

This version of the manuscript is not the copy of record-there are differences between it and the final, published version. To access the copy of record, please consult: *Journal of Personality and Social Psychology*, 2010, Vol. 99, No. 1, 133–147

© 2010 American Psychological Association 0022-3514/10/\$12.00 DOI: 10.1037/a0019701

Anxious Uncertainty and Reactive Approach Motivation (RAM)

Ian McGregor, Kyle Nash, Nikki Mann, and Curtis E. Phills
York University

In 4 experiments anxious uncertainty threats caused reactive approach motivation (RAM). In Studies 1 and 2, academic anxious uncertainty threats caused RAM as assessed by behavioral neuroscience and implicit measures of approach motivation. In Study 3 the effect of a relational anxious uncertainty threat on approach-motivated personal projects in participants' everyday lives was mediated by the idealism of those projects. In Study 4 the effect of a different relational anxious uncertainty threat on implicit approach motivation was heightened by manipulated salience of personal ideals. Results suggest a RAM account for idealistic and ideological reactions in the threat and defense literature. Speculative implications are suggested for understanding diverse social and clinical phenomena ranging from worldview defense, prejudice, and meaning making to narcissism, hypomania, and aggression.

Keywords: threat, anxiety, uncertainty, ideals, approach motivation

To relieve anxiety some animals tenaciously run, lick, and bite. Indeed, some rats react to anxiety by running so eagerly on a wheel that they starve to death, and some dogs lick themselves to the point of skin lesions. Such compulsive “displacement behaviors” can seem bizarre because they have no obvious instrumental link to the eliciting anxiety (Antelman, Szechtman, Chin, & Fisher, 1975; Berridge, Mitton, Clark, & Roth, 1999; Rappaport, Ryland, & Kriete, 1992; Routenberg & Kuznesof, 1967; Uchiyumi, Aoki, Kikusui, Takeuchi, & Mori, 2008). Here we propose a reactive approach motivation (RAM) account of related reactions in humans.

Hypomania, smoking, and aggression have been viewed by psychoanalytic theorists as compulsive displacements to relieve anxiety (Dollard, Dobb, Miller, Mowrer, & Sears, 1939; Fenichel, 1945). Janis (1958, pp. 140–141), for example, noticed that in the anxious weeks leading up to their surgeries, patients seemed to show a kind of “surface euphoria”—a “forced hyperactivity” or “pseudo elation” belied by agitation—often involving fantasies of unlimited personal power and potential (see also Fenichel, 1945, pp. 407–411). The idea that people mask anxious uncertainty and motivational conflict with idealized extremes of confidence in the self or a social identity is a cornerstone of neoanalytic theories of defensive pride (Horney, 1950), self-superiority (Ansbacher & Ansbacher, 1956), and authoritarian hostility (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950; Fromm, 1941).

In the present laboratory research, we investigate a basic motivational mechanism that might account for such eager displacement

reactions in humans (and in other animals that share our uncertainty-linked neuropsychology of anxiety; Gray & McNaughton, 2000). Our starting premise is that RAM effectively provides insulation from anxious uncertainty through a kind of motivated tunnel vision that shields the impact of goal-irrelevant and dissonant information (Gable & Harmon-Jones, 2008; Harmon-Jones & Gable, 2009; Harmon-Jones & Harmon-Jones, 2002; Harmon-Jones, Harmon-Jones, Fearn, Sigelman, & Johnson, 2008; Klinger, 1975; Shah, Friedman, & Kruglanski, 2002). According to our palliative account, the domain of RAM may thus be wholly unrelated to the eliciting threat because RAM merely needs to provide an alternative focus for eager absorption. The eliciting anxieties will feel less bothersome because they are muted by the new goal focus.

For humans, thinking about cherished ideals may serve as an efficient and reliable focus for RAM. Ideals are self-defining, abstract goals that guide more concrete goals (Carver & Scheier, 1998; Higgins, 1996, 1997; Powers, 1973). Ideals can therefore serve as accessible alternative goals to approach when focal goals are compromised (Rogers, Kuiper, & Kirker, 1977). Humans can eagerly approach meaningful ideals, at least in part, by simply heightening imagined commitment to them (McGregor & Little, 1998). Private conviction for ideals is also relatively free from the risks of failure or critique that can hamper more temporal goals. Beyond their efficiency and reliability, ideals are also resistant to disillusionment and habituation because they can never be fully attained (Klinger, 1977). Promoting ideals as a means for RAM may therefore be an appealing human response to anxious uncertainty.¹

Ian McGregor, Kyle Nash, Nikki Mann, and Curtis E. Phills, Department of Psychology, York University, Toronto, Ontario, Canada.

This research was supported by grants from the Social Sciences and Humanities Research Council of Canada. Thanks to Denise Marigold, Jordan Peterson, and Mike Prentice for helpful comments.

Correspondence concerning this article should be addressed to Ian McGregor, Department of Psychology, York University, 4700 Keele Street, Toronto, Ontario M3J 1P3, Canada. E-mail: ianmc@yorku.ca

¹ Hypomanic episodes arising from anxious uncertainty and conflict have been described in psychoanalytic terms as being characterized by a self-perceived unification of the ego with superego ideals (Fenichel, 1945; see also Horney, 1950).

Anxious Uncertainty

Pharmacological, behavioral, and lesion studies on humans and other animals reveal a basic goal-regulation process that begins with the experience of anxious uncertainty (Gray & McNaughton, 2000). Anxiety arises when an animal is approach-oriented but simultaneously experiences punishment cues, evidence of frustrating nonreward, uncertainty, or threatening novelty. The essential anxiogenic predicament thus arises from the uncertainty of an approach-avoidance conflict. Even approach-approach conflicts among equally compelling alternatives, or novel circumstances, can become approach-avoidance conflicts to the extent that approaching one alternative implies frustration of others (Lewin, 1935). According to Gray and McNaughton (2000), the brain's septo-hippocampal system responds to such motivationally uncertain predicaments with anxiety; direct behavioral inhibition of the focal goal; and iterative, negative biasing of all goals. These responses are adaptive when they facilitate disengagement from predicaments that render goals uncertain and engagement in more viable alternative goals. When the septo-hippocampal system is lesioned, animals lose the capacity to extricate themselves from goal conflicts (Gray & McNaughton, 2000).

In their comprehensive review of animal and human research on the neuropsychology of anxiety, Gray and McNaughton (2000) were clear in emphasizing that anxiety essentially arises from uncertain predicaments (see also Peterson, 1999)—from cues signaling possible (but not certain) impedance of an active, approach-motivated goal. This core tenet of the neuropsychology of anxiety highlights a pivotal distinction between anxiety and other negative but nonconflicted states, such as panic. In contrast to uncertainty-rooted anxiety, which arises from simultaneously active approach and avoidance impulses, panic arises from clear and unambiguous avoidance motivation.

Gray and McNaughton (2000) illustrated this distinction with findings from research on hungry mice approaching food in cages smeared with the scent of a cat. The mice will continue to haltingly approach—but with anxious uncertainty and periodic rearing up to scan for a possible cat to avoid. In contrast, if a cat actually appears, the mice react with distinct and purely avoidant (panic-related) fight-or-flight reactions. Lesion and pharmacological studies show that different brain regions uniquely mediate anxiety versus fight-or-flight reactions (i.e., septo-hippocampal vs. periaqueductal gray, respectively; Gray & McNaughton, 2000).

In the present research, we focus exclusively on experimental threats designed to elicit anxious uncertainty. We use the term *anxious uncertainty* to distinguish it from merely informational uncertainty that does not threaten personal goals or cause anxious or ideological reactions in the threat and defense literature (McGregor, Prentice, & Nash, 2009; Van den Bos, 2009; cf. Sorrentino & Roney, 2000; Wilson, Centerbar, Kermer, & Gilbert, 2005). To do so we use face-valid manipulations of anxious uncertainty in the context of normatively important personal goals.

Important goals are more prone to anxiety than are trivial ones because reluctance to simply disengage from them when they are impeded maintains the uncertainty of approaching the goal and avoiding the impedance. In the present research, therefore, we operationalize anxious uncertainty in domains of our undergraduate participants' most important normative life tasks (relational and academic/career; Cantor, Norem, Niedenthal, Langston, &

Brower, 1987). In doing so, we target anxious uncertainty in contrast to benign uncertainty or other unpleasant but unconflicted negative arousal states (e.g., mere informational uncertainty with less bearing on personal goals in Studies 3 and 4 or aversion to dental pain in Study 1).

From Anxious Uncertainty to RAM

A cardinal feature of anxiety is heightened vigilance around the domain of the threat, which prepares the animal for the possibility of a transition to fight or flight, should it become necessary. Vigilance also helps the animal notice alternative routes for more viable goal pursuits. Once a viable alternative is identified, the anxious animal can surge toward it, restore clear approach motivation, and thereby relieve the uncomfortable symptoms of anxious uncertainty. With anxious uncertainty and vigilance relieved, uninhibited approach of a focal goal promotes the return to a kind of single-mindedness characteristic of committed approach-motivation whereby goal-irrelevant stimuli become less motivationally salient (Gable & Harmon-Jones, 2008; Harmon-Jones & Gable, 2009; Harmon-Jones & Harmon-Jones, 2002; Harmon-Jones et al., 2008; Klinger, 1975; Shah et al., 2002). Such single-minded states allow goals to be powerfully approached without distraction—obstacles to action and alternative perspectives become less salient as one's own impulses and perspectives predominate (cf. Csikszentmihályi, 1990; Galinsky, Magee, Inesi, & Gruenfeld, 2006; Guinote, 2007; Keltner, Gruenfeld, & Anderson, 2003).

The capacity to tenaciously lock and load on an alternative goal can be adaptive when it facilitates appropriate goal switching and maintains viable goal pursuit. The premise of the current research, however, is that tenacious absorption in an alternative goal can also be engaged for merely palliative purposes. In the face of anxious uncertainty, RAM focused on any compelling goal (or ideal) may be immediately rewarding insofar as it insulates the individual from the eliciting anxieties. RAM may thus be engaged simply for relief of distress without regard for longer term consequences.

The motivational tunnel vision associated with active approach motivation may partially account for why neural markers of approach motivation are so robustly associated with well-being and decreased reactivity to threatening or risky stimuli (Elliot, 2008). Relative left frontal brain activity is a robust indicator of both dispositional and situational approach-motivation tendencies (Elliot, 2008), and approach-related brain activity induced by biofeedback has been found to inhibit goal conflicts (Harmon-Jones et al., 2008). Approach-related brain activity also predicts happiness and meaning in life (Urry et al., 2004) and lower reactivity to risky and noxious stimuli (Gianotti et al., 2009; Jackson et al., 2003). Moreover, two recent studies demonstrate that approach-motivated patterns of electroencephalographic (EEG) activation are significantly correlated with less anxious reactivity in the anterior cingulate cortex (which registers conflict and uncertainty) after Stroop-task errors (Nash, McGregor, & Inzlicht, 2010). Behavioral neuroscience markers of relative left cerebral hemisphericity similarly predict vigorous, powerful, and robust approach-motivation-related mood states (Drake & Myers, 2006). There is thus converging theoretical, experimental, neural,

and behavioral neuroscience precedent for the expectation that RAM should be a rewarding response to anxious uncertainty.

