

Anxiety and Intergroup Bias: Terror Management or Coalitional Psychology?

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Contemplation of death increases support of ingroup ideologies, a result explained by proponents of terror management theory (TMT) as an attempt to buffer existential anxiety. While TMT claims that only death-salient stimuli yield such effects, an evolutionary perspective suggests that increased intergroup bias may occur in response to a wide variety of situations that, in ancestral environments, posed adaptive problems for which marshaling social support was a reliably adaptive response. Four experiments from two cultures produced results consistent with this latter perspective but contrary to TMT. Studies 1 and 2 demonstrated that, among UCLA undergraduates, participants asked to contemplate aversive scenarios unrelated to death displayed increased support of ingroup ideology. Studies 3 and 4 replicated elements of these results, exploring the moderating effects of self-esteem and collectivism on intergroup bias in two Costa Rican samples. These results indicate that worldview defense effects occur even when death is not salient.

KEYWORDS authoritarianism, evolutionary psychology, ideology, ingroup, interdependence, outgroup, self-esteem, terror management

TERROR management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986; Greenberg, Solomon, & Pyszczynski, 1997) seeks to explain the well-known tendency for people to defend their deeply held beliefs and ideological commitments (e.g. Festinger, 1957; Lerner, 1980). Although it owes a scholarly debt to a wide variety of influences (Freud, 1929/1984; Kierkegaard, 1844/1959; Rank, 1936), TMT was largely inspired by anthropologist Ernst Becker's integrative efforts at explaining why

people possess ethnocentric constructions of reality, and why they apparently need to have faith in them. Becker (1962, 1973) proposed that the unique human capacities for symbolic

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and self-reflective thought were adaptive because they enhanced the ability to survive and thrive in a wide variety of physical and social environments. However, these capacities also gave rise to the potential for paralyzing anxiety, as humans became aware that the inevitable outcome of all human striving was death. According to Becker, the knowledge of the inevitability of death for organisms oriented towards self-preservation created the potential for a chronic condition of debilitating anxiety—an adaptive problem our species needed to overcome.

Following Becker, terror management theorists claim that a key function of cultural worldviews is to manage the fear of death. Faith in a worldview is said to be important in assuaging death terror as worldviews are thought to provide a sense of real or symbolic immortality—real in the sense that they provide promises of a life to come; symbolic in the sense that they provide a system of meaning and stability that is larger than the individual and persists after the individual's death. According to this view, ethnocentrism is in large part caused by the defensive reaction to outgroup ideologies. Merely knowing that dissimilar others hold values and beliefs different from those of the established ingroup challenges the validity of the individual's culturally constructed worldview, thus exposing the individual to death anxiety. Because this is unsettling, TMT theorists argue, individuals are motivated to buffer themselves from this anxiety by bolstering their faith in their own worldview. This is done by affirming one's core beliefs, derogating outgroups, and, in extreme cases, aggressing against or annihilating those who do not share one's views (McGregor et al., 1998).

TMT advocates claim that, because the individual's worldview provides protection against death concerns, reminding individuals of the prospect of their own corporeal death should increase the need for this cultural buffer (Greenberg et al., 1986). TMT researchers have shown that participants in experiments asked to contemplate their own deaths exhibit increases in positive evaluations of people whose attitudes and values are similar to their own and derogation of others with dissimilar views. TMT

theorists claim that these changes reflect an attempt by participants to defend their cultural worldviews in order to buffer themselves from the fear of death. Mortality-salience induction has been shown to lead to harsher evaluations of members of the outgroup (Harmon-Jones, Greenberg, Solomon, & Simon, 1996), moral transgressors, and attitudinally dissimilar others (Greenberg et al., 1990). Likewise mortality-salience induction demonstrably elicits positive evaluative biases towards those who bolster ingroup ideology (see Greenberg et al., 1997 for a review) and more positive evaluations of those who uphold moral standards (Rosenblatt et al., 1989) or who are attitudinally similar (Greenberg et al., 1990).

Terror management advocates claim that these 'mortality-salience effects' are not explicable as effects emerging from generalized value accessibility, negative affect, or worrisome thoughts (Greenberg et al., 1995) and explicitly argue that their experimental results are caused specifically by the salience of death concerns (Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997; Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994). In a recent article, after reviewing mortality-salience research, three of the principal architects of TMT unambiguously state that

unique support for [TMT] from the studies reported above is predicated on the assumption that mortality salience effects are engendered specifically by concerns about one's own mortality rather than in response to any anxiety-provoking or self-threatening event. We believe that a very strong case can now be made that mortality salience effects are indeed uniquely driven by thoughts of mortality. (Greenberg et al., 1997)

Theoretical difficulties with TMT

While TMT has led to an impressive array of research, with detailed predictions being borne out by careful experimental work, there are a number of theoretical difficulties with the framework. Some of the objections we have to TMT have already been voiced by other authors (e.g. Buss, 1997; Leary & Schreindorfer, 1997), but have not been satisfactorily answered by TMT theorists. Chief among these are (1) the

problematic nature of the assumption of a 'survival instinct' on which the theory hinges, and (2) the notion of an adaptive function for anxiety reduction.

TMT proponents make reference to a 'survival instinct', a motivational system that purportedly causes all organisms to avoid their own deaths (Greenberg et al., 1997). However, there are both logical and theoretical grounds to doubt such claims. First, a generalized instinct to avoid death could only function through some sort of ability to foresee the ultimate consequences of failing to avoid hazards (i.e. 'If I fall off this cliff my body will be irreparably damaged, resulting in my demise', etc.). A 'survival instinct' thus necessitates awareness that events that have not yet occurred will bring an end to one's life. This is tantamount to an awareness of one's own mortality. How then can it be the case that, as TMT claims, all organisms possess a 'survival instinct', yet only humans can foresee their own deaths? If possessing a 'survival instinct' and being aware of one's mortality causes paralyzing anxiety that is only remedied through worldview defense, then either all organisms engage in worldview defense, or only humans possess a 'survival instinct', meaning that natural selection created in humans a novel instinct which, upon its creation, instantly generated paralyzing anxiety in those who possessed it. Both scenarios are highly implausible.

