Offensive Defensiveness: Toward an Integrative Neuroscience of Compensatory Zeal After Mortality Salience, Personal Uncertainty, and Other Poignant Self-Threats

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"The best defense is a good offense"

When teams are losing, wise coaches do not harp on what went wrong. Instead, they rally pride and buoy confidence for seizing success. Invoking the ideal of glorious victory encourages aggressive offense, and also indirectly sharpens defense by preventing preoccupation with mistakes. I submit that a similar dynamic can help explain why mortality salience and other threats cause defensively zealous reactions (e.g., Greenberg, Solomon, & Pyszczynski, 1997; McGregor & Marigold, 2003; McGregor, Nail, Marigold, & Kang, 2005; McGregor, Zanna, Holmes, & Spencer, 2001; Solomon, Greenberg & Pyszczynski, 2004). Mounting evidence now indicates that people use zealous ideals to capture their imaginations and re-engage feelings of hope and strength in the face of anxiety provoking threats. The zeal may take the form of value convictions, communal commitment, closed-minded certainty, angry jingoism, religious fervor, or political extremism. The key is that the zealous ideal serves as a beacon to attract motivational focus away from the murky threat. A neuropsychologically grounded account is presented for how defensive zeal can so effectively relieve anxious concern with mortality salience and other threats.

Motivation and Self-Regulation

The starting point of this account is that human brains are wired with modules for focused goal pursuit and for goal disengagement. When individuals are successfully approaching a desired incentive, attention narrows to approach-relevant thoughts, and positive affect encourages sustained pursuit. When goals are disrupted by failure or uncertainty, however, anxiety discourages sustained pursuit, and attention fixes on the domain of threat for vigilant awareness of obstacles and alternatives. The vigilant distress persists until approach motivation can be reengaged, and refocused on a more tenable incentive. This model maps onto Carver and Scheier's (1998) model of self-regulation and is consistent with the central conclusion distilled by Gray & McNaughton's (2000) exhaustive review of lesion and drug studies on the behavioral inhibition system (BIS) in human and animal brains. Gray and McNaughton conclude that the main purpose of the BIS is to toggle organisms between absorption in succeeding goals and disengagement from floundering ones. Humans share this very old *self* regulation system with a wide variety of vertebrates that evolutionarily diverged hundreds of millions of years ago. When goals are disrupted by failure or uncertainty, the BIS activates hesitant, anxious vigilance until an alternative goal is engaged.

A relatively few hundred thousand years ago, the human capacity for abstract, self-reflective thought across time evolved as the prefrontal cortex began to bulge next to a brain region that coordinates goals into concrete actions. Abstract representations of self and worldview ideals can be thought of as high level goals that serve to give direction to the subordinate pyramid of lower level goals and actions (Carver & Scheier, 1998; Higgins, 1996). Just as there are projections from the BIS to the more concrete action areas, there are also elaborate projections from the BIS to the prefrontal cortex. Moreover, whereas lower level goal threats cause anxiety and vigilance in the domain of the threat for all vertebrates (Gray & McNaughton, 2000), *self* threats cause anxious self-focus for humans (Greenberg & Pyszczynski, 1986). Given these anatomical and functional parallels, it seems warranted to view high-level *self* ideals as superordinate goals that guide nested goals and actions. From this perspective, *self* threats are considered goal threats, and consequences can be understood in terms of ancient goal-regulation processes that humans share with pigeons and fish."

Accordingly, after *self* threats, people should react with vigilant self-focus and anxiety until a tenable replacement aspect of the self-concept can reengage the approach motivation system. In individualistic Western cultures in which independent selves are predicated on confident personal belief, zealous convictions are ideal replacements when self-goals are impeded. As ancient Greeks like Pythagoras and Plato proposed, contemplating ideal truths, unsullied by the compromises of temporal reality, can be an effective way to transcend earthly concerns, even about death (as Soc-

rates demonstrated). Ideal convictions can not be habituated to or contradicted because the ideal realm is immune to experience (cf. James, 1902/1958; Klinger, 1977, pp. 132–136). As such, zealous ideals can serve as transcendent beacons for buoyant approach when other goals get bogged down. Accordingly when daily goals for competence, autonomy, relatedness, cognitive consistency, control, or even survival feel compromised, idealized convictions about self and worldview can come to the rescue. They can reliably serve as compelling replacement goals to toggle the BIS away from anxious rumination and toward approach motivated resilience (see discussion for elaboration).