Ideal Approach

From the RAM perspective, when faced with anxious uncertainties people would be expected to turn to their ideals, ideologies, meanings, and worldviews with heightened tenacity and vigor (cf. Heine, Proulx, & Vohs, 2006; Hogg, 2007; McGregor, Zanna, Holmes, & Spencer, 2001; Peterson, 1999; Van den Bos, Poortvliet, Maas, Miedema, & Van den Ham, 2005). Doing so could serve the same displacement function as other animals' more concrete reactive compulsions, but with little expenditure of resources. Ideals are abstract goals (Carver & Scheier, 1998; Higgins, 1996), and merely thinking about them can activate the pattern of left-frontal cerebral hemisphericity that characterizes approach motivation (Amodio, Shah, Sigelman, Brazy, & Harmon-Jones, 2004). Ideals may thus provide a particularly efficient and reliable focus for RAM because ideals are relatively impervious to temporal frustrations and can be readily promoted in the privacy of one's own imagination, free from failure or critique. As Lewin (1935, pp. 56, 103, 145, 178–179) observed, conflicts among "simultaneously present psychical tensions" can cause "flight into unreality" or "fantasy," to "unreal planes of hopes and dreams" where there are no reality checks on the goals one constructs. Becoming idealistic may therefore be an attractive way for humans to activate RAM and gain relief in the face of conflicts and uncertainties.²

Past research has shown that anxious uncertainties do indeed cause people to promote their ideals and meanings. For example, in a study by McGregor et al. (2001), participants reacted to personal dilemmas or existential uncertainties by cleaving to more idealistic and meaningful values, identities, and personal projects in their lives (Studies 2 and 4); they also reported a stronger desire to find meaning in life (Study 4) and to eagerly defend their consensual worldviews (Studies 1 and 3; see also, e.g., Hogg, 2007; Landau, Greenberg, & Sullivan, 2009; Landau, Greenberg, Sullivan, Routledge, & Arndt, 2009; Proulx & Heine, 2008; Van den Bos et al., 2005). Past work has also shown that salient uncertainties lose their sting if participants are given a chance to express their ideals, values, convictions, identifications, and meanings (McGregor, 2006b; McGregor, Haji, & Kang, 2008; McGregor & Marigold, 2003, Study 4; McGregor, Nail, Marigold, & Kang, 2005, Study 4; McGregor et al., 2001, Study 1).

Dozens of studies inspired by terror management theory (TMT) have similarly found mortality salience to heighten conviction for cultural, worldview, and positive-self ideals (reviewed in Solomon, Greenberg, & Pyszczynski, 2004; see also Greenberg et al., 2003, and Van den Bos et al., 2005, for evidence that it is the anxiety and uncertainty associated with mortality salience that causes the worldview defense). Even subtle anxiety-inducing novelty cues in the environment can cause similar worldview defense reactions, which disappear if anxiety can be quelled in some other way (Proulx & Heine, 2008). Other research has linked anxious uncertainty to the need for a rigid ideology (Jost, Glaser, Kruglanski, & Sulloway, 2003) and to heightened conviction for personal values, ideals, and religious orientations (McGregor & Marigold, 2003; McGregor et al., 2005; McGregor, Nash, & Prentice, in press; McGregor et al., 2001).

Such idealistic reactions to anxious uncertainty do not result after other kinds of negative arousal states or after reminders of merely informational kinds of uncertainty (Van den Bos, 2009). Dozens of studies, for example, have shown that being reminded of the experience of dental pain causes as much generalized negative affect as does being reminded of mortality salience. Dental pain reminders do not, however, cause the ideological reactions that experiential mortality or uncertainty reminders cause (McGregor & Jordan, 2007; Solomon et al., 2004).

Recently researchers further compared the effects of conflict-related aversive experiences with serious but non-conflict-related aversive experience (McGregor, Prentice, & Nash, 2009). Participants were randomly assigned to describe how they felt about (a) "an important goal you are pursuing that is not going very well and is impeded by a frustrating obstacle or obstacles," (b) "a current situation in which you feel torn in deciding between similarly promising goals, but really you can only afford to pursue one," or (c) "a big problem that is currently making you seriously reassess who you are as a person, your values, and/or how the world works around you" (a topic at least as aversive as the others but less conflicted because the individual has disengaged). The dependent variable was a five-item scale that assesses the extent to which participants were "looking," "searching," and "seeking" "meaning," "purpose," and "mission" in life (Steger, Frazier, Oishi, & Kaler, 2006, p. 93).

Results showed that the goal-conflict conditions ([a] and [b]) each caused significantly more meaning seeking than did the nonconflicted serious problem condition (for similar reactive meaning-seeking findings see McGregor et al., 2001, Study 4). Goal conflict is one of the predicaments that can reliably put people in a motivationally uncertain and therefore anxious state (Gray & McNaughton, 2000). Thus, previous research specifically links predicaments related to anxious uncertainty with idealistic and meaning-seeking reactions. The main novel purpose of the present research is to provide an integrative framework for understanding such idealistic reactions—from meaning seeking and value conviction to ideological extremism and worldview defense—that are currently explained by competing theories in the literature.

Overview

In four experiments we test the RAM hypothesis with face-valid manipulations of anxious uncertainty that have caused anxious

² The privacy of ideals and meanings may also protect them from reality constraints and allow them to gravitate toward unrealistic conviction and utopian extremes. Extremes may provide particularly reliable solace in the face of anxious uncertainty because conflict-related distress is experienced to the extent that the conflicting elements have equally strong valences. The mathematical formula that best predicts the amount of felt discomfort arising from cognitive conflict is the square of the valence of the weaker of the conflicting elements divided by the stronger of the conflicting elements (Newby-Clark, McGregor, & Zanna, 2002). Amplifying an extreme position in either direction exponentially increases the denominator of the ambivalence formula and accordingly decreases distress. Approach of ideological extremes, then, might be a particularly reliable avenue for RAM. Not only are ideals readily available and efficient, but ideological extremes are also reliable foci that are themselves structurally immune to anxious uncertainty.

experience, ideological extremes, and worldview defenses in past research. Studies 1 and 2 assess whether anxious uncertainty-threats will cause behavioral neuroscience and implicit evidence of RAM. Study 3 tests whether the effect of anxious uncertainty on personal project approach motivation is mediated by idealism. Study 4 assesses whether an experimentally manipulated focus on ideals will augment the effect of anxious uncertainty on the implicit measure of approach motivation used in Study 2. The RAM account would be supported if threats that have caused ideological extremes in past research also heighten approach motivation, mediated and moderated by salience of ideals.

Study 1

We manipulated anxious uncertainty about academic aptitude and then assessed a behavioral neuroscience measure of approach motivation. This measure has correlated significantly in past research with approach-motivation-related affect (Drake & Myers, 2006) and with the precise pattern of EEG activity in the dorso-lateral prefrontal cortex that is characteristic of approach motivation (Nash, McGregor, & Inzlicht, in press).

Method

Thirty-six second-year psychology students (seven male; mean age = 21 years) completed all materials during the half-time break in a 3-hr personality psychology lecture. Participants first completed the experimentally manipulated anxious uncertainty or dental pain control condition materials. After waiting until the slowest participant was finished (modal wait time of 3 min), all were instructed to turn the experimental manipulation materials upside-down on their desk, and the behavioral neuroscience measure was distributed and completed.

Anxious uncertainty manipulation (academic). The anxious uncertainty manipulation was designed to induce uncertainty in the domain of participants' important academic goals. Participants randomly assigned to the anxious uncertainty condition were required to summarize an extremely difficult, one-page statistics passage on LISREL, structural equation modeling. It was presented as a popular tool for analyzing data in psychology, and we claimed to be interested in assessing how well they could understand and summarize it in 5 min. The passage was taken out of context and included complicated formulae, statistical terms, and mathematical symbols (from Pedhazur, 1982, pp. 639–640). Key sentences were also deleted to make it even more confusing. Participants in the dental pain control condition were instead randomly assigned to write about the experience of dental pain at the dentist. Although highly aversive, thoughts about dental pain do not arouse uncertainty about goal pursuit.

Previous research has shown that the primary affective reaction to the LISREL manipulation of anxious uncertainty is specifically uncertainty-related (McGregor, Haji, Nash, & Teper, 2008). For example, this same anxious uncertainty manipulation caused significantly more uncertain, frustrated, and confused feelings (in that order of effect magnitude; $ps < .001$) than in a control condition. It also caused threatened participants to feel less good and successful ($ps < .005$) than participants in the control condition, but the specific effect on feelings of uncertainty remained significant even when the other negative and positive adjectives were statis-

tically controlled. In addition to being a poignant anxious uncertainty threat, this manipulation also reliably causes participants to become more ideologically extreme. It has caused more extreme and fervent conviction for personal and political values, more zealous religious commitment, and even willingness to support religious warfare (McGregor, Haji, Nash, & Teper, 2008; McGregor & Jordan, 2007; McGregor et al., 2005; McGregor et al., in press).

The modal 3-min wait time after the anxious uncertainty materials served as the short delay that has been found necessary in past research to allow time for uncertainty-related threats to reemerge after a period of proximal threat suppression (see Wichman, Brunner, & Weary, 2008; cf. Pyszczynski, Greenberg, & Solomon, 1999). At the end of the study, participants were fully debriefed and assured that the threat materials had no actual bearing on their own abilities. The track record of this anxious uncertainty manipulation in causing anxious uncertainty, and also in causing reactive idealism, makes it a good initial candidate for testing our novel hypothesis that the same threats that cause defensive ideology will also cause RAM.

Relative left cerebral hemisphericity. Links between left-frontal asymmetry and approach motivation were first noticed in patients with focal lesions to the left or right cerebral hemisphere, which tended to result in depressive or manic symptoms, respectively (Elliot, 2008). More recently, in dozens of studies relative left-frontal EEG activity has consistently been associated with approach motivation and related constructs—such as behavioral activation, risk taking, positive mood, and anger (Elliot, 2008)—and with a tenacious focus on goal-related phenomena and inhibition of conflicting cognitions (Harmon-Jones & Gable, 2009; Harmon-Jones et al., 2008).

In the present study we used the line bisection task to assess relative left cerebral hemisphericity. Participants made tick marks at what they perceived to be the center point on each of 14 staggered lines presented on a horizon-view sheet of paper. Each line was approximately 24 cm long. Estimation errors to the right reflect an overnoticing of the right visual field characteristic of relative left cerebral hemisphericity (Jewell & McCourt, 2000). Thus, we computed the index of relative left cerebral hemisphericity by subtracting each participant's number of left-of-center ticks from right-of-center ticks. Experimentally elicited active approach motivation has been associated with relative left hemisphericity on a similar measure in past research (Friedman & Forster, 2005, Study 3). Rightward errors on the line bisection task are also significantly and specifically correlated with the pattern of relative left-frontal EEG activation characteristic of approach motivation (i.e., at frontal F7 vs. F8 sites; Nash et al., in press).