Viewed from a broader theoretical perspective, the logical difficulties inherent in the notion of a 'survival instinct' are not surprising, since contemporary evolutionary approaches specifically argue that such a general motivational system is unlikely, as natural selection can only build mechanisms designed to solve particular adaptive problems (Tooby & Cosmides, 1992). The logic of domain-specificity so important to modern evolutionary psychology argues that such mechanisms are simply too vague to result in any practical guidance of adaptive behavior (Buss, 1991; Pinker, 1997; Symons, 1992). While a problem such as *avoiding cliffs* is a task which natural selection can design cognitive mechanisms to solve (as evidenced by the *visual cliff* phenom-

enon; Gibson & Walk, 1960), *avoiding death*, per se, is not. What appears to be a single 'survival instinct' is most likely a collection of discrete mechanisms, each designed to protect the organism from particular kinds of dangers in part by generating anxiety in reaction to specific classes of proximate cues (Paulhus & Trapnell, 1997).

If anxiety is the product of adaptations that are activated under conditions of threat, then selection should strongly disfavor additional systems that inhibit anxious responses (Buss, 1997; Leary & Schreindorfer, 1997; Pelham, 1997). A person feeling anxious sitting on railway tracks as a train approaches might feel some relief by thinking warm thoughts about her worldview, but the problem of imminent annihilation still looms. One would expect that an adaptive response to the prospect of harm or death would be to engage in behavior that makes such events less likely, as opposed to merely reducing anxiety. Even if an organism for some reason came to be designed such that it was reacting with 'too much' anxiety to a particular circumstance, it is not clear why selection would not simply favor a reduction in the affective response, rather than build a separate system to compensate for this excessive anxiety. Indeed, in contrast to TMT's antiquated premise that anxiety constitutes an obstacle to effective behavior, a large and growing body of work indicates that affective systems are well designed to prompt appropriate behavior in the face of adaptive challenges likely to have confronted ancestral humans (Cosmides & Tooby, 2002; Curtis & Biran, 2001; Damasio, 1994; Fiske, 2002; Frank, 2001; Kirkpatrick, Waugh, Valencia, & Webster, 2002).

An evolutionary view of worldview defense

We submit that the mortality-salience phenomenon can be better explained by reference to a system of adaptive mechanisms that facilitate the formation of social networks, interpersonal attachments, and coalitions. In developing an alternative to TMT, we adopt an evolutionary perspective inspired in part by the

anthropologist A. I. Hallowell (1956, 1963), who argued that the internalization of cultural standards is crucial for individual adaptive coordination within groups, a notion consistent with evolutionary game-theoretic models that emphasize the adaptive utility of conformity to social norms in order to enhance the efficiency of coordination among self-interested actors engaged in mutualistic cooperation (e.g. McElreath, Boyd, & Richerson, 2003). If the internalization of norms occurs because of the social benefits of norm adherence, and if such benefits are particularly important in times of need, then natural selection can be expected to have shaped human psychology such that, when confronted with emergency situations that can be remedied through coalitional support, individuals will exhibit a strongly pro-normative orientation in order to enhance the maintenance and formation of alliances. The centrality of norm internalization in relational models of human social reasoning is consistent with a substantial body of literature in the field of social cognition (Aron, Aron, Tudor, & Nelson, 1991; Baldwin, 1992; Hardin & Higgins 1996; Leary, 2000; Schaller & Conway, 1999), and is also prevalent in the classic social psychological approaches to intergroup bias (Asch, 1952; Sherif, 1966; Sherif, Harvey, White, Hood, & Sherif, 1954).

One of the important ways in which people can create or enhance interpersonal connections is through the affirmation of a perceived achievement of mutual understanding and common values, or what some have termed a *shared reality* with relevant others (Hardin & Higgins, 1996). As beings motivated to affiliate with and be accepted by others, people tend to present themselves in ways they believe will lead others to respect and like them (Asch, 1955; Baumeister & Leary, 1995; Schaller & Conway, 1999). If individuals strategically alter the contents of their communications in response to relational goals (Hardin & Conley, 2001), then impression management motives may exert influence on their social cognitions and evaluative assessments of others (Schaller & Conway, 1999). We submit this should be particularly so in times of need, as the adaptive system that

generates the mental representations necessary to facilitate social relationships should be particularly active in threatening situations.

We theorize that, since social relationships are particularly important in times of social conflict or need (Baumeister & Leary, 1995; Tooby & Cosmides, 1996), exposure to particular types of aversive stimuli, including but not limited to those concerning death, should lead to increases in pro-normative attitudes towards one's relevant reference groups (i.e. changes which TMT theorists term *worldview defense*). Hence, whereas TMT predicts that no stimuli or arousal short of those that elicit thoughts of death will lead to the aforementioned changes in cognitive states influencing social attitudes (Arndt et al., 1997; Greenberg et al., 1995, 1997), we predict that a range of aversive stimuli should have this effect. More specifically, we predict that such eliciting stimuli will concern or index situations that (1) pose adaptive problems for individuals in their immediate environments (or, more formally, repeatedly did so in the environments in which the human mind evolved), and (2) are, or would have been, most effectively addressed using the support of allies. We suggest that, rather than being the sole and central focus of the phenomenon at issue, the contemplation of death elicits increased ideology defense primarily because the likely common causes of death in ancestral environments (dire illness, severe bodily harm, and starvation) were conditions in which successfully acquiring increased social support would have had significant fitness consequences.

TMT advocates have pointedly argued that mortality concerns are not merely a specific instance of a more general category of threatening events that could increase pro-normative sentiments (Greenberg et al., 1994, 1995), and have demonstrated that exposure to some aversive thoughts unrelated to death, such as failing an exam or being forced to engage in public speaking, do not engender the 'worldview-defense' effects elicited by mortality-salience (Greenberg et al., 1997). They have interpreted these findings as evidence supporting the notion that mortality salience effects

are 'outside the purview of other theories that might suggest that self-relevant threats would enhance intergroup bias and adherence to cultural values' (Greenberg et al., 1994). From our perspective, the non-death primes listed above should not be expected to provoke the same shifts in pro-normative cognitions since they do not evoke fitness-relevant challenges in which coalitions could conceivably be a part of an adaptive solution to the problem. Rather than speaking to the uniqueness of mortality-salience, these results simply underline the need to view contemporary experiences with an eye toward the ancestral world in which our minds are designed to operate.