As such, fixing on confident, idealized convictions can be thought of as a strategy for alleviating preoccupation with threatening information (McGregor, 2004, in press; cf. Baumeister & Vohs, 2001). Moreover, confidence in the viability of one's zealous ideals is bolstered by perceived self-worth and consensus (i.e., "If I'm great and everyone agrees with me then I must be right;" cf. Baumgardner, 1990; Harding & Higgins, 1996). Thus, intergroup biases and worldview defenses—which are related to conviction, self-worth, and consensus—should be particularly attractive when important goals are threatened. Idealized pride, conviction, and consensus are powerful and reliable beacons for re-engaging approach motivation after threats because (a) as ideals they are resistant to disconfirmation by evidence or habituation from experience, (b) they uniquely and interactively bolster and structure the prime virtue of the Western self-concept: confident, knowledge of abstract truth and virtue (e.g., see Baumgardner, 1990; Campbell, 1990; Harding & Higgins, 1996; Shah, Kruglanski, & Thompson, 1998; Nisbett, Peng, Choi, Norenzayan, 2001; Tarnas, 1991; Tesser, Crepaz, Collis, Cornell, & Beach., 2000), and (c) they are readily available for defensive use because, as self-central concerns in Western cultures, they are highly accessible (Rogers, Kuiper, & Kirker, 1977).

Mortality Salience, Personal Uncertainty, and Other Threats as Goal Disruptions

Death is a poignant goal disruptor. Concrete plans are all terminated by death, as are most higher level self-goals. Goals for self-certainty and clear understanding are undermined. No one knows for sure what happens after death, and thoughts of death inflame existential uncertainty about how best to live life; McGregor, Zanna, Holmes, & Spencer, 2001; van den Bos, Poortvliet, & Maas, 2005). Goals for self-importance, worth, love, and inclusion are rendered absurd upon consideration of one's personal transience. Death thoughts are also poignant because mortality is undeniably self-relevant and cannot be dismissed as hypothetical. Indeed, mortality salience researchers have found that death thoughts cause defensive reactions only when death is contemplated experientially, and not when it is considered intellectually (Simon et al., 1997).

Death's experiential *self* threat to so many normative human goals may explain why contemplating death so reliably causes defensive zeal about opinions, values, and groups, but thinking about more hypothetical or mundane stressors does not. Contemplating scenarios about dental pain, public speaking, the prospect of becoming paralyzed in a car crash, intellectual meaninglessness, or difficulty finding employment after graduation have typically failed to cause zeal. Mortality salience researchers have reasonably taken this as evidence that zealous worldview defenses "are quite specific to the problem of death" (Solomon et al., 2004, p. 21), but another possibility is that experiential death thoughts pose especially poignant threats to self-relevant goals, and so need to be defended against particularly rigorously. Indeed as will be described in more detail in the next section, experientially poignant uncertainty threats seem to more reliably cause defensive zeal reactions than do abstract manipulations of hypothetical uncertainty (e.g., Landau et al., 2004, Study 4; but see van den Bos, Poortvliet, & Mass, 2005). Accordingly, the starting premise of the perspective presented here is that any manipulation that experientially threatens important self-goals should cause the same kinds of compensatory zeal reactions as mortality salience, such as proud reactions that bolster conviction and consensus about values, opinions, and groups. There is now considerable evidence that this is the case.