Various factors such as the tendency of people to read from left to right and to write with their right hands make it difficult to interpret line bisection task results as an index of absolute differences in hemispheric activation (e.g., McCourt, Freeman, Tahmahkera-Stevens, & Chausee, 2001). For our purposes, however, the line bisection task serves adequately for measuring changes in relative left cerebral hemisphericity caused by the randomly assigned anxious uncertainty threat (we accordingly report standardized results). To reduce error variance we controlled for dispositional differences in participants' line bisection tendencies by including as a covariate in our main analysis the same measure of relative left cerebral hemisphericity assessed

under neutral conditions 1 week later. Six participants did not return for the Time 2 line bisection task reassessment, which left 30 participants for the main analysis (five male; mean age = 21 years).

Results

The line bisection task measure of relative cerebral hemisphericity was reliable, with a test–retest correlation of $r(30) = .71$, $p < .001$. An analysis of covariance controlling for Time 2 line bisection scores revealed significantly more relative left cerebral hemisphericity (i.e., more rightward errors) in the anxious uncertainty condition ($Z = .27$) than in the control condition ($Z = -.30$), $F(1, 27) = 5.45$, $p < .05$. This encouraging behavioral neuroscience evidence is necessary but not sufficient support for the RAM hypothesis. Studies 2–4 were conducted for multimethod convergence.

Study 2

Study 2 was designed to provide implicit support for the behavioral neuroscience evidence of RAM found in Study 1. For the implicit measure of RAM we assessed the strength of association between the self and the concepts of approach versus avoidance following the same academic anxious uncertainty manipulation as in Study 1. To do so we created a self–approach version of the implicit association test (IAT). The IAT has been adapted in past research to measure the strength of association between the self and various concepts including social categories (e.g., Devos & Banaji, 2005; Greenwald, Pickrell, & Farnham, 2002; Pinter & Greenwald, 2004), stereotypes (e.g., Rudman, Ashmore, & Gary, 2001), academic constructs (e.g., Kawakami, Steele, Cifa, Phills, & Dovidio, 2008; Nosek, Banaji, & Greenwald, 2002), and self-esteem (Greenwald & Farnham, 2000). We predicted that the uncertainty threat manipulation would cause participants to more readily associate the self with approach relative to avoidance.

Method

Seventy-five undergraduates (gender undisclosed; mean age = 20 years) completed an online study in exchange for course credit. Upon logging in to the study website, participants read that the first study would assess their ability to understand statistics. After they were randomly assigned the anxious uncertainty or control condition materials, adapted for the Internet from Study 1, participants read that the second study would assess cognitive processes. They then completed the dependent variable that assessed implicit associations between the self and approach versus avoidance—what we will refer to as an approach IAT.

Anxious uncertainty manipulation (academic). Participants randomly assigned to the anxious uncertainty condition were given 2 min to process the confusing one-page passage about statistics from Study 1. After 2 min, the screen advanced and they were given 2 more min to summarize what they had read. Participants randomly assigned to the control condition completed similar materials but with reference to a simple paragraph about why statistics are useful in science. After this manipulation of the independent variable, for approximately 3 min all participants read instruction screens to set up the second study assessment of the

approach IAT dependent variable. This delay also allowed time for defenses to emerge (Wichman et al., 2008).

Approach IAT. We presented participants with a version of the IAT that measured the relative strengths of association between the self and approach-related words versus avoidance-related words. Participants were required to categorize stimulus words that appeared in the center of the screen according to the categories of approach versus avoidance or self versus other. In the critical self–approach block of trials, the category words *self* and *approach* appeared together in one upper corner, and the category words *other* and *avoidance* appeared together in the other upper corner of the computer screen. Participants were required to use the same key to categorize words related to the self (*I, me, mine, self*) and approach (*advance, pursue, forward, reach*) and another key to categorize words related to other (*them, they, their, other*) and avoidance (*retreat, withdraw, flee, reverse*). In contrast, in the other critical block of self–avoidance trials, the category pairings were reversed, and the category words *self* and *avoidance* appeared together in one upper corner, and the category words *other* and *approach* appeared together in the other upper corner. Each critical block consisted of 60 trials. The order of the critical blocks was counterbalanced between participants.

Participants were told to respond to stimuli as quickly as possible while remaining as accurate as possible. After making correct responses on a trial, participants were presented with a blank screen for 1,000 ms before the next trial. After making incorrect responses on a trial, participants were presented with a blank screen for 100 ms followed by a red X in the middle of the screen for 800 ms and then another blank screen for 100 ms before the next trial. For each critical block of trials we averaged the latency of participants' correct responses. We computed approach IAT scores by subtracting the mean latency of correct responses in the self–approach block of trials from the mean latency in the self–avoidance block. Higher scores, in ms, thus represent higher implicit approach, that is, participants' relative facility with self–approach versus self–avoidance joint categories.

Manipulation check. During the manipulation check at the end of the study, participants were asked to recall the anxious uncertainty manipulation materials they had completed and to rate how they had made them feel on a scale ranging from 1 (*not at all . . .*) to 5 (*extremely . . .*) concerning the following adjectives: *Good, Happy, Smart, Successful, Likeable, Meaningful, Frustrated, Confused, Uncertain, Empty, Anxious, Insecure, Lonely, Ashamed, and Stupid*.

Results

Manipulation check results revealed that participants in the anxious uncertainty condition felt significantly worse than did those in the control condition on the following adjectives: *Confused* ($M = 3.65$ vs. $M = 2.76$, respectively, $p = .002$), *Uncertain* ($M = 3.43$ vs. $M = 2.73$, $p = .02$), *Ashamed* ($M = 2.37$ vs. $M = 1.79$, $p = .03$), and *Stupid* ($M = 2.29$ vs. $M = 1.76$, $p = .04$). Differences between conditions on all other adjectives were non-significant.

The absence of significance for the *Anxious* item may reflect the notoriously poor reliability of self-reported anxiety after threatening experiences that has inspired research relying on indirect methods to demonstrate that anxiety drives defensive reactions to

anxiety-related predicaments (e.g., Greenberg et al., 2003; Kay, Moscovitch, & Laurin, 2010; Proulx & Heine, 2008; Zanna & Cooper, 1974). Given the close theoretical links between aversive, experiential uncertainty and anxiety (Gray & McNaughton, 2000; Van den Bos, 2009), however, it seems warranted to conclude that in the present study, anxious uncertainty was likely aroused and not just a pleasant or benign uncertainty that would not be expected to cause RAM (McGregor, Prentice, & Nash, 2009; Wilson et al., 2005).

For the main analysis, outlier latencies less than 300 ms and greater than 2,000 ms (3.01%) were recoded to 300 ms and 2,000 ms, respectively, and all incorrect answer trials (6.4%) were excluded from analysis. Results revealed higher implicit approach in the anxious uncertainty condition ($M = 174.19$) than in the control condition ($M = 60.56$), $t(71) = 3.80$, $p < .01$. This finding conceptually replicates the behavioral neuroscience results from Study 1 with a radically different, implicit measure of approach motivation. Studies 3 and 4 were conducted to provide further convergent evidence for RAM after anxious uncertainty threats in relational rather than academic domains.

Study 3

We designed Study 3 to conceptually replicate the results of Studies 1 and 2 and to directly investigate the proposed link between reactive idealism and RAM. For further multimethod convergence, we manipulated anxious uncertainty about personal relationships (instead of academics as in Studies 1 and 2) and measured RAM in the context of participants' most self-characteristic personal projects. We focused on personal project dimensions related to eagerness and tenacity, which are central qualities of approach motivation (Carver & Scheier, 1998; Drake & Myers, 2006; Elliot, 2008; Keltner et al., 2003).

In addition, we also measured personal project dimensions related to participants' guiding ideals, values, and meanings (McGregor & Little, 1998; McGregor et al., 2001). Doing so allowed us to probe our hypothesis that for humans, reactive idealism is a normative mechanism that mediates engagement in RAM. We further measured dimensions related to avoidance motivation to determine the extent to which anxious uncertainty specifically arouses RAM and not just reactive motivation more generally. Finally, we measured the agentic and communal domains of participants' personal projects to assess the extent to which RAM is a basic, domain-general response to anxious uncertainty. We did not expect RAM to be domain-specific, because in our account RAM is merely palliative.

Method

A total of 158 undergraduates (24 male, 34 undisclosed; mean age = 22 years) completed all materials during the half-time break in a 3-hr personality psychology lecture. The uncertainty threat materials were followed by the same delay as in Study 1, with a modal wait time of 3 min while participants waited for the last participant to complete the experimental materials. Next, for the dependent variable we adapted personal projects analysis materials (Little, 1983, 1993; Little, Salmela-Aro, & Phillips, 2007) to assess

the extent to which participants' personal goals were approach-motivated.

Anxious uncertainty manipulation (relationship dilemma). Participants randomly assigned to the anxious uncertainty condition were given the following instructions, which required immersion in current conflicts and uncertainties about their interpersonal goals in life (adapted from McGregor et al., 2001, and Taylor & Gollwitzer, 1995):

Please take a minute to think of an unresolved dilemma in your life that has something to do with your interpersonal relationships. You are not yet sure whether to leave things as they are or make a change. You feel very uncertain, but haven't yet decided what to do. The dilemma should be complex and should take the form of "Should I make a change . . . or not?" Please briefly name your interpersonal dilemma. What personal value makes you want to make a change from the way things are right now? What personal value makes you want to not change anything, and leave things as they are right now? How does this dilemma make you feel? List any possible future consequences that could result if you opted for changing things. List possible future consequences that could result if you left things the way they are and did not make a change.

Participants who were randomly assigned to the control condition answered the same questions but about a dilemma that a friend was facing. In past research this uncertainty threat specifically caused feelings of anxious uncertainty (e.g., "bothered," "uneasy," "uncomfortable," "torn," and "of two minds") but not general negative or positive affect (McGregor et al., 2001, Studies 1 and 2). It also caused participants to react with idealistic conviction about value-laden opinions and intergroup attitudes (McGregor, Haji, Nash, & Teper, 2008, Study 2; McGregor et al., 2001, Studies 1 and 2).

Personal project approach. For the personal projects analysis materials, participants were given 2 min to list all the current personal projects in their lives that they could think of. They then selected the four projects that were most representative of themselves and rated each using a scale from 0 (*not at all*) to 10 (*extremely*) on five dimensions theoretically linked to approach motivation (Drake & Myers, 2006; Elliot, 2008; Higgins, 1997; Keltner et al., 2003): Approach ("To what extent does it focus on approaching something positive?"), Promotion ("To what extent does it focus on promotion of good things that you have high hopes for?"), Determination ("How firmly determined are you to complete it, even if it requires sacrifices?"), Outcome ("How likely are you to ultimately succeed at it?"), and Competence ("To what extent do you feel competent and able to pursue it?"). As in past personal projects research (McGregor & Little, 1998; McGregor et al., 2001; Palys & Little, 1983), we relied on participants' self-ratings because we assumed that they were the most discriminating judges of the personal meaning and function of their own projects (Little, 1983, 1993; Little et al., 2007).