Note that we are not proposing that the phenomenon to be explained consists merely of the tendency for people to produce positive evaluations of ingroup norms and negative evaluations of outgroups: The available evidence suggests that the phenomenon at issue is much more complex (i.e. Greenberg et al., 1990; Mikulincer, Florian, Birnbaum, & Malishkevich, 2002). We agree with terror management researchers that evaluations of dissimilar views may be tolerated to a greater degree under mortality-salience conditions depending on the personality and ideology of respondents (Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992). However, whereas terror management researchers view these differences as stemming from unique styles of coping with the existential dilemma consistent with the individual's worldview (Greenberg et al., 1997), we interpret these results as simply reflecting adaptive shifts in the cognition that binds social relations when individuals bolster their commitment to the ideologies of relevant ingroups. From our perspective, one's individual orientation is important in managing social life because the psychological mechanisms responsible for facilitating social relationships are mediated through a language of shared values, beliefs, and norms (Hardin & Conley, 2001), making the appropriate relational cognitions for servicing social relationships different depending on the norms of the social group with which one identifies. Thus, if one's ingroup values tolerance of diversity, then

bolstering one's commitment to that ideology in response to threat entails increasing one's overt tolerance for opposing views.

The present research

To evaluate these competing theories we used the same research paradigm employed in TMT research, with some minor changes. In addition to the mortality-salience manipulation, we created other conditions containing priming stimuli designed to induce participants to think about scenarios unrelated to death but pertaining to the need for the social assistance. Whereas TMT specifically argues that changes in the dependent measures used by terror management researchers should be observed exclusively when ideas about one's corporeal death are made salient (Greenberg et al., 1997), our coalitional psychology theory suggests that alternative routes to such effects should include contemplating fitness-relevant scenarios which speak to the need for social relationships. To test this notion, we designed primes focusing on (1) a threat to one's personal property, and (2) social isolation and separation from important social relationships. Our reason for employing the experience of theft as an experimental prime was as follows: We hypothesize that an individual's access to and control over resources was a significant determinant of fitness in ancestral environments (Manson & Wrangham, 1991). It is therefore plausible that humans have evolved a system of psychological mechanisms that give rise to the active procurement and maintenance of valued resources. Social networks and coalitions clearly aid in achieving these goals, as allies can increase access to resources, assist in guarding resources, and enact retribution on competitors who attempt to appropriate resources. We therefore predicted that psychological mechanisms that operate to enhance coalitional support should be activated by the prospect of having had one's possessions stolen, for such an event indicates an immediate increase in the need for resources, indexes inadequate social assistance in the protection of one's resources to date, and signals the need

for allies in seeking vengeance on thieves, actions that will deter future fitness-reducing transgressions.

We predicted that the prospect of complete social isolation as an experimental prime would similarly elicit the mechanisms that enhance coalitional support. An individual's access to any of the benefits of sociality, such as finding mates, protection from predators or conspecifics, access to food and shelter, etc., depends on his or her inclusion in social groups. To the extent that social networks and coalitions aid individuals in procuring these benefits, they should be motivated to take steps to achieve inclusion in relevant social groups. Consistent with our reasoning described above for the theft-salience prime, we posited that the mechanisms of the adaptive system for creating or reaffirming beneficial social bonds in times of social exclusion or marginalization should give rise to the pro-normative, ingroup-affiliative sentiments necessary to obtain needed social support.

Because we wanted to show that our aversive-thought primes activated the same psychological mechanisms as those underlying the ideology defense effects produced by mortality-salience induction, we sought to demonstrate that these effects were moderated by the same individual differences in social orientation or personality dimensions as those demonstrated in terror management research. In Study 1, we explored the moderating effects of ingroup ideology defense using the personality construct Right-wing Authoritarianism (Altemeyer, 1998) with UCLA undergraduates as participants. In Study 2, using measures employed by terror management researchers (Arndt et al., 1997), we sought to demonstrate that the effects found in our experiments were not due to an increase in death-related thoughts. In Studies 3 and 4 we replicated elements of Study 1 while exploring the moderating effects of self-esteem and interconnectedness on intergroup bias in two Costa Rican samples.

Study 1

In our first study, we sought to employ experimental conditions unrelated to death to elicit

the same type of ingroup ideology defense that terror management researchers produce using the mortality-salience prime. We used a dependent measure of ingroup ideology defense commonly employed in terror management research—a measure of bias towards American people, ideology and culture. We predicted that exposure to aversive themes unrelated to death would produce effects on the dependent measure indistinguishable from those caused by mortality-salience.

Authoritarianism and political conservatism have been shown to be moderators of bias against dissimilar others in terror management experiments (Greenberg et al., 1990, 1992). Political conservatives and high-authoritarians were found to show decreased liking for dissimilar others after contemplating death, but no such effects were found for political liberals and low-authoritarians. As noted earlier, this pattern is understandable given that increased ideological adherence should produce different reactions to dissimilar others in those identifying with intolerant versus tolerant ideologies. To demonstrate that our aversive-thought primes operate on the same mechanisms as does mortality-salience, we predicted that, for each of our primes, the attitudinal changes would be moderated by individual differences in authoritarianism, such that the slopes measuring the relationship between authoritarianism and pro-American bias would increase as a function of the experimental condition. More specifically, we predicted that the effect of the treatments on pro-American bias would be mainly found for participants scoring high on authoritarianism.

Terror management researchers report that a delay/distraction between the death prime and the measurement of worldview-defense is necessary for mortality-salience effects to occur, ostensibly because death thoughts are suppressed immediately following mortality-salience induction (Arndt et al., 1997). Similarly, terror management researchers have found no measurable differences in self-reported affect following mortality-salience primes, a pattern which they interpret in terms of processes of repression and anxiety

management (Greenberg et al., 1997). Without taking a position on these theoretical claims, because we predict that non-death-related aversive thought primes should activate the same mechanisms as those elicited by mortality-salience, we sought to replicate this null effect using our theft and social isolation primes. We therefore administered the Positive and Negative Affect Schedule, Expanded Form (PANAS-X; Watson & Clark, 1992), between the manipulation and the measurement of pro-American bias as a delay and distraction, and to test whether our experimental manipulations had caused any measurable changes in affect likely to influence the results on the dependent measure.

Although terror management research has failed to find consistent significant effects with respect to the demographic variables explored (Greenberg et al., 1997), we also investigated the effects of demographic variables on intergroup bias, namely: gender, age, and year in college. We had no *a priori* predictions about the outcome of any significant effects, but wanted to explore the effects of these variables while controlling for undue noise in the observed effects.