Defensive Zeal After Personal Uncertainty and Other *Self* Threats

Personal Uncertainty

Although peripheral uncertainties and mysteries can be delightful (Wilson, Centerbar, Kermer, & Gilbert, 2005), uncertainties about core goals, values, or identities can be an anguishing predicament (Baumeister, 1985; Durkheim, 1951; Erickson, 1968; Fromm, 1941; Sartre, 1943/1956). Accordingly, uncertainty associated with important personal dilemmas heightens aspects of zeal. In one study, dilemma uncertainty caused exaggerated conviction about unrelated social issue opinions (McGregor et al., 2001, Study 1). In another study, dilemma uncertainty caused participants to report more extreme communal values, and zeal about their personal projects (McGregor et al., 2001, Study 2). Similar dilemma uncertainty manipulation also caused Canadians to be less tolerant of Islam (Haji & McGregor, 2002), and to exaggerate their self-con-

cept clarity as assessed by response latencies to me–not-me decisions (McGregor & Marigold, 2003, Study 1) and to idealize their relationships (Marigold, McGregor, & Zanna, in press). Impressively, even a less personally poignant manipulation of uncertainty, that simply asks people to describe what happens to them when they feel uncertain, has also caused zeal reactions like those aroused by mortality salience (van den Bos et al., 2005; but see Landau et al., 2004, Study 4 for a null effect with this relatively bland uncertainty manipulation).

Other Epistemic Threats

Cognitive dissonance and interpersonal contradiction have also been found to cause aspects of exaggerated zeal. Cognitive dissonance induced by tricking participants to freely advocate an odious opinion caused them to more zealously defend their most important personal values (Tesser et al., 2000), and to exaggerate perceptions of social consensus for their opinions about social issues (McGregor & Nail, 2005). Reflecting on opinion disagreements also caused participants to exaggerate perceptions of objectivity for their unrelated opinions about a tense political conflict (Murukutla & Armor, 2005).

System Injustice

Contemplating real life breaches of system justice (Jost, Banaji, & Nosek, 2004) can also cause intergroup bias. Shortly after a corporate scandal in the southern United States exposed flagrant high level corruption (at Enron) and impotence of the legal system to punish the perpetrators, participants at a nearby university were exposed to information about corrupt Enron executives who had defrauded shareholders, profited from the scandal, and eluded prosecution. Exposure to this system injustice manipulation caused participants to exaggerate their preference for a pro-American author over an anti-American author (McGregor, Nail, Marigold, & Kang, 2005, Study 3).

Meaninglessness

Experiential manipulations that disrupt a sense of meaning in life (McGregor & Little, 1998) have also caused defensive zeal (Heine, Proulx, & Vohs, 2006). Heine, Mackay, and Akieda (in press) concocted a bogus meaningfulness scale with extreme anchors that made participants' typically meaningful behaviors seem trivial. Filling out this scale caused participants to recommend stronger punishments for people who offended their antiprostitution values. In a completely different manipulation of experiential meaninglessness, McGregor et al. (2001, Studies 3 & 4) had undergraduates visualize the scene of an important childhood memory, and then imagine how the scene of the memory would likely be changed if they returned at the age of 65. This concrete, experiential reminder of impermanent meanings not only caused participants to report higher scores on a seeking of meaning scale, but also caused more zeal about values, personal projects, communal identifications, and preference for an in-group supporter over an in-group critic. It is also important to note that, as with mortality salience, merely intellectual manipulations of meaninglessness have not caused defensive reactions (Baldwin & Wesley, 1996).

Loss of Control

Threats to personal control can have similar effects. Fritsche, Jonas, and Fankhänel (2005) found that East German participants reacted with zeal to the realistic prospect of long term unemployment, either due to being fired (control absent) or to quitting (control present). Participants who imagined being fired (control absent) exaggerated their relative preference for East over West Germans, and also heightened their preference for absolute, black and white personal goals over more tentatively framed personal goals.

In related research, thoughts about home invasion enhanced support for an in-group ideology (Navarrete, Kurzan, Fessler, & Kirkpatrick, 2004), and thinking about low control experiences caused exaggerated belief in benevolent God and government (Kay, Gauchier, & Napier, 2007).

Inferiority and Failure

Experiences that reflect negatively on self-worth also cause zeal. Two studies found that experienced failure at an academic task closely related to important academic goals resulted in exaggerated conviction and consensus estimates for opinions about social issues (McGregor et al., 2005; McGregor & Nail, 2005). Reflecting on academic or vocational failures also caused Canadian participants to derogate Islam (Haji & McGregor, 2002). Tesser et al. (2000) similarly found that self-demeaning upward comparisons caused people to more zealously promote their core values, and Dunning (2003) has found that failure feedback causes self-serving definitions of personality traits.