In a pilot study with 109 participants, this five-dimension measure of personal project approach was unifactorial and internally consistent (Cronbach's $\alpha = .79$). Its validity as a measure of approach motivation was supported by its significant correlations ($ps < .01$), with personality traits theoretically related to approach motivation: behavioral activation (Carver & White, 1994), $r(109) = .28$; action control (Kuhl, 1994), $r(109) = .25$; promotion focus (Lockwood, Jordan, & Kunda, 2002), $r(109) = .36$; purpose in life (Crumbaugh & Maholick, 1964), $r(109) = .44$; purpose and

personal growth (Ryff, 1989), $r_s(109) = .37$ and $.40$, respectively; self-esteem (Rosenberg, 1965), $r(109) = .34$; and narcissism (Raskin & Hall, 1979), $r(109) = .27$. Consistent with our palliative view of RAM, this measure of personal project approach was negatively correlated with self-reported life stress on the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983), $r(109) = -.29$. Finally, personal project approach was not correlated with social desirability (Crowne & Marlowe, 1960), $r(109) = .02$, *ns*.

Personal project idealism. Participants also rated their personal projects on five dimensions related to the extent to which the goals reflected the most meaningful ideals or values that guided their lives: Value Congruence (“To what extent does it reflect the most important values that guide your life?”); Conviction (“How certain do you feel that this is a project that you want to devote yourself to?”); Self-Identity (“To what extent does it reflect the kind of person you really are, at your core?”); Ideals (“To what extent does it feel like something you truly and ideally want to be doing, regardless of what you feel you should be doing?”); and Personal Choice (“To what extent did you choose it, i.e., not dictated to you by other people or circumstances?”). In the same pilot study as mentioned in the previous section, an index of personal project idealism from the mean of these ratings was also unifactorial and reliable (Cronbach’s $\alpha = .79$).

Personal project avoidance. Three dimensions assessing personal project characteristics related to avoidance motivation gauged the extent to which the anxious uncertainty manipulation specifically stimulated RAM and not just reactive motivation in general: Avoid (“To what extent does it focus on avoiding something negative?”); Prevention (“To what extent does it focus on preventing bad things from happening?”); and Should (“To what extent does it feel like something that you SHOULD be doing, regardless of what you would ideally like to be doing?”).

Personal project agency and communion. Finally, two dimensions measured the agentic and communal domains of participants’ personal projects to assess the extent to which RAM is domain-general rather than -specific. Given our view of RAM as a very basic, domain-general process, we expected a generalized, nonspecific response, with null effects on the following domain-specific dimensions: Togetherness (“To what extent are you doing it to feel close to other people?”) and Work (“To what extent is it focused on accomplishing goals at school or work?”).

Results

As in the pilot study, the personal project approach and idealism measures were again unifactorial and reliable, and each had a Cronbach’s alpha reliability of $.83$. As predicted, participants in the anxious uncertainty condition reported significantly higher personal project approach ($M = 8.38$) than did participants in the control condition ($M = 7.95$), $\beta = .20$, $t(157) = 2.51$, $p = .01$. They also reported significantly higher personal project idealism in the anxious uncertainty condition ($M = 8.30$) than in the control condition ($M = 7.74$), $\beta = .25$, $t(157) = 3.18$, $p < .005$. Consistent with the hypothesis that people turn to idealistic goals as a reliable and economical way to activate approach motivation, the effect of the anxious uncertainty manipulation on personal project approach was entirely mediated by personal project idealism. Personal project approach and idealism were highly correlated, $r(158) = .80$, $p < .001$, and inclusion of the idealism term in the regression of

approach motivation on threat completely eliminated the significant personal project approach beta, reducing it from $.20$ to 0 .

There was less support for the reverse mediational possibility. Including personal project approach as a covariate in a regression of personal project idealism on threat only partially reduced the idealism beta, from $.25$ to $.09$, which approached significance ($p < .06$). These mediational analyses provide some statistical support for the primacy of reactive idealism as a lever for RAM. Study 4 returns to this question with an experimental design to more adequately test the causal assumption suggested by the mediational analyses in Study 3.

Finally, additional analyses revealed that the significant surge in idealistic RAM was specific to approach but not avoidance. The effect of anxious uncertainty on personal project avoidance motivation was nonsignificant ($|t| < 1$). Moreover, RAM was not constrained to either communal or agentic pursuits. There were null effects of the anxious uncertainty manipulation on the personal project dimensions of Togetherness and Work (both $|t| < 1$), consistent with our assumption that RAM can be merely palliative and not necessarily aimed at restoring any particular threatened goal.

In sum, Study 3 demonstrates that the RAM effects found in Studies 1 and 2 are domain-general. They can result from either academic or relational anxious uncertainty, and they are relieved by a surge in general idealism that does not appear to be domain-specific. The involvement of ideals in RAM processes is potentially important, because it could provide the basis for understanding a wide range of enigmatic idealistic and ideological phenomena (to be discussed in the General Discussion section). Study 4 accordingly probes the role of ideals with an experimental method to allow more confident conclusions about the causal role of ideals as a lever for RAM.

Study 4

The results of Study 3 revealed a close empirical link between ideals and RAM. Study 4 was designed to replicate that association with the implicit measure of RAM used in Study 2 and with an experimental manipulation of ideals. If focus on ideals mediates the effect of anxious uncertainty on RAM, then priming participants with a focus on active ideals should facilitate RAM (see the Spencer, Zanna, & Fong, 2005, recommendation for using experimental moderation to establish mediation).

Method

Sixty-four undergraduates (gender undisclosed; mean age = 20 years) in an introductory psychology course completed an online study for course credit. The experimental manipulation of ideal salience preceded the anxious uncertainty manipulation, which was followed by the implicit approach dependent variable, assessed as in Study 2. Upon logging in to the study website, participants read that the first study would involve recalling aspects about themselves from the past and that the second study would involve recalling instances of relationships.

Ideal salience manipulation. In the ideal salience condition, participants were randomly assigned to complete a promotion focus exercise. It required them to write about current hopes and aspirations they would ideally like to accomplish and how these

differed from the ideals that guided them when they were children. In the ideal nonsalience condition, participants instead completed a prevention focus exercise that required them to write about their current duties and responsibilities that they ought to attend to and how these differed from those they had as young children (Higgins, Roney, Crowe, & Hymes, 1994). Participants were given 4 min for this task, after which the screen automatically advanced.

Anxious uncertainty (troubled relationship). In the anxious uncertainty condition, participants identified a troubled relationship in their lives that had an uncertain prognosis and were then asked to (a) “Describe the kinds of problems and difficulties you are having with this person” and (b) “Describe your thoughts and feelings regarding the possibility of this relationship continuing to go poorly or perhaps even getting worse.” Each question was presented separately on the computer screen, and participants were given 2 min for each question. Participants in the no anxious uncertainty condition identified a friend’s relationship and responded to two similar questions about their friend.

Identical and similar anxious uncertainty manipulations in the context of close relationships have specifically heightened self-reported anxious uncertainty (and not general negative affect) and ideological conviction (McGregor & Marigold, 2003, Study 3; Nash, McGregor, & Prentice, 2010, Study 1; McGregor et al., in press). For example, in one study participants completed this exact anxious uncertainty manipulation (after having first completed a relationship goal prime) and then rated the extent to which it made them feel “good,” “happy,” “smart,” “successful,” “likeable,” “meaningful,” “frustrated,” “confused,” “uncertain,” “empty,” “anxious,” “ashamed,” “insecure,” “lonely,” “stupid,” and “out of control.” The anxious uncertainty manipulation significantly heightened anxiety and uncertainty but had no significant effects on any of the other items (Nash, McGregor, & Prentice, 2010).

Approach IAT. The implicit measure of approach was the same as in Study 2. Again, IAT scores were calculated such that higher scores represented greater strength of self-approach associations.

Results

As predicted and shown in Figure 1, there was a significant interaction effect, $F(1, 62) = 3.98, p = .05$. Among participants in the ideal salience condition, those in the anxious uncertainty condition had higher approach IAT scores ($M = 155.38$) than did those in the no anxious uncertainty condition ($M = 62.56$), $t(34) = 2.29, p = .03$. In contrast, among participants in the ideal nonsa-

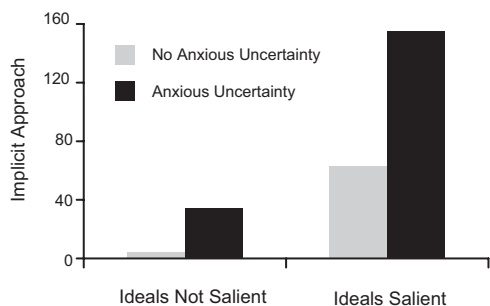


Figure 1. Effect of manipulated anxious uncertainty and ideals on implicit approach.

lience control condition, manipulated anxious uncertainty had no effect ($|t| < 1$). The other simple effects revealed that, in the anxious uncertainty condition, approach IAT scores were higher in the ideal salience condition ($M = 155.38$) than in the ideal nonsalience condition ($M = 34.59$), $t(33) = 2.32, p = .03$. In the no anxious uncertainty condition, however, there was no effect of the ideal salience manipulation ($|t| < 1$).

General Discussion

Four anxious uncertainty threats caused evidence of RAM. In Study 1, academic anxious uncertainty caused behavioral neuroscience evidence of RAM; in Study 2, the same threat (but with a different control condition) caused implicit RAM; in Study 3, an anxious uncertainty threat in the context of a relationship dilemma caused personal project RAM; in Study 4, another anxious uncertainty threat in the context of close relationships caused implicit RAM as assessed in Study 2. The convergent evidence across diverse anxious uncertainty threats and with implicit, explicit, and behavioral neuroscience measures of approach motivation provides the first comprehensive evidence for RAM.

The hypothesis that ideals mediate RAM was also supported. In Study 3, RAM in participants’ personal projects was entirely mediated by personal project idealism. In Study 4, manipulated salience of ideals enhanced the effect of the anxious uncertainty on implicit approach motivation. Together, these mediation and moderation findings with respect to the role of ideals provide promising support for a parsimonious and integrative account of diverse idealistic and ideological phenomena in the social psychological literature. They suggest that reactive idealism and ideology in the face of threat may serve to activate RAM.

Toward an Understanding of Idealistic and Ideological Defenses as RAM

Gordon Allport (1943) coined the term *fluid compensation* to refer to the curious tendency of humans to cope with thwarted drives by basking in *any* success, even with no clear relation to the threat. “Happiness, it seems, does not depend upon the satisfaction of *this* drive or *that* drive, it depends rather upon the *person* finding *some* area of success *somewhere*” (Allport, 1943, p. 466). A vast amount of empirical social psychological evidence from different research paradigms supports Allport’s claim. Indeed, fluid compensation effects appear even more fluid than Allport imagined. Various psychological threats not only motivate strivings for compensatory success toward self-worth ideals (e.g., Baumeister & Jones, 1978; Dunning & Beauregard, 2000; Tesser, Crepez, Collins, Cornell, & Beach, 2000), but they also motivate compensatory conviction, idealism, ideology, worldview defense, group identification, and the search for meaning.

There is lively debate in the literature concerning how to explain such diverse fluid compensation effects. Some theorists have invoked broad, superordinate motives such as self-integrity (Steele, 1988), meaning (Heine, Proulx, & Vohs, 2006), symbolic immortality (Greenberg, Solomon, & Pyszczynski, 1997), or security (Hart, Shaver, & Goldenberg, 2005), which varied threats undermine and diverse fluid compensation reactions are thought to bolster. Other theorists have argued for restoration of other psychological currencies, such as self-esteem (Aronson, Cohen, &

Nail, 1999), certainty (Van den Bos et al., 2005), or identity (Hogg, 2007) as the motivation for the defensive reactions. These theories are generative insofar as each continues to produce new evidence for fluid compensation effects after diverse threats. The RAM account may hold promise, however, for illuminating an integrative root process related to the basic goal regulation mechanisms described by Gray and McNaughton (2000).