Method

Participants Following Greenberg, Arnat, Schimel, Pyszcznski, & Solomon (2001), only participants who were American citizens and who responded to the item 'How important to you is your identification as an American?', with a rating higher than 5 on a 9-point scale on a pretest questionnaire were recruited for the study. This was done to increase the effectiveness of our dependent measure of pro-American bias by eliminating those for whom the US was not viewed as a relevant ingroup. Participants were undergraduate students at the University of California, Los Angeles. Students participated voluntarily for a payment of \$4.00, completing a packet of questionnaires presented as an anonymous survey investigating personality and social attitudes. After dropping five participants before the analysis because of a failure to complete all items on the questionnaires, we were left with 73 women and 36 men ranging in age from 18 to 34 (Mean Age = 20.4).¹

Procedure Participants were instructed to complete the questionnaires at their own pace, taking care to complete them in the order in which they were presented in the packet. Following the instructions, participants were randomly assigned to one of four priming conditions: mortality-salience, theft-salience, social isolation-salience, and a control. Before the manipulation, participants completed the 1997 Right-Wing Authoritarianism Scale (RWA; full 30-item scale; Altemeyer, 1998) and a patriotism scale (Pratto, Sidanius, Stallworth, & Malle, 1994). Following these measures, participants were assigned to complete one of four open-ended questionnaires, constituting the prime for each condition.

Mortality-salience was manipulated using a questionnaire frequently employed in terror management research (e.g. Greenberg et al., 1990). Participants were asked to describe the emotions that the thought of their corporeal death arouses in them, and to describe what will happen as they physically die. The *theft-salience* condition entailed a similar probe, but asked participants to describe their emotions in the event that they came home to find that their home had been burglarized, and to describe their physical state as they came to this realization. Participants in the *social isolation-salience* condition were asked to imagine themselves completely isolated from family and friends, and to describe what would happen to them when they were physically alone. The *control* condition was similar to that used in TMT research—participants were asked to describe their emotional and physical state as they imagined watching their favorite television program.

Following the manipulation, participants completed the state PANAS-X (Watson & Clark, 1992), after which, following the method used by terror management researchers (Greenberg et al., 2001), they read two short essays ostensibly written by two foreign students. One essay presented the experiences and opinions of an individual critical of the US and its citizens; the other expressed sentiments that were flattering and praising of America and American values. Each essay was followed by the Interpersonal

Judgment Scale (*IJS*; Byrne, 1971) to measure participants' subjective evaluations of the target authors. This scale measures the participant's assessment of the target authors' likeability, intelligence, knowledge, morality, mental adjustment, truthfulness, and the extent to which the subject would want to work with the author in an experiment. Essays and evaluations were counterbalanced for order of presentation.

The questionnaire packet concluded with several demographic items, after which participants were instructed to seal their packet in a large manila envelope and deliver it to the research assistant. Finally, participants were debriefed, thanked, and paid for their participation.

Results and discussion

To assess whether the effects of the experimental treatment groups were mediated by mood changes caused by the manipulation, we conducted a multivariate regression analysis on the subscales of the PANAS-X gauging the types of affect likely to be aroused by our primes (fear, depression, hostility, and generalized negative affect). The aversive-thought primes had no effect on any of these subscales, suggesting that our primes did not significantly affect conscious mood.

In examining the effects of the aversive-thought primes on intergroup bias, we conducted a one-way ANOVA for condition (control, death, theft, social isolation) on pro-American bias.² The ANOVA revealed a marginally significant effect for condition ($F(3, 105) = 2.48, p = .07$). Planned comparisons of our

predictions for each experimental condition versus the control revealed a significant increase in pro-American bias for mortality-salience ($F(1, 105) = 5.43, p < .05$) and theft-salience conditions ($F(1, 105) = 4.39, p < .05$), but not for the social isolation-salience condition ($F < 1$). However, the differences among experimental conditions were not significant ($F(2, 105) = 1.54, p = .22$). Table 1 presents means and standard deviations relevant to this analysis.

To assess the mediating main effects and moderating interaction effects of personality and demographic variables on pro-American bias, we conducted a two-step hierarchical regression analysis. The first step of the model assessed the main effects of experimental condition (death, theft, isolation), personality covariates (patriotism, RWA), and demographic variables (gender, age, year in college) as predictors of pro-American bias. The second step assessed their interactions. Personality variables were included as interaction terms to (1) compare the slopes of the treatment conditions to the control group; and, (2) to facilitate the assessment of simple effects of each experimental condition estimated at both high and low levels of authoritarianism (MacCallum, Zhang, Preacher, & Rucker, 2002)[0]. Each experimental condition was represented by a dichotomous variable; the personality variables of authoritarianism and patriotism were entered as continuous values; the demographic variables of gender and ethnicity were entered as dichotomous variables, while age and year in school were entered as continuous values. Continuous variables were zero-centered, and dichotomous variables were dummy-coded

Table 1. Means and standard deviations of pro-American bias by condition (Study 1)

Pro-American bias	Experimental condition			
	Control	Mortality salience	Theft salience	Social isolation salience
Mean	0.86	1.67	1.57	1.12
SD	1.16	1.55	1.25	1.00
N	26	25	28	30

Note: Pro-American bias scores ranged from -1.33 to 4.83, with higher scores reflecting greater pro-American bias.

before the analysis (Aiken & West, 1991). Variables were entered into the model using a backward inclusion stepwise regression process (described in Hamilton, 1998, pp. 154–157). A term was retained by the model if it significantly increased the variance explained ($\beta < .05$) when all eligible predictors were in the model. In the first step of the regression, personality and demographic terms were entered into a base model consisting of terms for experimental condition and authoritarianism.

The first step of the regression revealed a marginally significant effect for condition ($F(3, 103) = 2.45, p = .07$). Patriotism was positively associated with pro-American bias ($F(1, 103) = 14.07, p < .001, \beta = .36$). The main effect for authoritarianism was not significant ($F < 1$).³ No significant differences were found among the mortality-salience, social-isolation, and theft-salience experimental conditions.

Interaction effects for the personality and demographic predictors with condition were assessed in the second step. Personality and demographic interactions with experimental condition were created using the products of the variables. Interaction effects for demographic and personality variables with condition were explored using a similar stepwise process to that described above. Blocks of interactions between each covariate and condition were added to the base model that consisted of experimental condition, authoritarianism, and patriotism. Interactions and main effects were retained if they significantly contributed to the unique variance explained by the model.

