with the meaning frameworks being threatened), the *structure* of the framework clearly does matter. The MMM maintains that the uncanny sense that arises from the detection of anomalies motivates efforts to perceive that the world as unfolding in ways consistent with their expectations – a coherent structure of related associations must be preserved. What is critical is the *strength of one's commitment* to the expectations. Even though playing cards with black hearts are trivial in terms of their content, people are highly committed to the expectation that hearts are red because they likely have been for every other deck of playing cards that our participants had encountered. Black hearts would cease to be a meaning threat once people's commitment to this association is weakened, as it would be by informing people that some cards are of different colors. Likewise, we found that the inherent meaning threat entailed in reading an absurd story was eliminated when participants were given a head's up that they were going to read something unusual (Proulx et al., 2010). The participants were still uncertain as to what specific content they would encounter, but they did know to anticipate that the content would not map onto their expectations. Hence, the model can be falsified by varying people's commitment to their expectations, and these should be associated with concomitant compensatory responses.

Earlier, we described some efforts to map out the underlying physiology of the arousal elicited by meaning threats (e.g., Inzlicht et al., 2009; Mendes et al., 2007). To the extent that a reliable meaning threat signal is identified, this too could be important for identifying boundary conditions in the model; one could identify which participants showed a specific physiological arousal response to the stimulus and this would serve to predict that the same participants should show a clear compensatory response as well. An objective measure of physiological arousal or neural activation would thus be valuable in helping to identify what kinds of meaning violations would lead to compensatory responses and in determining whether the compensatory responses effectively reduce the negative arousal.

We close by highlighting one positive consequence of the broad domain–general nature of the MMM: the most interesting questions regarding the model have not even been asked yet, let alone answered. As a field, social psychology is used to dealing with smaller and more constrained theories, which are limited to involving certain kinds of content in certain kinds of situations. Perhaps the expansion of social neuroscience will continue to reveal that the same brain mechanisms are involved in multiple processes (e.g., Eisenberger, Lieberman, & Williams, 2003), and accordingly, the field will begin to expect that processes are more integrated than has traditionally been considered. Whatever common thread is ultimately identified as that which best ties together the threat–compensation literature (our bet is on meaning) will lead researchers to strive to understand the nature and consequences of integrated and domain–general psychological processes. This quest will largely occur in unfamiliar territory and with any luck will lead to some exciting discoveries that connect previously distinct landscapes.

Short Biographies

Travis Proulx is an Assistant Professor at Simon Fraser University. His research interests span Social and Developmental psychology, with a special emphasis on how meaning frameworks are formed and maintained over the course of one's life.

Steven J. Heine is Professor of Psychology and Distinguished University Scholar at the University of British Columbia. His research is largely directed at three topics: cultural psychology, meaning maintenance and genetic essentialism. Dr. Heine has received the Early Career Award from the International Society of Self and Identity and the

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Endnote

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