Indeed, six recent goal-priming studies support the premise that RAM reactions to the anxious uncertainty manipulations in the present research are essentially reactions to goal conflict. Nash, McGregor, and Prentice (2010) found that the academic and relationship threats used in the present research aroused particularly strong RAM when preceded by domain-relevant implicit goal primes. For example, academic anxious uncertainty inductions aroused the strongest RAM when preceded by a word search puzzle with words such as *achieve*, *succeed*, and *compete*. Conversely, relational anxious uncertainty inductions aroused the strongest RAM when preceded by a word search puzzle with words such as *love*, *friend*, and *belong* (see Bargh, Gollwitzer, Chai, Barndollar, & Troetschel, 2001, for evidence that the word search puzzles prime domain-specific goals). The dependent measure of RAM in that research was the extent to which participants' personal projects were self-rated as more approach-motivated and promotion-focused than avoidance-motivated and prevention-focused.

Our basic goal-regulation-based RAM account of idealistic defense is consistent with other research showing that people with approach-motivation-related personalities are particularly inclined toward idealistic, ideological, and approach-motivated reactions to various threats. High self-esteem is significantly correlated with various approach-motivation-related dispositions, such as promotion focus, behavioral activation system drive, and action orientation (McGregor, Gailliot, Vasquez, & Nash, 2007, Study 2; see also Heimpel, Elliot, & Wood, 2006), and each of these scales similarly moderates ideological reactions to threat (McGregor et al., in press). Specifically, the catalyzing effect of dispositional self-esteem on religiously zealous reactions to anxious uncertainty threats replicated with three dispositional variables related to approach motivation in place of self-esteem (McGregor et al., in press). In all cases, as with self-esteem, threatened highs were most zealous. High self-esteem also predicts RAM-related brain activity (McGregor, Nash, & Inzlicht, 2009) and a surge in personal project approach motivation (McGregor et al., 2007, Study 3) after anxious uncertainty threats. Moreover, high self-esteem inclines people toward self-idealization and heightened value, ideological, and religious conviction after threats (Dunning & Beauregard, 2000; McGregor et al., 2007, Study 1; McGregor & Marigold, 2003; McGregor et al., 2005; McGregor et al., in press; Schmeichel et al., 2009). Other researchers have also found that among high self-esteem participants, threats to romantic relationships arouse not only relationship promotive ideals (e.g., Murray, 2005) but also a generalized risky shift and self-reported approach motivation (Cavallo, Fitzsimons, & Holmes, 2009; see Landau & Greenberg, 2006, for similar self-esteem moderation of risky reactions to mortality salience threats).

Such dispositional-approach moderation supports the RAM hypothesis but might raise the question of why such empowered individuals (i.e., high in approach motivation) would experience anxious uncertainty in the first place. The answer appears to be that

orthogonal dispositional inclinations toward vulnerability and approach motivation combine to catalyze RAM. In three experiments, low implicit self-esteem (a disposition related to experiential vulnerability; Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003; McGregor & Jordan, 2007) and high explicit self-esteem (disposition related to approach motivation; McGregor, 2006a; McGregor et al., 2007) interacted to predict ideologically defensive reactions to uncertainty-related threats (McGregor & Marigold, 2003, Study 3; McGregor et al., 2005, Study 1; Schmeichel et al., 2009, Study 3).

McGregor et al. (in press) drew a similar distinction between vulnerability to anxiety and propensity toward RAM in research showing that high uncertainty aversion (disposition related to anxious vulnerability) and high self-esteem (and other traits related to approach motivation) each predict religiously zealous reactions to threat. Thus, the most defensively reactive individuals appear to be both dispositionally vulnerable to anxious uncertainty and dispositionally approach-motivated. In some cases, high dispositional approach motivation may itself be an adaptation to experiential vulnerability, as in the case of narcissism (cf. Foster & Trimm, 2008) or hypomania (Harmon-Jones, 2003; Harmon-Jones et al., 2002). Indeed, people who report being highly sensitive to anxiety and who have the most pronounced neural aversion reactions to stressors (i.e., immediate situational deflections toward relative right-frontal cerebral hemisphericity) are particularly high in chronic relative left-frontal cerebral hemisphericity, suggesting chronic approach motivation (Heller, Nitschke, Etienne, & Miller, 1997).

Self-Affirmation and TMT

The RAM account of spontaneous idealistic reactions to threats may help inform self-affirmation and TMT research. Self-affirmation research demonstrates that idealistic affirmations (usually of participants' highest values) prevent closed-minded, hostile, partisan, and worldview defensive responses to threatening experiences and information (McGregor et al., 2001, Study 1; Schmeichel & Martens, 2005; Sherman & Cohen, 2006). From a RAM perspective, idealistic value affirmations should be expected to relieve such defensive reactions to threats because the idealistic and meaningful aspects of self-affirmations should preemptively consolidate the approach-motivated states that the defenses would have provided (Amodio et al., 2004; Carver & Harmon-Jones, 2009; Urry et al., 2004).

The RAM account may similarly help explain the related issue of why manipulated self-esteem and dispositional self-esteem differentially moderate defensive reactions to threats. As with situational manipulations of idealistic values, situational affirmations of state self-esteem tend to reduce defensively idealistic reactions to threats (Steele, 1988). In contrast, however, and as reviewed in the previous section, dispositional high self-esteem predicts the most defensively idealistic reactions to threats. This paradox may be informed by the pronounced negative skew in explicit self-esteem scores in North America (Heine, Lehman, Markus, & Kitayama, 1999), which suggest that North Americans' self-esteem may be more a reflection of identification with self-ideals than an expression of objective self-worthiness (Baumeister, Campbell, Krueger, & Vohs, 2003). Situational affirmations of self-worth, thus, likely affirm such self-worth ideals and provide the same kind of

approach-motivation-derived insulation from distress as do value-ideal affirmations. As described in the previous section, the link between dispositional high self-esteem and more pronounced idealism after threat appears to be driven by the link between dispositional self-esteem and an inclination to respond to threats with approach motivation. This interpretation is consistent with EEG research showing a relative surge in left-frontal (approach-motivation-related) brain activity after threat among individuals with high but not low explicit self-esteem (McGregor, Nash, & Inzlicht, 2009).

The RAM account may also provide a parsimonious account for results in the TMT literature. Dozens of studies have found that mortality salience heightens adherence to both idealistic sources of meaning (worldviews, romantic relationships, political and religious norms) and self-enhancement. Such findings are consistent with the TMT view that worldviews and self-esteem are twin pillars of an “anxiety buffer” against anxiety. From the present perspective, worldview and self-enhancement reactions to mortality salience would interchangeably activate the insulating effects of RAM. The RAM interpretation is thus entirely consistent with TMT research findings but may be more parsimonious, as it does not require that defensive reactions to mortality salience be interpreted as quests for symbolic immortality. The parsimony of the RAM account is particularly clear when interpreting heightened tenacity and risk-taking reactions to mortality salience, which have clear links to approach motivation (e.g., Gianotti et al., 2009) but more seemingly convoluted links to the concept of symbolic immortality (Ben-Ari, Florian, & Mikulincer, 1999; Landau & Greenberg, 2006; McGregor et al., 2007). The RAM account could economically allow for the concept of symbolic immortality to be dropped from TMT.

The RAM account may also help clarify an aspect of TMT related to self-esteem. Dozens of studies have found that people tend to strive for self-enhancement after mortality salience (reviewed in Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). These findings are consistent with the TMT view of self-esteem as part of an anxiety buffer and also with our RAM account of ideals (in this case about the self) as a way to activate RAM for insulation from distress. TMT further posits, however, that dispositional self-esteem should be associated with less worldview defense after mortality salience because people with high self-esteem should be buffered by their dispositional esteem (Pyszczynski et al., 2004). Consistent with our approach-motivation-facilitating view of high explicit self-esteem, however, the preponderance of research has indicated that high, not low, explicit self-esteem predicts more worldview defense after mortality salience (Baldwin & Wesley, 1996; McGregor et al., 2007, Study 1; Schmeichel et al., 2009; cf. Harmon-Jones et al., 1997, for a reversed pattern using an unusual measure of self-esteem). Mortality salience also causes a surge in approach-motivation-related personal projects among participants who are high but not low in explicit self-esteem (McGregor et al., 2007).³

Limitations, Future Directions, and Speculations

The present research suggests that many of the idealizing and ideological extremes of pride and conviction found in the threat and defense literature might be fruitfully understood through the lens of goal theory. Despite the promising convergent results

presented here, however, there are limitations that should be probed in future research. Perhaps foremost is the link to action. Although we demonstrate the link between RAM and goal intentions in Study 3, future research with behavioral dependent measures could help to more clearly ground the RAM account in the suggested goal regulation processes (Gray & McNaughton, 2000). After anxious uncertainty threats, the relative draw of idealistic (e.g., religious) RAM opportunities could be pitted against enticing temporal RAM opportunities (e.g., toward chocolate, gambling, pornography, or other incentives to approach).⁴

Further, given the unreliability of self-reported anxiety, in the future researchers could further highlight the role of anxiety in RAM processes in experiments with a misattribution of anxious arousal condition. The opportunity to attribute anxious arousal to a placebo would be expected to eliminate RAM. Empirical assessment of palliative RAM assumption could also be assessed with self-reported subjective salience of the eliciting anxious uncertainties (as in McGregor, 2006b) or through neural assessment of anxious reactivity in the anterior cingulate cortex (as in Inzlicht, McGregor, Hirsch, & Nash, 2009).

Future research could also further investigate conditions under which RAM serves a merely palliative function, much like displacement behaviors for other animals, or whether under some circumstances RAM may instead help restore the threatened goal or a more general goal that the threatened goal was serving (Kruglanski et al., 2002). It appears that, on the basis of the null results for domain specificity in Study 3, RAM may at least sometimes be merely palliative. Indeed, the mediation/moderation by ideals in Studies 3 and 4 suggests a general process that seems to reflect an attempt to transcend temporal conflicts rather than repair them. This palliative interpretation could provide an economical explanation for the sometimes remarkable distance between the domains of threats, reactive extremes, and antidotes in

³ In contrast, high implicit self-esteem seems to function as predicted by the dispositional self-esteem hypothesis forwarded by TMT (i.e., as an anxiety buffer that makes people less defensively reactive to mortality salience). Thus, just as is found in research with other manipulated anxious uncertainty threats, the most reactively defensive individuals are those who are dispositionally vulnerable to the experience of anxiety (e.g., those with low implicit self-esteem or high uncertainty aversion) and those who are also predisposed to approach motivation (see Schmeichel et al., 2009, for empirical evidence of differential joint moderation of mortality salience effects by implicit and explicit self-esteem; see McGregor & Marigold, 2003, and McGregor et al., 2005, for the same pattern with other anxious uncertainty threats; see McGregor et al., in press, for converging evidence of differential moderation with other dispositional measures of vulnerability and approach orientation).