The second step in the regression maintained a main effect for patriotism ($F(1, 100) = 14.67, p < .001$), and revealed a marginally significant interaction for authoritarianism and experimental condition ($F(4, 100) = 2.04, p = .09$).⁴ Consistent with our predictions, the slopes for experimental conditions measuring increased pro-American bias as a function of authoritarianism were significantly different from the control slope ($F(1, 100) = 7.53, p < .01$), with no significant differences among experimental conditions ($F < 1$). Controlling for these variables, an effect for condition was found when a simple main effect was assessed at

the grand mean of RWA ($F(3, 100) = 2.74, p < .05$), with no differences among experimental conditions ($F(2, 100) = 2.11, p = .13$). To verify that the source of the significant interaction was caused primarily by participants scoring high on authoritarianism and to test our specific prediction that pro-American bias would be found only for high authoritarians and not for lows, simple effects of condition were assessed at high and low levels of authoritarianism. Simple effects for experimental condition assessed when RWA was dispositionally high (1 S.D. above the mean) were significantly higher than the control ($F(1, 100) = 11.51, p < .001$), with no differences observed among experimental conditions ($F(2, 100) = 1.38, p = .26$). Simple effects for each experimental condition were significantly higher than the control, but simple effects assessed at low levels of RWA (1 S.D. below the mean) were not significantly different from the control ($F < 1$). Effect sizes for experimental conditions (compared to controls) relevant to this analysis are shown in Figure 1.

Terror management researchers posit that because the worldview of high-authoritarians and political conservatives does not value tolerance of ideological heterogeneity, such individuals could bolster their worldview by expressing greater liking towards ingroup ideology and dislike for dissimilar views (Greenberg et al., 1990, 1992). Conversely, the worldview of low-authoritarians and political liberals is one of tolerance and appreciation for ideological heterogeneity; hence such individuals should be expected to bolster their worldviews by expressing greater tolerance of dissimilar views.

While agreeing with the logic of these predictions, we propose that differences in tolerance are important not because they assuage death-anxiety by bolstering individual worldviews, but rather because tolerance of dissimilar others is moderated by the type of ideation individuals believe is important to their relevant ingroups. High authoritarian individuals identify with groups that advocate intolerance for cultural diversity, while low authoritarians identify with groups that advocate the reverse. The observed

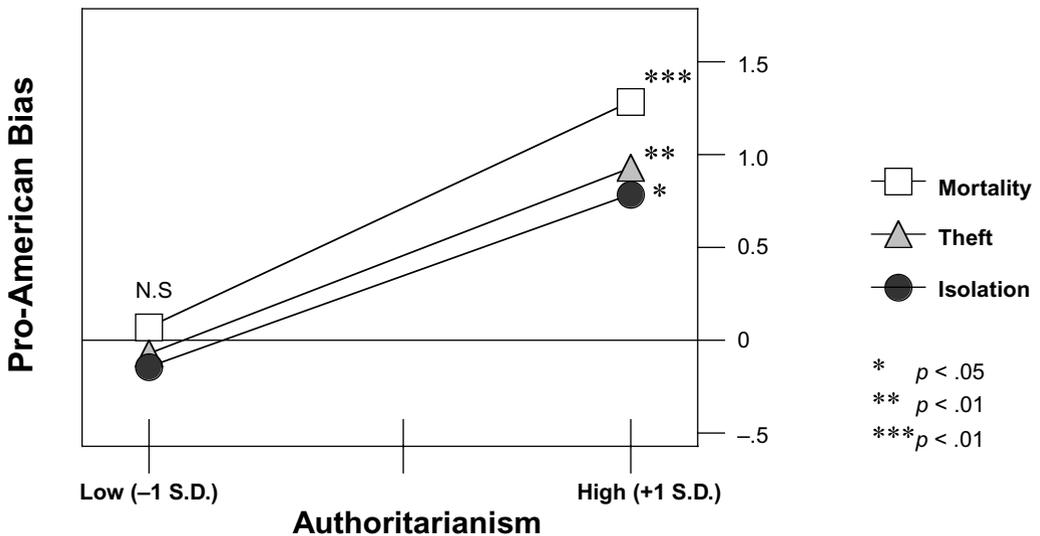


Figure 1. Standardized simple effects for pro-American bias as a function of authoritarianism and experimental condition. Symbols represent increase/decrease in pro-American bias after experimental manipulation at high and low levels of authoritarianism (1 S.D. above and below the mean) when compared to control condition at similar level. *P*-values reflect planned comparisons versus the control.

pattern (i.e. in threat conditions high authoritarians display increased intolerance and low authoritarians do not), is thus consistent with our hypothesis that, when faced with a threatening situation in which social alliances would be of particular importance, individuals advertise their conformity to the standards of their ingroup by overtly embodying those norms.⁵ Consistent with our predictions, and contrary to the claims of TMT, these effects are not limited to death-relevant threats.

Study 2

In Study 1, we demonstrated the effectiveness of our fitness-relevant aversive-thought primes in producing intergroup ideological bias. However, because we claim that these results reflect the workings of mechanisms which are in no way exclusively focused on death, we wanted to ensure that our aversive-thought primes were not subtly engendering death-related thoughts outside of focal consciousness. To assess the possibility that the effects found

in Study 1 occurred because our robbery and isolation primes subtly elicited death concerns among our participants, we therefore employed a manipulation check commonly used in TMT research to measure the salience of death concerns after mortality-salience induction. Participants are given a word-completion task that, according to terror management researchers, measures the accessibility of death-related thoughts on the fringes of consciousness (Arndt et al., 1997). Typically, participants are assigned to mortality-salience or a control condition, and then are required to complete the word completion task. In the analysis, the mean number of death words completed are compared between cells (i.e. MS vs. control). Our design followed this format, but included treatment conditions (unrelated to death) identical to those described in Study 1.

We also sought to rule out an interpretation that could be applied to the findings in Study 1 and to results from TMT research, namely that the preoccupation and vulnerability to death-related concerns that allegedly plays an

important role in the development of the authoritarian personality (Adorno, Frenkel-Brunswick, Levinson, & Sanford, 1950) are at the root of the striking differences found between low and high authoritarians in defensive reactions following mortality-salience induction (Greenberg et al., 1990). We therefore included the same measure of Right-Wing Authoritarianism (Altemeyer, 1998) used in Study 1 to examine the effects of authoritarianism on death concerns and its possible interaction with the aversive-thought manipulations in increasing death-thought accessibility.