Relationship Insecurity

Threats to the high-level goal of relationship security can also cause zealous reactions. In one study, completing a guided imagery exercise about being in an inhospitable foreign country, cut off from contact with loved ones, caused exaggerated consensus estimates for personal opinions about social issues (McGregor et al., 2005, Study 2). In another study, re-

flecting on real life relationship problems inflamed conviction about social issue opinions (McGregor & Marigold, 2003, Study 3). Navarrete et al. (2004) further found that the prospect of social isolation caused intergroup bias.

Summary

Clearly, initial findings and claims that mortality salience has special status as a threat to cause zealous defenses now require qualification. The very same family of defensive zeal outcomes results when various high-level self goals are experientially threatened. Further, the common theme across the defensive outcomes may be more parsimoniously recognized as zeal than as symbolic immortality conferred by successful adherence to cultural values that preexist and survive the individual. Zealous reactions to mortality and other threats emerge even when the zeal is about idiosyncratic opinions and personal projects, with no obvious link to a cultural anxiety buffer (see McGregor et al., 2001, Study 4, and Gailliot & McGregor, 2005, Study 2 for evidence of idiosyncratic zeal reactions to mortality salience that are not obviously related to culture). The apparent interchangeability of poignant threats to cause zealous reactions that may or may not be related to a cultural anxiety buffer calls for an integrative theory of defensive zeal.

Zealous Personalities

Additional encouragement for an integrative theory comes from recent findings indicating that the same personalities react to both *self* threats and mortality salience with zeal. There is now considerable evidence that people with high self-esteem (HSE)[1] are most inclined to react with exaggerated aspects of zeal when faced with *self* threats (McGregor & Marigold, 2003; McGregor et al., 2005). At first blush, this seems problematic for integrating mortality salience research findings into a more general understanding of threat and defensiveness processes, because a key study by mortality salience researchers found least worldview defense after mortality salience among participants with HSE (Harmon-Jones et al., 1997). A closer assessment of the way that self-esteem was measured in that study, however, reveals that the HSE individuals were an unusual subset with particularly stable HSE. They were preselected from the very top of a mass-testing self-esteem distribution, and then were only retained for inclusion in the study if they were still extremely high in self-esteem ($M = 38.4/40$) when they returned for the experiment, weeks later. This selection criterion ensured that the HSE was a special subset that has proven particularly nondefensive (Kernis, 2003).

More recent investigations with a conventional self-esteem measure (Rosenberg, 1965) have found that high self-esteem is associated with most personal zeal and worldview defense after mortality salience[2] (McGregor & Gailliot, 2005; see also Baldwin & Wesley, 1996). It is important that the particularly defensive combination of low implicit self-esteem and high explicit self-esteem is especially defensive after mortality salience (Filardo, McGregor, & Kohn, 2006). This particularly reactive configuration of low implicit and high explicit self-esteem has been associated with various self-defensive tendencies (Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003) and with defensive zeal reactions to experiential failure and uncertainty threats (McGregor & Marigold, 2003; McGregor, et al., 2005). Thus, not only do the same defensive reactions arise from *self* threats as from mortality salience, but these same defensive reactions are moderated by the same personality variables. The similarity of reactions and of moderators suggests a similar underlying purpose and mechanism of zealous reactions to threats.

Zeal Attenuates Threat Salience

> It is the certitude of his infallible doctrine that renders the true believer impervious to the uncertainties, surprises and the unpleasant realities of the world around him. (Hoffer, 1951, p. 80)

Initial evidence has suggested that zealous reactions to separation, cognitive dissonance, academic failure, uncertainty, and mortality salience do, indeed, serve the same purpose—relieving preoccupation with threats (Greenberg, Arndt, Schimel, Pyszczynski, & Solomon, 2001; McGregor, 2004, 2006a; McGregor & Marigold, 2003, Study 4; McGregor et al., 2005, Study 4). Moreover, there is also mounting evidence that personality profiles theoretically and empirically related

[1]It is important not to confuse defensive zeal reactions with emotional reactions. There is some evidence that people with low self-esteem (LSEs) have stronger negative emotional reactions to threats than HSEs do (Dutton & Brown, 1997), but that HSEs have stronger defenses against threats than LSEs do (which may be why their emotional reactions are attenuated; McGregor & Marigold, 2003). It is also important not to confuse manipulations of self-worth with dispositional measures of self-worth when assessing the role of self-esteem as a moderator of defensiveness. Dispositional measures and manipulated states yield opposite results. HSEs are more defensive when faced with threat (McGregor & Marigold, 2003; McGregor et al., 2005), but situational affirmations decrease defensiveness (Sherman & Cohen, 2006).