⁴ A recent demonstration of the fluidity of RAM from our lab assessed specific correlates of anxious uncertainty following a prolonged strike at a major Canadian university during which students' courses were suspended (McGregor, 2010). Results indicated that anxious uncertainty was specifically correlated with undergraduate extremes of appearance, eating, partying, relationships, and special group involvement (neither negative nor positive affects, nor boredom, nor free time predicted the extremes). These results are consistent with the view that anxious uncertainty causes RAM toward whatever alternative ambient goals or ideals are salient. Future work should probe the extent to which RAM processes might help explain other forms of eager extremism in everyday life (e.g., addiction to work, fantasy, or gambling).

fluid compensation and worldview defense research (cf. Tesser's, 2000, speculation that various reactive defenses serve an implicit affect regulation function). For example, participants have been found to react to mortality salience, uncertainty, and even uncanny subliminal perceptions with an exaggerated defense of ideology (Greenberg et al., 1997; McGregor et al., 2001; Proulx & Heine, 2008). The palliative, RAM interpretation of such findings eliminates the need to posit a common psychological resource that is both undermined by the threat and restored by the defense (i.e., symbolic immortality, identity, self-integrity, or meaning). It is also consistent with other research indicating that self-transcendent ideals are often orthogonal to the temporal agentic and communal goals that characterize everyday life (Grouzet et al., 2005).

Evidence that idealistic conviction can be a form of RAM for anxiety relief comes from recent research demonstrating that religious zeal, political zeal, and approach-motivated brain activity are similarly associated with reduced reactivity in the brain region involved in anxious conflict and uncertainty detection—the anterior cingulate cortex (Amodio, Jost, Master, & Yee, 2007; Inzlicht et al., 2009; Nash, McGregor, & Inzlicht, 2010). Such findings are consistent with a basic anxiolytic function of ideology and approach motivation. Together with the present findings they suggest that reactive ideological extremes might be understood as akin to other animals' more concrete displacement compulsions in the face of anxiety.

It is interesting to speculate that the RAM process we have identified may also help explain the self-idealizing extremes of (a) narcissism, which have long been theoretically associated with uncertainty and conflict in the self-concept (Kernberg, 1975; Morf & Rhodewalt, 2001; see also Foster & Trimm, 2008, for a link between narcissism and approach motivation); (b) hypomania, which may reflect exaggerated approach motivation for affect control (see Harmon-Jones, 2003; Harmon-Jones et al., 2002); (c) motivated stereotyping, closed-mindedness, and prejudice (Fein & Spencer, 1997; Friedman & Forster, 2005; Landau et al., 2004; Schimel et al., 1999), which may in part reflect the impaired-perspective-taking and tunnel-vision characteristics of personally empowered, approach-motivated states (Gable & Harmon-Jones, 2008; Galinsky et al., 2006; Shira & Martin, 2005; Zarate, Sanders, & Garza, 2000); and even (d) aggressive extremes and hostile outbursts in the face of conflicts and moral contradictions (Mullen & Skitka, 2006; Tetlock, Kristel, Elson, Lerner, & Green, 2000) because anger is an approach-motivated emotion (Carver & Harmon-Jones, 2009).

If so, an understanding of RAM processes may help solve the riddle of why various experiential threats can cause both aggressive and antisocial extremes on the one hand (e.g., Baumeister, Smart, & Boden, 1996; Ben-Ari et al., 1999; DeWall, Twenge, Gitter, & Baumeister, 2009; Hirschberger & Ein-Dor, 2006; Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007) but also growth-oriented and prosocial initiatives on the other (e.g., Jonas, Schimel, Greenberg, & Pyszczynski, 2002; Landau, Greenberg, Sullivan, Routledge, & Arndt, 2009; Maner, DeWall, Schaller, & Baumeister, 2009; McGregor et al., 2001; Routledge & Arndt, 2009). Anxious uncertainty will motivate eager engagement with whatever opportunities for RAM are salient (cf. Gailliot, Stillman, Schmeichel, Maner, & Plant, 2008; Jonas et al., 2008; Lykins, Segerstrom, Averill, Evans, & Kemeny, 2007; Rothschild, Abdollahi, & Pyszczynski, 2009).

References

- Adorno, T. W., Frenkel-Brunswik, E., Levinson, D. J., & Sanford, R. N. (1950). *The authoritarian personality*. New York, NY: Harper.
- Allport, G. W. (1943). The ego in contemporary psychology. *Psychological Review*, *50*, 451–578.
- Amodio, D. M., Jost, J. T., Master, S. L., & Yee, C. M. (2007). Neurocognitive correlates of liberalism and conservatism. *Nature Neuroscience*, *10*, 1246–1247.
- Amodio, D. M., Shah, J. Y., Sigelman, H., Brazy, P. C., & Harmon-Jones, E. (2004). Implicit regulatory focus associated with asymmetrical frontal cortical activity. *Journal of Experimental Social Psychology*, *40*, 225–232.
- Ansbacher, H. L., & Ansbacher, R. R. (1956). *The individual psychology of Alfred Adler*. New York, NY: Basic Books.
- Antelman, S. M., Szechtman, H., Chin, P., & Fisher, A. E. (1975). Tail pinch-induced eating, gnawing and licking behavior in rats: Dependence on the nigrostriatal dopamine system. *Brain Research*, *99*, 319–337.
- Aronson, J., Cohen, G. L., & Nail, P. R. (1999). Self-affirmation theory: An update and appraisal. In E. Harmon-Jones & J. Mills (Eds.), *Cognitive dissonance: Progress on a pivotal theory in social psychology* (pp. 127–148). Washington, DC: American Psychological Association.
- Baldwin, M. W., & Wesley, R. (1996). Effects of existential anxiety and self-esteem on the perception of others. *Basic and Applied Social Psychology*, *18*, 75–95.
- Bargh, J. A., Gollwitzer, P. M., Chai, A. L., Barndollar, K., & Troetschel, R. (2001). The automated will: Nonconscious activation and pursuit of behavioral goals. *Journal of Personality and Social Psychology*, *81*, 1014–1027.
- Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2003). Does high self-esteem cause better performance, interpersonal success, happiness, or healthier lifestyles? *Psychological Science in the Public Interest*, *4*, 1–44.
- Baumeister, R. F., & Jones, E. E. (1978). When self-presentation is constrained by the target's knowledge: Consistency and compensation. *Journal of Personality and Social Psychology*, *36*, 608–618.
- Baumeister, R. F., Smart, L., & Boden, J. M. (1996). Relation of threatened egotism to violence and aggression: The dark side of high self-esteem. *Psychological Review*, *103*, 5–33.
- Ben-Ari, O. T., Florian, V., & Mikulincer, M. (1999). The impact of mortality salience on reckless driving: A test of terror management mechanisms. *Journal of Personality and Social Psychology*, *76*, 35–45.
- Berridge, C. W., Mitton, E., Clark, W., & Roth, R. H. (1999). Engagement in a non-escape (displacement) behavior elicits a selective and lateralized suppression of frontal cortical dopaminergic utilization in stress. *Synapse*, *32*, 187–197.
- Cantor, N., Norem, J. K., Niedenthal, P. M., Langston, C. A., & Brower, A. M. (1987). Life tasks, self-concept ideals, and cognitive strategies in a life transition. *Journal of Personality and Social Psychology*, *53*, 1178–1191.
- Carver, C. S., & Harmon-Jones, E. (2009). Anger is an approach-related affect: Evidence and implications. *Psychological Bulletin*, *135*, 183–204.
- Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. New York, NY: Cambridge University Press.
- Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS Scales. *Journal of Personality and Social Psychology*, *67*, 319–333.
- Cavallo, J. V., Fitzsimons, G. M., & Holmes, J. G. (2009). Taking chances in the face of threat: Romantic risk regulation and approach motivation. *Personality and Social Psychology Bulletin*, *35*, 737–751.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, *24*, 385–396.
- Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability

- independent of psychopathology. *Journal of Consulting Psychology*, 24, 349–354.
- Crumbaugh, J. C., & Maholick, L. T. (1964). An experimental study in existentialism: The psychometric approach to Frankl's concept of noogenic neurosis. *Journal of Clinical Psychology*, 20, 200–207.
- Csikszentmihályi, M. (1990). *Flow: The psychology of optimal experience*. New York, NY: Harper Row.
- Devos, T., & Banaji, M. R. (2005). American = white? *Journal of Personality and Social Psychology*, 88, 447–466.
- DeWall, C. N., Twenge, J. M., Gitter, S. A., & Baumeister, R. F. (2009). It's the thought that counts: The role of hostile cognition in shaping aggressive responses to social exclusion. *Journal of Personality and Social Psychology*, 96, 45–59.
- Dollard, J., Dobb, L. W., Miller, N. E., Mowrer, O. H., & Sears, R. R. (1939). *Frustration and aggression*. New Haven, CT: Yale University Press.
- Drake, R. A., & Myers, L. R. (2006). Visual attention, emotion, and action tendency: Feeling active or passive. *Cognition & Emotion*, 20, 608–622.
- Dunning, D., & Beauregard, K. S. (2000). Regulating impressions of others to affirm images of the self. *Social Cognition*, 18, 198–222.
- Elliot, A. J. (2008). *Handbook of approach and avoidance motivation*. Hillsdale, NJ: Erlbaum.
- Fein, S., & Spencer, S. J. (1997). Prejudice as self-image maintenance: Affirming the self through derogating others. *Journal of Personality and Social Psychology*, 73, 31–44.
- Fenichel, O. (1945). *The psychoanalytic theory of neurosis*. New York, NY: Norton.
- Foster, J. D., & Trimm, R. F. (2008). On being eager and uninhibited: Narcissism and approach-avoidance motivation. *Personality and Social Psychological Bulletin*, 34, 1004–1017.
- Friedman, R. S., & Forster, J. (2005). Effects of motivational cues on perceptual asymmetry: Implications for creativity and analytical problem solving. *Journal of Personality and Social Psychology*, 88, 263–275.
- Fromm, E. (1941). *Escape from freedom*. New York, NY: Holt, Rinehart, & Winston.
- Gable, P. A., & Harmon-Jones, E. (2008). Approach-motivated positive affect reduces breadth of attention. *Psychological Science*, 19, 476–482.
- Gailliot, M. T., Stillman, T. F., Schmeichel, B. J., Maner, J. K., & Plant, A. (2008). Mortality salience increases adherence to salient norms and values. *Personality and Social Psychology Bulletin*, 34, 993–1003.
- Galinsky, A. D., Magee, J. C., Inesi, M. E., & Gruenfeld, D. H. (2006). Power and perspectives not taken. *Psychological Science*, 17, 1068–1074.
- Gianotti, L. R. R., Knoch, D., Faber, P. L., Lehmann, D., Pascual-Marqui, R. D., Diezi, C., . . . Fehr, E. (2009). Tonic activity level in the right prefrontal cortex predicts individuals' risk taking. *Psychological Science*, 20, 33–38.
- Gray, J. A., & McNaughton, N. (2000). *The neuropsychology of anxiety: An enquiry into the functions of the septo-hippocampal system*. New York, NY: Oxford University Press.
- Greenberg, J., Martens, A., Jonas, E., Eisenstadt, D., Pyszczynski, T., & Solomon, S. (2003). Psychological defense in anticipation of anxiety: Eliminating the potential for anxiety eliminates the effect of mortality salience on worldview defense. *Psychological Science*, 14, 516–519.
- Greenberg, J., Solomon, S., & Pyszczynski, T. (1997). Terror management theory of self-esteem and cultural worldviews: Empirical assessments and conceptual refinements. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 61–139). Hillsdale, NJ: Academic Press.
- Greenwald, A. G., & Farnham, S. D. (2000). Using the implicit association test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology*, 79, 1022–1038.
- Greenwald, A. G., Pickrell, J. E., & Farnham, S. D. (2002). Implicit partisanship: Taking sides for no reason. *Journal of Personality and Social Psychology*, 83, 367–379.
- Grouzet, F. M. E., Kasser, T., Ahuvia, A., Dols, J. M. F., Kim, Y., Lau, S., . . . Sheldon, K. M. (2005). The structure of goal contents across 15 cultures. *Journal of Personality and Social Psychology*, 89, 800–816.
- Guinote, A. (2007). Power affects basic cognition: Increased attentional inhibition and flexibility. *Journal of Experimental Social Psychology*, 43, 685–697.
- Harmon-Jones, E. (2003). Clarifying the emotive functions of asymmetrical frontal cortical activity. *Psychophysiology*, 40, 838–848.
- Harmon-Jones, E., Abramson, L. Y., Sigelman, J., Bohlig, A., Hogan, M. E., & Harmon-Jones, C. (2002). Proneness to hypomania/mania or depression and asymmetrical frontal cortical responses to an anger-evoking event. *Journal of Personality and Social Psychology*, 82, 610–618.
- Harmon-Jones, E., & Gable, P. (2009). Neural activity underlying the effect of approach-motivated positive affect on narrowed attention. *Psychological Science*, 20, 406–409.
- Harmon-Jones, E., & Harmon-Jones, C. (2002). Testing the action-based model of cognitive dissonance: The effect of action orientation on post-decisional attitudes. *Personality and Social Psychology Bulletin*, 28, 711–723.
- Harmon-Jones, E., Harmon-Jones, C., Fearn, M., Sigelman, J. D., & Johnson, P. (2008). Left frontal cortical activation and spreading of alternatives: Tests of the action-based model of dissonance. *Journal of Personality and Social Psychology*, 94, 1–15.
- Harmon-Jones, E., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., & McGregor, H. (1997). Terror management theory and self-esteem: Evidence that increased self-esteem reduces mortality salience effects. *Journal of Personality and Social Psychology*, 72, 24–36.
- Hart, J., Shaver, P. R., & Goldenberg, J. L. (2005). Attachment, self-esteem, worldviews, and terror management: Evidence for a tripartite security system. *Journal of Personality and Social Psychology*, 88, 999–1013.
- Heimpel, S. A., Elliot, A. J., & Wood, J. V. (2006). Basic personality dispositions, self-esteem, and personal goals: An approach-avoidance analysis. *Journal of Personality*, 74, 1293–1319.
- Heine, S. J., Lehman, D. R., Markus, H. R., & Kitayama, S. (1999). Is there a universal need for positive self-regard? *Psychological Review*, 106, 766–794.
- Heine, S. J., Proulx, T., & Vohs, K. D. (2006). The meaning maintenance model: On the coherence of social motivations. *Personality and Social Psychology Review*, 10, 88–110.
- Heller, W., Nitschke, J. B., Etienne, M. A., & Miller, G. A. (1997). Patterns of regional brain activity differentiate types of anxiety. *Journal of Abnormal Psychology*, 106, 376–385.
- Higgins, E. T. (1996). The "Self Digest": Self-knowledge serving self-regulatory functions. *Journal of Personality and Social Psychology*, 71, 1062–1083.
- Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist*, 52, 1280–1300.
- Higgins, E. T., Roney, C., Crowe, E., & Hymes, C. (1994). Ideal versus ought predilections for approach and avoidance: Distinct self-regulatory systems. *Journal of Personality and Social Psychology*, 66, 276–286.
- Hirschberger, G., & Ein-Dor, T. (2006). Defenders of a lost cause: Terror management and violent resistance to the disengagement plan. *Personality and Social Psychology Bulletin*, 32, 761–769.
- Hogg, M. A. (2007). Uncertainty-identity theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 39, pp. 69–126). San Diego, CA: Erlbaum.
- Horney, K. (1950). *Neurosis and human growth: The struggle toward self-realization*. New York, NY: Norton.
- Inzlicht, M., McGregor, I., Hirsch, J., & Nash, K. A. (2009). Neural markers of religious conviction. *Psychological Science*, 20, 385–392.

- Jackson, D. C., Mueller, C. J., Dolski, I., Dalton, K. M., Nitschke, J. B., Urry, H. L., . . . Davidson, R. J. (2003). Now you feel it, now you don't: Frontal brain electrical asymmetry and individual differences in emotion regulation. *Psychological Science, 14*, 612–616.
- Janis, I. L. (1958). *Psychological stress*. New York, NY: Wiley.
- Jewell, G., & McCourt, M. E. (2000). Pseudoneglect: A review and meta-analysis of performance factors in line bisection tasks. *Neuropsychologia, 38*, 93–110.
- Jonas, E., Martens, A., Kayser, D. N., Fritsche, I., Sullivan, D., & Greenberg, J. (2008). Focus theory of normative conduct and terror-management theory: The interactive impact of mortality salience and norm salience on social judgment. *Journal of Personality and Social Psychology, 95*, 1239–1251.
- Jonas, E., Schimel, J., Greenberg, J., & Pyszczynski, T. (2002). The scrooge effect: Evidence that mortality salience increases prosocial attitudes and behavior. *Personality and Social Psychology Bulletin, 28*, 1342–1353.
- Jordan, C. H., Spencer, S. J., Zanna, M. P., Hoshino-Browne, E., & Correll, J. (2003). Secure and defensive high self-esteem. *Journal of Personality and Social Psychology, 85*, 969–978.
- Jost, J. T., Glaser, J., Gerslender, A. W., & Sulloway, F. J. (2003). Political conservatism as motivated social cognition. *Psychological Bulletin, 129*, 339–375.
- Kawakami, K., Steele, J. R., Cifa, C., Phills, C. E., & Dovidio, J. F. (2008). Approaching math increases math = me, math = pleasant. *Journal of Experimental Social Psychology, 44*, 818–825.
- Kay, A. C., Moscovitch, D. M., & Laurin, K. (2010). Randomness, attributions of arousal, and belief in God. *Psychological Science, 21*, 216–218.
- Keltner, D., Gruenfeld, D. H., & Anderson, C. (2003). Power, approach, and inhibition. *Psychological Review, 110*, 265–284.
- Kernberg, O. (1975). *Borderline conditions and pathological narcissism*. New York, NY: Jason Aronson.
- Klinger, E. (1975). Consequences of commitment to and disengagement from incentives. *Psychological Review, 82*, 1–25.
- Klinger, E. (1977). *Meaning and void: Inner experience and the incentives in people's lives*. Minneapolis: University of Minnesota Press.
- Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, R., Chun, W. Y., & Sleeth-Keppler, D. (2002). A theory of goal systems. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 34, pp. 331–378). San Diego, CA: Academic Press.
- Kuhl, J. (1994). Action and state orientation: Psychometric properties of the action control scales (ACS-90). In J. Kuhl & J. Beckmann (Eds.), *Volition and personality: Action versus state orientation* (pp. 47–59). Göttingen, Germany: Hogrefe & Huber.
- Landau, M. J., & Greenberg, J. (2006). Play it safe or go for the gold? A terror management perspective on self-enhancing and self-protective motives in risky decision-making. *Personality and Social Psychology Bulletin, 32*, 1633–1645.
- Landau, M. J., Greenberg, J., & Sullivan, D. (2009). Defending a coherent autobiography: When past events appear incoherent, mortality salience prompts compensatory bolstering of the past's significance and the future's orderliness. *Personality and Social Psychology Bulletin, 35*, 1012–1020.
- Landau, M. J., Greenberg, J., Sullivan, D., Routledge, C., & Arndt, J. (2009). The protective identity: Evidence that mortality salience heightens the clarity and coherence of the self-concept. *Journal of Experimental Social Psychology, 45*, 796–807.
- Landau, M. J., Johns, M., Greenberg, J., Pyszczynski, T., Martens, A., Goldenberg, J. L., & Solomon, S. (2004). A function of form: Terror management and structuring the social world. *Journal of Personality and Social Psychology, 87*, 190–210.
- Lewin, K. (1935). *A dynamic theory of personality* (D. K. Adams & K. E. Zaner, Trans.). New York, NY: McGraw-Hill.
- Little, B. R. (1983). Personal projects: A rationale and method for investigation. *Environment and Behavior, 15*, 273–309.
- Little, B. R. (1993). Personal projects and the distributed self: Aspects of a conative psychology. In J. Suls (Ed.), *Psychological perspectives on the self: The self in social perspective* (Vol. 4, pp. 157–185). Hillsdale, NJ: Erlbaum.
- Little, B. R., Salmela-Aro, K., & Phillips, S. D. (2007). *Personal project pursuit: Goals, action, and human flourishing*. Mahwah, NJ: Erlbaum.
- Lockwood, P., Jordan, C., & Kunda, Z. (2002). Motivation by positive or negative role models: Regulatory focus determines who will best inspire us. *Journal of Personality and Social Psychology, 83*, 854–864.
- Lykins, E. L. B., Segerstrom, S. C., Averill, A. J., Evans, D. R., & Kemeny, M. E. (2007). Goal shifts following reminders of mortality: Reconciling posttraumatic growth and terror management theory. *Personality and Social Psychology Bulletin, 33*, 1088–1099.
- Maner, J. K., DeWall, C. N., Schaller, M., & Baumeister, R. F. (2009). Does social exclusion motivate interpersonal reconnection? Resolving the “porcupine problem.” *Journal of Personality and Social Psychology, 92*, 42–55.
- McCourt, M. E., Freeman, P., Tahmahkera-Stevens, C., & Chausee, C. (2001). The influence of unimanual response on pseudoneglect magnitude. *Brain and Cognition, 45*, 52–63.
- McGregor, I. (2006a). Offensive defensiveness: Toward an integrative neuroscience of compensatory zeal after mortality salience, personal uncertainty, and other poignant self-threats. *Psychological Inquiry, 17*, 299–308.
- McGregor, I. (2006b). Zeal appeal: The allure of moral extremes. *Basic and Applied Social Psychology, 28*, 343–348.
- McGregor, I. (2010). *Uncertain roots of opinion and lifestyle extremes*. Unpublished manuscript, York University, Toronto, Ontario, Canada.
- McGregor, I., Gailliot, M. T., Vasquez, N., & Nash, K. A. (2007). Ideological and personal zeal reactions to threat among people with high self-esteem: Motivated promotion focus. *Personality and Social Psychology Bulletin, 33*, 1587–1599.
- McGregor, I., Haji, R., & Kang, S.-J. (2008). Can ingroup affirmation relieve outgroup derogation? *Journal of Experimental Social Psychology, 44*, 1395–1401.
- McGregor, I., Haji, R., Nash, K. A., & Teper, R. (2008). Religious zeal and the uncertain self. *Basic and Applied Social Psychology, 30*, 183–188.
- McGregor, I., & Jordan, C. H. (2007). The mask of zeal: Low implicit self-esteem, and defensive extremism after self-threat. *Self and Identity, 6*, 223–237.
- McGregor, I., & Little, B. R. (1998). Personal projects, happiness, and meaning: On doing well and being yourself. *Journal of Personality and Social Psychology, 74*, 494–512.
- McGregor, I., & Marigold, D. C. (2003). Defensive zeal and the uncertain self: What makes you so sure? *Journal of Personality and Social Psychology, 85*, 838–852.
- McGregor, I., Nail, P. R., Marigold, D. C., & Kang, S.-J. (2005). Defensive pride and consensus: Strength in imaginary numbers. *Journal of Personality and Social Psychology, 89*, 978–996.
- McGregor, I., Nash, K. A., & Inzlicht, M. (2009). Threat, high self-esteem, and reactive approach motivation: Electroencephalographic evidence. *Journal of Experimental Social Psychology, 45*, 1003–1007.
- McGregor, I., Nash, K. A., & Prentice, M. (in press). Reactive approach motivation (RAM) for religion. *Journal of Personality and Social Psychology*.
- McGregor, I., Prentice, M., & Nash, K. A. (2009). Personal uncertainty management by reactive approach motivation. *Psychological Inquiry, 20*, 225–229.
- McGregor, I., Zanna, M. P., Holmes, J. G., & Spencer, S. J. (2001). Compensatory conviction in the face of personal uncertainty: Going to extremes and being oneself. *Journal of Personality and Social Psychology, 80*, 472–488.