Method

Participants Participants were undergraduate students enrolled in anthropology courses at the University of California, Los Angeles. Students participated voluntarily for a payment of \$4.00, completing a packet of questionnaires presented as an anonymous survey investigating personality and social attitudes. After removing 4 subjects from the analysis for failing to complete all items on the questionnaires, we were left with 100 participants (69 women and 31 men ranging in age from 18 to 30, mean = 20.5; mean year in university, 2.6). A multivariate regression analysis produced no significant differences in these demographic variables across conditions.

Procedure Participants were assigned to a control or an aversive-thought treatment group. Procedure and cell assignments followed those described in Study 1. Participants completed the RWA Scale (Altemeyer, 1998) followed by the respective manipulations described in Study 1. Participants then completed the state PANAS-X (Watson & Clark, 1992) followed by a word-stem completion task designed as a death-thought accessibility measure in which 6 of 25 word fragments could be completed with death related words, or neutral words (Arndt et al., 1997). The death-related words were 'buried', 'grave', 'killed', 'skull' and 'coffin'. The packet ended with several demographic items, after which participants were instructed to seal their packet in a large manila envelope and deliver it to the research assistant. Finally, participants

were debriefed, thanked, and paid for their participation.

Results and discussion

Death-thought accessibility was operationalized as the number of death-related words items completed in the word completion task. To assess the effects of the aversive-thought primes on death-thought accessibility and to explore the effects of demographic and personality measures, we employed the same statistical methods described for Study 1.

A one-way ANOVA assessing the effects of condition on death-thought accessibility revealed no significant main effect for condition ($F(3, 96) = 1.99, p = .12$). However, planned comparisons of our predictions that only the mortality-salience condition would lead to an increase in death-thought accessibility, but that theft and isolation-salience conditions would not, were supported. Mortality-salience led to an increase in death-thoughts ($F(1, 96) = 5.26, p < .05$), but no significant increase was found in the theft ($F < 1$), and social isolation-salience conditions ($F(1, 96) = 1.11, p = .30$). No differences among experimental conditions were found ($F(2, 96) = 1.48, p = .23$; Table 2).

To examine the mediating and moderating effect of personality and demographic variables, a hierarchical regression process similar to that described in Study 1 was employed. Demographic variables and personality variables were added to a model that included experimental conditions. The variables entered in the first step of the regression (including RWA) did not contribute to the variance explained by the model, and the base model was left unchanged.

The regression analysis revealed a significant interaction effect for gender, and main effect for experimental condition ($F(3, 92) = 5.48, p < .01$), with significant differences among conditions ($F(2, 92) = 7.86, p < .01$). RWA-condition interactions did not have significant effects on death-thought accessibility and were removed from the model. Of the demographic and personality variables assessed, the gender-manipulation interaction block was retained as a significant predictor ($F(4, 92) = 4.49, p < .01$).

Table 2. Number of death-related words completed in word-stem completion task by condition (Study 2)

Death-thought Accessibility	Experimental condition			
	Control	Mortality salience	Theft salience	Social isolation salience
Mean	1.64	2.21	1.66	1.92
SD	.91	.91	1.30	1.09
N	25	25	24	26

Note. Death-thought accessibility scores ranged from 0 to 4, with higher scores reflecting greater death-thought accessibility.

In the theft-salience condition, males exhibited lower death-thought accessibility than females compared to controls, but isolation and mortality-salience gender differences were not significantly different than controls ($F < 1$). Contrasts revealed a significant difference between mortality and theft ($F = 12.48$, $p < 0.001$), but no difference between theft and isolation-salience conditions ($F < 1$), suggesting gender differences in these two conditions were roughly similar. As predicted, when simple main effects were assessed after controlling for these gender differences, mortality-salience led to a significant increase in death-thought accessibility ($B = .67$, $SE = .24$, $p < .01$, $\beta = .70$) when compared to the control condition (control mean = 1.64, $SE = .16$), but no such increase was found for either the theft or social isolation-salience conditions ($F(1, 92) = 2.21$, $p = .14$, $F < 1$, respectively). Planned comparisons revealed significant differences in death-thought accessibility between mortality-salience and theft-salience conditions ($F(1, 92) = 12.33$, $p < .001$), and mortality and social isolation-salience conditions ($F(1, 92) = 3.92$, $p < .05$; Figure 2). This finding eliminates the possibility that the ingroup bias elicited by the theft and social isolation primes in Study 1 can be explained in terms of an indirect activation of mechanisms exclusively focused on death.

We were also able to rule out a possible alternative explanation for why high-authoritarians react so strongly to bolster ingroup ideology after being reminded of their corporeal death: We found no relationship between the level of death-thought accessibility and Right-Wing Authoritarianism, hence it is

unlikely that the preoccupation with death-related concerns that allegedly plays an important role in the development of the authoritarian personality (Adorno et al., 1950) is responsible for the striking differences found between low and high authoritarians in defensive reactions following mortality-salience induction (Greenberg et al., 1990). In fact, our data indicate that, at least at the unconscious level (the level at which the word-stem completion task is supposed to measure death-thought accessibility), there is no relationship between authoritarianism and vulnerability to death anxiety. This suggests that it is the ideological orientation of high-authoritarians that make their ingroup ideology defense so marked. The notable intergroup bias displayed by high-authoritarians in Study 1 thus remains consistent with our argument that the appropriate relational cognitions for servicing social relationships are different depending on the norms of the social group with which one identifies.

Overview of Studies 3 and 4

As with most studies using university students as participants, the generalizability of the results of our initial investigations is limited by the circumscribed nature of the subject pool. If our coalitional-psychology thesis is correct, these effects should appear not merely among North American undergraduates, but also among participants possessing markedly different beliefs and life experiences. Because we sought to develop a theory of coalitional psychology that could travel, we were interested



Figure 2. Death-thought accessibility after manipulation. Means reflect effects controlling for gender differences in responses. Effects shown in standardized units.

in conducting research in a smaller-scale society, using participants not exposed to a university education, with differing cultural values regarding death and personal autonomy. Moreover, because we hold that the ability to acquire and use cultural information has been a core determinant of fitness throughout the history of our species (Boyd & Richerson, 1985, 1992) we presume that the postulated evolved coalitional psychology mechanisms should be sensitive to, and differentially act upon, the local cultural context. In order to explore how such information impacts the working of the system, we wished to examine the impact that cultural differences in self/other distinctions might have on the ethnocentric effects of aversive thoughts.