[2]HSEs and LSEs may have different reasons for cleaving to in-groups when threatened. HSEs likely do it to bolster their own sense of agentic pride, LSEs to bolster security (Vohs & Heatherton, 2001). For this reason, the zeal moderating role of self-esteem may have been complicated in mortality salience research with intergroup bias-related dependent variables that reflect both agentic and communal incentives.

to repression, such as avoidant attachment style, narcissism, and high self-esteem (especially belied by low implicit self-esteem), are particularly adept at using zealous reactions to muffle threats (McGregor, 2006a; McGregor et al., 2005; Mikulincer & Florian, 2000). The emerging picture is that defensive people with a penchant for avoiding distressing thoughts react to poignant *self* threats with zeal because doing so helps muffle the threats.

My colleagues and I have recently investigated effects of zeal on the subjective salience of participants' troubling personal uncertainties. Our Subjective Salience scale assesses items such as the extent to which threatening thoughts feel hard to ignore, urgent, and pressing on one's mind at the moment. In five experiments (McGregor, 2004, 2006a) participants were first instructed to write about threatening personal uncertainties (a manipulation that has caused zeal in our past research). They were then randomly assigned to write essays either related to aspects of personal zeal, or related to similar but nonzealous topics. In the five experiments, writing about zeal related to opinions, values, successes, loves, or group identifications significantly decreased subjective salience of unrelated personal uncertainties. Moreover in four of the five studies the threat-salience-reducing effect of zeal was most pronounced among participants with the highest self-esteem.

Another intriguing finding across these subjective salience studies is that the threat-muffling effects of zeal persist even when threats have been made highly accessible by repeated reminders (McGregor & Nail, 2005). Thus, it cannot be that zeal functions as a simple distracter. Instead, zeal must somehow allow people to disengage from ruminative concern about the threat, even when the threat is highly accessible in focal attention. Thus, zeal appears to serve more as an insulator against threat than as a simple distracter.

Toward a Social Cognitive Neuroscience of Defensive Zeal

How might zeal confer such psychological immunity to threats? One reading of an intriguing review and findings by Martin and Shrira (2005) suggests the possibility that zeal may down-regulate distress and rumination about threats by engaging a suite of processes associated with the approach-motivation system, which may in turn inhibit avoidance-motivated anxious rumination. Martin and Shrira reviewed dozens of studies and presented new evidence indicating that perceiving and ruminating about experientially threatening phenomena, including mortality salience, is associated with relative right frontal cerebral hemisphere activation (see also Friedman & Forster, 2005), which has been associated with avoidance motivation in other research (Sutton & Davidson, 1997). They also reviewed evidence and presented new data showing that relative left hemisphere activation is associated with zealous defenses, value affirmations, stereotyping, and attention constricted to information relevant to dominant incentives or meanings (see also Shrira & Martin, 2005). Relative left hemisphericity is also associated with facilitated self-categorization judgments, approach-motivation and active, powerful, and strong feelings (Drake & Myers, 2006; Harmon-Jones & Allen, 1997; Kelley et al., 2002; Sutton & Davidson, 1997), and with self-reported purpose and meaning in life (Urry et al., 2004).

These findings are consistent with the idea that people turn to zealous meanings when faced with *self* threats because zealous thoughts represent idealized self-goal incentives that can reliably engage the sanguine myopia of approach motivation (Elliot & Thrash, 2002). If so, contemplating zealous ideals may be a particularly robust strategy for resilience in the face of challenges, as Pythagoras and Plato noticed long ago, and as the perennial appeal of religious fundamentalism attests (Tarnas, 1991). Zealous ideals may serve as reliable beacons that shift processing from right-hemisphere--mediated anxious rumination about threats, to left-hemisphere-mediated approach-focus and robust insulation from threats. With repeated use, zealous responses to *self* threats could become automatic and insulate individuals from threats immediately, before negative affect can coalesce (which could, at least partially, explain why negative affect is rarely found to mediate zealous reactions to mortality salience or other threats).