- Morf, C. C., & Rhodewalt, F. (2001). Unraveling the paradoxes of narcissism: A dynamic self-regulatory processing model. *Psychological Inquiry, 12*, 177–196.
- Mullen, E., & Skitka, L. J. (2006). Exploring the psychological underpinnings of the moral mandate effect: Motivated reasoning, group differentiation, or anger? *Journal of Personality and Social Psychology, 90*, 629–643.
- Murray, S. (2005). Regulating the risks of closeness: A relationship-specific sense of felt security. *Current Directions in Psychological Science, 14*, 74–78.
- Nash, K. A., McGregor, I., & Inzlicht, M. (2010). *Approach motivated neural activity predicts muted anterior cingulate cortex reactivity*. Unpublished manuscript, York University, Toronto, Ontario, Canada.
- Nash, K. A., McGregor, I., & Inzlicht, M. (in press). Line bisection as a neural measure of approach motivation. *Psychophysiology*.
- Nash, K. A., McGregor, I., & Prentice, M. (2010). *Threat and defense: Implicit goal conflict and reactive approach motivation (RAM)*. Unpublished manuscript, York University, Toronto, Ontario, Canada.
- Newby-Clark, I. R., McGregor, I., & Zanna, M. P. (2002). Thinking and caring about cognitive inconsistency: When and for whom does attitudinal ambivalence feel uncomfortable? *Journal of Personality and Social Psychology, 82*, 157–166.
- Nosek, B. A., Banaji, M. R., & Greenwald, A. G. (2002). Math = male, me = female, therefore math ≠ me. *Journal of Personality and Social Psychology, 83*, 44–59.
- Palys, T. S., & Little, B. R. (1983). Perceived life satisfaction and the organization of personal project systems. *Journal of Personality and Social Psychology, 44*, 1221–1230.
- Pedhazur, E. J. (1982). *Multiple regression in behavioral research: Explanation and prediction* (2nd ed.). Fort Worth, TX: Holt, Rinehart & Winston.
- Peterson, J. B. (1999). *Maps of meaning*. New York, NY: Routledge.
- Pinter, B., & Greenwald, A. G. (2004). Understanding implicit partisanship: Enigmatic (but genuine) group identification and attraction. *Group Processes and Interpersonal Relations, 7*, 283–296.
- Powers, W. T. (1973). *Behavior: The control of perception*. Chicago, IL: Aldine.
- Proulx, T., & Heine, S. J. (2008). The case of the transmogrifying experimenter: Affirmation of a moral schema following implicit change detection. *Psychological Science, 19*, 1294–1300.
- Pyszczynski, T., Greenberg, J., & Solomon, S. (1999). A dual-process model of defense against conscious and unconscious death-related thoughts: An extension of terror management theory. *Psychological Review, 106*, 835–845.
- Pyszczynski, T., Greenberg, J., Solomon, S., Arndt, J., & Schimel, J. (2004). Why do people need self-esteem? A theoretical and empirical review. *Psychological Bulletin, 130*, 435–468.
- Rappaport, J. L., Ryland, D. H., & Kriete, M. (1992). Drug treatment of canine acral lick: An animal model of obsessive-compulsive disorder. *Archives of General Psychiatry, 49*, 517–521.
- Raskin, R. N., & Hall, C. S. (1979). A narcissistic personality inventory. *Psychological Reports, 45*, 590.
- Rogers, T. B., Kuiper, N. A., & Kirker, W. S. (1977). Self-reference and the encoding of personal information. *Journal of Personality and Social Psychology, 35*, 677–688.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Rothschild, Z. K., Abdollahi, A., & Pyszczynski, T. (2009). Does peace have a prayer? The effect of mortality salience, compassionate values, and religious fundamentalism on hostility toward out-groups. *Journal of Experimental Social Psychology, 45*, 816–827.
- Routledge, C. D., & Arndt, J. (2009). Creative terror management: Creativity as a facilitator of cultural exploration after mortality salience. *Personality and Social Psychology Bulletin, 35*, 493–505.
- Routtenberg, A., & Kuznesof, A. W. (1967). Self-starvation of rats living in activity wheels on restricted feeding schedule. *Journal of Comparative and Physiological Psychology, 64*, 414–421.
- Rudman, L. A., Ashmore, R. D., & Gary, M. L. (2001). “Unlearning” automatic biases: The malleability of implicit prejudice and stereotypes. *Journal of Personality and Social Psychology, 81*, 856–868.
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*, 1069–1081.
- Schimel, J., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., Waxmonsky, J., & Arndt, J. (1999). Stereotypes and terror management: Evidence that mortality salience enhances stereotypic thinking and preferences. *Journal of Personality and Social Psychology, 77*, 905–926.
- Schmeichel, B. J., Gailliot, M. T., Filardo, E.-A., McGregor, I., Gitter, S., & Baumeister, R. F. (2009). Terror management theory and self-esteem revisited: The roles of implicit and explicit self-esteem in mortality salience effects. *Journal of Personality and Social Psychology, 96*, 1077–1087.
- Schmeichel, B., & Martens, A. (2005). Self-affirmation and mortality salience: Affirming values reduces worldview defense and death-thought accessibility. *Personality and Social Psychology Bulletin, 31*, 658–667.
- Shah, J. Y., Friedman, R., & Kruglanski, A. W. (2002). Forgetting all else: On the antecedents and consequences of goal shielding. *Journal of Personality and Social Psychology, 83*, 1261–1280.
- Sherman, D. K., & Cohen, G. L. (2006). The psychology of self-defense: Self-affirmation theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 38, pp. 183–242). San Diego, CA: Academic Press.
- Shrira, I., & Martin, L. L. (2005). Stereotyping, self-affirmation, and the cerebral hemispheres. *Personality and Social Psychology Bulletin, 31*, 846–856.
- Solomon, S., Greenberg, J., & Pyszczynski, T. (2004). The cultural animal: Twenty years of terror management theory and research. In J. Greenberg, S. Koole, & T. Pyszczynski (Eds.), *Handbook of experimental existential psychology* (pp. 13–34). New York, NY: Guilford Press.
- Sorrentino, R. M., & Roney, C. R. J. (2000). *The uncertain mind: Individual differences in facing the unknown*. Philadelphia, PA: Psychology Press.
- Spencer, S. J., Zanna, M. P., & Fong, G. T. (2005). Establishing a causal chain: Why experiments are often more effective than mediational analyses in examining psychological processes. *Journal of Personality and Social Psychology, 89*, 845–851.
- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (pp. 261–302). Orlando, FL: Academic Press.
- Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The Meaning in Life Questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology, 53*, 80–93.
- Taylor, S. E., & Gollwitzer, P. M. (1995). Effects of mindset on positive illusions. *Journal of Personality and Social Psychology, 69*, 213–226.
- Tesser, A. (2000). On the confluence of self-esteem maintenance mechanisms. *Personality and Social Psychology Review, 4*, 290–299.
- Tesser, A., Crepez, N., Collins, J. C., Cornell, D., & Beach, S. R. H. (2000). Confluence of self-esteem regulation mechanisms: On integrating the self-zoo. *Personality and Social Psychology Bulletin, 26*, 1476–1489.
- Tetlock, P. E., Kristel, O. V., Elson, S. B., Lerner, J. S., & Green, M. C. (2000). The psychology of the unthinkable: Taboo trade-offs, forbidden base rates, and heretical counterfactuals. *Journal of Personality and Social Psychology, 78*, 853–870.
- Twenge, J. M., Baumeister, R. F., DeWall, C. N., Ciarocco, N. J., & Bartels, M. J. (2007). Social exclusion decreases prosocial behavior. *Journal of Personality and Social Psychology, 92*, 56–66.

REACTIVE APPROACH MOTIVATION

- Uchiumi, K., Aoki, M., Kikusui, T., Takeuchi, Y., & Mori, Y. (2008). Wheel-running activity increases with social stress in male DBA mice. *Physiology and Behavior, 93*, 1–7.
- Urry, H. L., Nitschke, J. B., Dolski, I., Jackson, D. C., Dalton, K. M., Mueller, C. J., . . . Davidson, R. J. (2004). Making a life worth living: Neural correlates of well-being. *Psychological Science, 15*, 367–372.
- Van den Bos, K. (2009). Making sense of life: The existential self trying to deal with personal uncertainty. *Psychological Inquiry, 20*, 197–217.
- Van den Bos, K., Poortvliet, P. M., Maas, M., Miedema, J., & Van den Ham, E.-J. (2005). An enquiry concerning the principles of cultural norms and values: The impact of uncertainty and mortality salience on reactions to violations and bolstering of cultural worldviews. *Journal of Experimental Social Psychology, 41*, 91–113.
- White, S. D. (1990). Naltrexone for treatment of acral lick dermatitis in dogs. *Journal of the American Veterinary Medical Association, 196*, 1073–1076.
- Wichman, A. L., Brunner, R. P., & Weary, G. (2008). Immediate and delayed effects of causal uncertainty inductions on uncertainty accessibility. *Journal of Experimental Social Psychology, 44*, 1106–1113.
- Wilson, T. D., Centerbar, D. B., Kermer, D. A., & Gilbert, D. T. (2005). The pleasures of uncertainty: Prolonging positive moods in ways people do not anticipate. *Journal of Personality and Social Psychology, 88*, 5–21.
- Zanna, M. P., & Cooper, J. (1974). Dissonance and the pill: An attribution approach to studying the arousal properties of dissonance. *Journal of Personality and Social Psychology, 29*, 703–709.
- Zarate, M. A., Sanders, J. D., & Garza, A. A. (2000). Neurological disassociations of social perception processes. *Social Cognition, 18*, 223–225.