Interdependence

A major theme in cross-cultural research is the concept of *individualism* and *collectivism*. Research on this concept began primarily as an effort to demonstrate the importance of

cultural differences in shaping individual thought, behavior and attitudes (Triandis, 1972). The individualism/collectivism distinction has since been lauded by some researchers as a primary point of analysis for the most basic understanding of a culture, and is said to be one of the most distinctive dimensions of cultural variation (Fiske, Kitayama, Markus, & Nisbett, 1997). Individualism describes a cultural ethos emphasizing values such as independence, self-reliance, individual rights, and self-actualization. Conversely, collectivism focuses on sociocentric values such as interdependence, duty, and conformity to social norms. Individuals have access to both individualist and collectivist perspectives, and will activate them depending on the situation, and all individuals in every society have personalities that include components of both. However, patterned differences in mean levels of collectivist sentiments have been consistently found across cultures (Oyserman, Coon, &

Kemmelmeier, 2002). Within populations, individual differences in the general orientation towards one or the other pole are reflected in a personality dimension labeled *allocentrism* and *idiocentrism* (Triandis, Leung, Villareal, & Clack, 1985). In this paradigm, allocentrics view the self as emotionally and socially interdependent with others, less concerned with individual success and more concerned with the success of their relationships and ingroups (Suh, Diener, Oishi, & Triandis, 1998).

Rural Latin American cultures are believed to shape individual thought processes towards the sociocentric direction along the individualism/collectivism spectrum. In general, Latin Americans voice greater attachments to family and community, and see themselves as more emotionally interdependent with others than do North Americans (Avendano Sandoval & Dias Guerrero, 1992; Triandis, 1993; Triandis, Marin, Lisansky, & Betancourt, 1984). Central Americans in particular have been shown to exhibit some of the strongest collectivist sentiments and interdependent self-identities of the societies yet studied. Hofstede (1991) found Costa Rica, Panama, and Guatemala to be the most collectivist out of 52 cultures studied when collectivism was defined as a rejection of individualist values and uncertainty avoidance in social relationships.

Rural Costa Rica

Costa Rica is a small Central-American nation with a population of less than 4 million inhabitants, about a third of whom live in rural areas. Although still a largely agricultural country, it has achieved a relatively high standard of living and literacy rate for Latin America.⁶ Most citizens have some formal education: school is compulsory up to age 12, and about 25% of elementary school graduates go on to secondary institutions. Traditionally, like many Latin Americans living in developing countries filled with political strife, Costa Ricans were said to identify more with their regional area than with the country as a whole (Jones, 1935). However, since 1948, Costa Rica has been an exception in Central America in its lack of political strife and violence. Costa Ricans are reported to be quite

proud of this fact, and (possibly due to stability of the state) exhibit strong pro-nationalist tendencies, believing their country to be a distinct beacon of sanity and goodness in a tumultuous region (Beisanz, Beisanz, & Beisanz, 1999; Meléndez, 1991).

For these studies, we sought to explore the centrality of death as a source of anxiety in a cultural setting where death anxiety is openly discussed,⁷ and where fears such as social isolation may be hypercognized (Levy, 1973) and culturally elaborated to be particularly aversive. Furthermore, we sought a population literate enough to understand the concept of an attitudinal survey, but where people have not been exposed to the homogenizing effects of a university environment.⁸ Lastly, we wanted to conduct our studies with participants having a strong nationalist identity who derive part of their self-identity as group members of a nation-state. For these reasons, rural Costa Rica provided an optimal setting to test the generalizability of our relational theory of coalitional psychology while exploring between-culture differences in ethnocentric evaluations of dissimilar others, as well as the individual personality correlates of the phenomenon.

Self-esteem

Self-esteem plays a critical role in TMT, as investigators have shown that individuals having high self-esteem respond far less to mortality-salience than do individuals having low self-esteem (Harmon-Jones et al., 1997). While proponents of TMT claim that this occurs because high self-esteem indexes possession of a strong buffer against death terror (i.e. one has met the standards of one's worldview and can therefore live with equanimity despite the knowledge of one's inevitable death), emerging perspectives on self-esteem suggest that this pattern is more plausibly explained in terms of the relationship between self-esteem and the likelihood of coalitional support in times of need. Leary, Tambor, Terdal, and Downs (1995) describe self-esteem as a *sociometer*, that is, a representation to the self of the degree to which one is central to, or peripheral to, the social group. Noting the functional significance

of group inclusion, Leary and colleagues argue that the hedonic aspects of self-esteem serve to motivate behaviors that enhance acceptance by the group. Reasoning along similar lines, Fessler (2001) argues that the emotions of shame and pride index instances of failure or success with regard to both cultural standards for behavior and questions of social dominance; self-esteem provides a representation of one's current standing in the group by summing one's history of shame- and pride-inducing events. Finally, Kirkpatrick and Ellis (2001) argue that there are numerous functionally distinct self-esteem sociometers, each indexing how well one is performing in a given fitness-relevant domain; global self-esteem can thus be seen as a running tally of one's fitness prospects, with performance in a variety of social arenas constituting a critical determinant thereof. If, as these investigators suggest, self-esteem is an index of how well one is equipped to meet fitness challenges, and if such readiness is importantly determined by one's degree of social integration, then it follows that individuals having high self-esteem should work less hard to recruit allies when faced with threatening situations than individuals having low self-esteem, as the former can more reliably count on others to provide support when needed. On the basis of this reasoning we predicted that, as found by TMT researchers, death-related primes should have a greater enhancing effect on intergroup bias in low self-esteem individuals. However, in contrast to TMT, we also predicted that the same should be true of threat primes that do not evoke thoughts of death.

In Study 3, we sought to demonstrate in a second, culturally disparate population that similar psychological mechanisms to those underlying the ideology defense effects produced by mortality-salience could be produced by non death-salient but fitness-relevant primes, and that these effects were moderated by the same individual differences in social orientation or personality dimensions as those demonstrated in terror management research (i.e. authoritarianism and self-esteem). In Study 4 we sought to replicate the

efficacy of our alternative, aversive-thought primes in another Costa Rican sample, while addressing the theme of how the cultural elaboration of social interconnectedness might interdigitate with panhuman coalitional psychology. Inspired by the insights of theorists who have proposed individualism/collectivism as a potentially key moderator of intergroup bias (Fishbein et al., 2001; Triandis & Trafimow, 2001), we investigated the effects of this construct on defense of ingroup ideology.