Such a proposal rests on the assumption that left-hemisphere-mediated approach motivation processes can inhibit right-hemisphere-mediated avoidance motivation processes. There is preliminary evidence that this is the case. Schiff and Bassel (1996) found that somatic priming of the left hemisphere not only facilitated an approach behavior (finger flexion) but also inhibited avoidance behavior (finger extension). Accordingly, Tomarken and Keener (1998) proposed that left-hemisphere-mediated approach-focus can facilitate emotional regulation (cf., Drevetz & Raichle, 1998, for a blood-flow account of interhemispheric inhibition). Indeed, a similar argument has even been made about emotional regulation in rats. According to Sullivan (2004) "the rat brain shows substantial hemispheric specialization in many respects, and while the right PFC is normally dominant in the activation of stress-related systems, the left may play a role in countering this activation through processes of interhemispheric inhibition" (p. 131).

Indeed, in humans, left hemisphere activation has been associated with repressive defensiveness (Carlsson, 1989; Tomarken & Davidson, 1994), and selective priming of the right hemisphere has been found to deactivate apparent repressive defensiveness in clinical patients with compromised right hemispheres (Ramachan-

dran, 1995; cf, Adair, Na, Schwartz, & Heilman, 2003). Most impressively, Amodio, Shah, Sigelman, Brazy, and Harmon-Jones (2004) recently found that promotion focus (i.e., accessibility of self-ideals to approach; assessed with a lexical decision task) was positively related to EEG activity in the left frontal cortex, $r = .51$, $p < .03$, and negatively related to EEG activity in the right frontal cortex, $r = -.46$, $p < .05$. Moreover, left frontal activity was also negatively associated with right frontal activity, $r = -.69$, $p < .001$, which is clearly consistent with the inhibition hypothesis. Given that the right hemisphere predominates during experience of negative emotion, and that the left is specialized for approach motivation, these findings may help explain why action-oriented individuals are so good at emotion regulation (Koole, 2004; Koole & Jostmann, 2004)

Indeed, exciting new research recently revealed that after experiential mortality salience or uncertainty threats, participants with high explicit self-esteem (which is correlated with action-orientation) reacted with exaggerated determination to accomplish their personal goals, and also with heightened relative activation in the left cerebral hemisphere (McGregor, 2006b). Other evidence suggesting that people may mask threats with left-hemisphere-mediated approach-motivation comes from research on anxious experience. Various researchers have found anxious experience to be associated with relative right hemisphere activation (e.g., Friedman & Forster, 2005, Study 3; Lee et al., 2004; Nitschke, Heller, Palmieri, & Miller, 1999; Tucker, Roth, Arneson, & Buckingham, 1977; van Strien & Morpurgo, 1992), especially among anxiously inclined individuals (Heller, Nitschke, Etienne, & Miller, 1997; see Kalin, Larson, Shelton, & Davidson, 1998, for similar findings with blood-cortisol levels in monkeys). It is important, however, that people with dispositionally anxious personality tendencies showed chronic relative left hemisphere activation (see Heller, Nitschke, & Miller, 1998 for review). Similarly, dispositional insecurity/vulnerability has been associated with conservative and closed patterns of thinking (Jost, Glaser, Kruglanski, & Sulloway, 2003), which are relatively left-hemisphere mediated (Martin & Shrira, 2005)

These finding are consistent with the idea that dispositionally anxious people may preemptively occupy themselves with patterns of thinking and acting that prime left hemisphere processes to down-regulate right-hemisphere-mediated anxious experience. Recent evidence suggests that, at a very basic level, motivated left-hemisphericity does afford immunity to anxiety. Disturbing pictures (some related to death themes) have been found to significantly accentuate relative right-hemisphericity and eye-blink startle responses to subsequent loud bursts of noise (Jackson et al., 2003; Lee et al., 2004). This is consistent with past evidence for right-hemisphere-mediated anxious vigilance after threats. However, Jackson et al. found that the magnitude of the exaggerated startle response after the offset of the threatening pictures was negatively correlated with relative left frontal EEG activity. Participants with relative left hemisphere activation were insulated from the usual startle-augmenting effects of the threatening pictures.

If the appeal of zeal is, indeed, the emotional insulation provided via approach-focused left-hemisphericity, then this may help explain why zealous ideologies seem so often associated with aggressive and antisocial social policies and initiatives. Left-hemisphere dominance has also been linked with anger (which has, in turn, been linked with approach-motivation), lack of sympathy, and impaired perspective-taking ability (Decety & Chaminade, 2003; Harmon-Jones, 2003; Harmon-Jones & Sigelman, 2001; Harmon-Jones, Vaughn-Scott, Mohr, Sigelman, & Harmon-Jones, 2004; Heberlein, Adophs, Pennebaker, & Tranel, 2003; Henry, 1993; Hewig, Hagemann, Seifert, Naumann, & Bartussek, 2004). Moreover, zealous belligerence may be further exacerbated by the decrements in creativity and capacity to process novel information that have been associated with relative left-hemisphericity (Atchley, Burgess, & Keeney, 1999; Bowden & Beeman, 1998; Fiore & Schooler, 1998; Friedman & Forster, 2005; Goldberg et al., 1994; Meyer & Peterson, 2000). Thus, defensive left-hemisphericity after threats may not only tend to swerve into antisocial belligerence, but may also get stuck there, unable to see outside the box of familiar and self-consistent conceptual frameworks (cf., Jonas, Greenberg, & Frey, 2003; Landau et al., 2004).

Discussion

The reviewed research supports the general contention that various threats to high level self-goals can cause exaggerated zeal to mask the threats. Together with evidence that the same combination of personality variables moderates defensive reactions to mortality salience and other *self* threats, these results call for an integrative theory of threat and defensiveness. The idea proposed here is that zeal is a kind of offensive defensiveness. It is an attractive reaction to mortality salience and other poignant self-threats because it activates approach-motivation processes, which down- regulate avoidance-motivated anxious rumination about blocked goals.

Is such an integrative perspective viable? Some arguments by mortality salience researchers have discouraged such integrative initiatives. One such argument appeals to evidence that diverse threats increase death thought salience and diverse defenses decrease it. Such evidence provides unsatisfying proof that death thoughts are the active causal ingredient across threat and defensiveness processes, however. Death is a highly negative concept, and so it is not surprising that a wide variety of threats and affirmations should associatively activate and deactivate

death thoughts, just as they would associatively activate and deactivate other highly negative concepts.

Perhaps the most important obstacle to a more integrative understanding of *self* threat, mortality salience, and defensiveness comes from the long standing history of reliance on metaphorical theorizing about the self. Philosophers and psychologists have proposed various compelling metaphors for why zealous convictions can be so rewarding in the face of threat. The ancient Greeks accounted for the allure of zealous ideas with the metaphor that transcendent ideals of perfect truth are the only true shining reality, and that, whereas absorption in unpredictable temporal matters is akin to being chained in shadowy darkness, approaching absolute truth is like finding the true sun. These seminal metaphors of Platonic idealism guided the evolution of Judaism, Christianity, and Islam (Armstrong, 1993), which have always had extremist sects devoted to pure and idealized doctrine. Fundamentalist devotees in all three faiths turn their backs on muddy temporal reality in preference for immersion in the ecstasies of mystic union with absolute and inviolable versions of sacred truth. It is interesting to note that the evolution of extremist agendas has followed a parallel path across the three faiths, in each case arising under conditions of threat (Armstrong, 2000). Accordingly, in his seminal survey of religious experience, James (1902/1958) concluded that religious rapture and moral enthusiasm are "unifying states of mind, in which the sand and grit of selfhood incline to disappear" (p. 240), They unify the "discordant self" (p. 399). Salvation metaphors by converts refer to newfound zeal as a refuge for their lost souls, or as illumination that dispels dark despair (see McGregor, 2007, pp. 177–180).

Psychological theorizing has also relied on vivid metaphors for understanding why zeal is so rewarding. In his first writings on repression, Freud proposed that "reactive," "supervalent thoughts" form "mental dams" that help keep unwanted thoughts at bay (as cited in Gay, 1989, p. 200, 261–262). Adler (Ansbacher & Ansbacher, 1956), Lewin (1935), and Horney (1950) similarly proposed that when faced with conflict, thwarted goals, or feelings of inadequacy, people hide behind flights of fantasy and delusions of grandeur. TMT is rooted in this neoanalytic repression theme, with its roots in the writings of Becker (1973). According to TMT, worldview defense provides a sense of symbolic immortality by allowing the individual to feel safely part of a larger worldview that transcends death because it preexists and survives the individual. This cultural anxiety buffer allows the individual to forget about death thoughts and carry on with equanimity. According to the TMT model, symbolic immortality is the key resource that zeal supports.

Self-affirmation theory is similarly rooted in neoanalytic ideas and metaphors. The central idea is explicitly linked (by Steele, 1988, p. 267) to Allport's (1943, p. 466) notion of "fluid compensation," i.e., that "mental health and happiness…does not depend upon the satisfaction of this drive or that drive, it depends rather upon the person finding some area of success somewhere." This idea of compensation goes back at least to Adler, who noted that even imagined success can relieve despair:

> Where he feels difficulty, fantasy helps to give him an illusory view of the enhancement of his self-esteem…fantasy, so to speak, is the compensation…Whenever the ambition of a person finds reality intolerable, he flees to the magic of fantasy.
>
> (Adler, 1927, as cited in Ansbacher & Ansbacher, 1956, p. 218).

Self-affirmation theory accounts for fluid compensation findings (whereby self-worth and consistency affirmations are interchangeable antidotes to various threats) by positing that affirmations related to worth and consistency feed into a common pool of global self-integrity (Sherman & Cohen, 2006). Global self-integrity is defined very broadly as the perception that one is "adaptively and morally adequate, that is, … competent, good, coherent, unitary, stable, capable of free choice, capable of controlling important outcomes, and so on" (Steele, 1988, p. 267). The metaphor is of a resource reservoir that threats detract from and affirmations replenish (Sherman & Cohen, 2006). Echoing Adler, self-affirmation theorists sometimes equate this resource with self-worth (e.g., Aronson, Cohen, Nail, 1999; Tesser et al., 2000).

As compelling and generative as these neoanalytically rooted models and metaphors have been, they have also been fractious. The central psychological metaphors of symbolic immortality and self-integrity resources have stimulated and guided a remarkably fertile growth of research findings, but the findings remain largely unintegrated across models because of moot theoretical disputes over the reified metaphors that explain fluid compensation. Everyone acknowledges evidence of fluid compensation, but they quibble about the common currency, e.g., is it symbolic immortality, or self-integrity, or uncertainty, or meaning, or control (Fritsche et al., 2005; Heine, Proulx & Vohs, 2006; Hogg, in press; van den Bos et al., 2005)?

What researchers know for sure is that various threats interchangeably cause defenses related to various aspects of zealous conviction, consensus, and self-worth, and these defenses help to quell rumination about the threats. Affirming these same aspects of zeal eliminates defensive reactions and rumination after various self-threats, including mortality salience (Koole, Smeets, van Knippenberg, & Dijksterhuis, 1999; McGregor, 2004, 2006a; Schmeichel & Martens, 2005; Sherman & Cohen, 2006). It seems that it may be time to cleave closer to the data, to acknowledge fluid compensation effects observed across models, and to strive for less

metaphorical and more integrative understandings of basic processes that can account for fluid compensation (van den Bos & Maas, 2006). Based on the preliminary evidence presented here, the approach-motivated cerebral-hemisphericity account may be a promising explanatory candidate. It can explain fluid compensation findings without the need to posit existence of a contentious common currency that diverse threats, affirmations, and defenses are converted into. To be sure, much further work is needed to more precisely track the exact neural pathways associated with threat, zeal, and the intra- and interhemispheric dynamics proposed. Even so, the provisional model presented here seems to hold promise for more integrative understandings across threat and defense literatures. It parsimoniously proposes that when *self* threats loom, zealous ideals are rewarding because they activate the sanguine myopia of the approach motivation system.

Notes

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