Study 3

Our predictions were similar to those in Study 1: Increases in intergroup bias after exposure to aversive themes unrelated to death were predicted to be indistinguishable from those caused by mortality-salience. These effects were predicted to be moderated by authoritarianism and self-esteem, such that positive interactions with the manipulations were predicted for authoritarianism, and negative interactions were predicted for self-esteem (i.e. more strident ideology defense predicted for those low in self-esteem and those high in authoritarianism). Again we made no predictions about demographic variables, but sought to explore their effects as potential mediators or moderators of intergroup bias.

Methods

Participants Participants were Costa Rican citizens (35 women and 40 men ranging in age from 17 to 62; $M = 27.8$; Education: 0–16 years, mode = 6) living in rural areas of the country.⁹ Participants were recruited in Cerros (approximate population 1400), a small town in a palm-oil plantation region approximately 20 kilometers inland from the Pacific coastal port of Quepos (approximate population 7,000); and Primavera, a series of hamlets surrounding the banana exporting town of Cariari (population 4,000) on the Caribbean side of the country. Participants were recruited in public areas (parks, bus stops, etc.) to participate in a survey on personality and social attitudes. Because the literacy levels of our participants varied greatly, surveys were conducted in a

structured interview format (Bernard, 1995). All interviews were conducted in informal Spanish by two Costa Rican research assistants who were blind to the hypotheses tested.

Procedure All items from questionnaires were read aloud and participants were asked if they agreed or disagreed with each item. The degree to which they agreed or disagreed was then gauged by asking participants if they were in complete or slight agreement or complete or slight disagreement depending on their first answer. Answers were coded on a four point, forced-choice scale (1 = completely disagree, 2 = slightly disagree, 3 = slightly agree, 4 = completely agree).

The interview began with a Spanish-language translation of a condensed RWA instrument (Altemeyer, 1998),¹⁰ followed by a patriotism scale. The manipulation followed, consisting of translations of the primes used in Studies 1 and 2, with the exception that participants in the control condition were not primed. Following the manipulation, the Rosenberg Self-Esteem Scale (Rosenberg, 1965) was administered. Two extra items were added to the self-esteem questionnaire in order to provide a further delay between the manipulation and the primary dependent measures. Participants were then read two fictitious essays, allegedly written by immigrants from another Central American country, about the authors' experiences in Costa Rica. The content of the essays was virtually identical to that of essays used in Study 1 and in TMT research (i.e. one with pro-Costa Rican sentiments, the other critical of Costa Rica and its citizens). Following each essay participants were interviewed using questions inspired by the Interpersonal Judgment Scale (*IJS*; Byrne, 1971). Participants were asked to what extent they thought the author was likeable, intelligent, knowledgeable, moral, mentally well-adjusted, truthful, and the extent to which the participant would want to work with the author (e.g. not at all intelligent, somewhat unintelligent, somewhat intelligent, very intelligent). The interview concluded with a series of demographic questions.¹¹

Results and discussion

To assess our predictions, we conducted a one-way ANOVA, and a two-step, hierarchical regression analysis identical to that described in Study 1. Pro-Costa Rican bias was measured by subtracting the mean rating of the anti-Costa Rican target from the mean rating of the pro-Costa Rican target for each subject. The ANOVA analysis revealed a significant main effect for condition ($F(3, 71) = 3.21, p < .05$), with significant differences among experimental conditions ($F(2, 71) = 3.53, p < .05$). Planned comparisons between the control condition versus each experimental condition revealed significant increases in pro-Costa Rican bias for theft-salience ($F(1, 71) = 3.83, p = .05$), and social isolation-salience ($F(1, 71) = 5.48, p < .05$), but that the mortality-salience condition was not significantly different than the control ($F = 0$). Further comparisons revealed that the social isolation-salience condition was not significantly different than the theft-salience condition ($F < 1$), but that both isolation-salience and theft-salience led to significantly greater pro-Costa Rican bias than mortality-salience ($F(1, 71) = 5.80, p < .05, F(1, 71) = 4.10, p < .05$, respectively)—results wholly inconsistent with the predictions of TMT (Table 3).

Step 1 examined the main effects of experimental condition, patriotism, authoritarianism, self-esteem,¹² and demographic variables on pro-Costa Rican Bias. As in previous analyses, personality and demographic variables were entered stepwise into a base model that included terms for experimental condition. The first step in the regression revealed main effects for self-esteem ($F(1, 70) = 6.13, p < .05$),¹³ and experimental condition ($F(3, 70) = 2.95, p < .05$), with significant differences among the three experimental conditions ($F(2, 70) = 3.57, p < .05$). Self-esteem was negatively correlated with pro-Costa Rican bias ($B = -.03, SE = .01, \beta = -.31$). RWA, patriotism and demographic variables did not mediate these effects.

Of importance, the regression revealed that participants in the theft and social isolation-salience conditions displayed increased pro-Costa Rican bias compared to the control ($F(1,$

Table 3. Means and standard deviations of pro-Costa Rican bias by condition (Study 3)

Pro-Costa Rican bias	Experimental condition			
	Control	Mortality salience	Theft salience	Social isolation salience
Mean	.69	.67	1.19	1.33
SD	.81	.78	.82	.76
N	21	22	18	14

Note: Pro-Costa Rican bias scores ranged from -0.83 to 3 . Higher scores reflect greater pro-Costa Rican bias.

71) = 6.50, $p < .01$), and were not significantly different from each other ($F < 1$). Contrary to the claims of TMT as to the importance of death anxiety in engendering ideology defense, planned comparisons revealed that mortality-salience did not lead to an increase in pro-Costa Rican bias, and produced an effect that was significantly lower than that found for theft-salience ($F(1, 70) = 5.48$, $p < .05$), and isolation-salience conditions ($F(1, 70) = 4.45$, $p < .05$).

The second step of the regression revealed a significant interaction for self-esteem and condition ($F(4, 67) = 5.75$, $p < .001$). No significant differences were observed among experimental conditions ($F = 1$). An effect for experimental condition was only marginally significant when simple effects measuring Costa Rican bias were assessed at the mean of self-esteem ($F(3, 67) = 2.36$, $p = .08$). However, simple effects assessed when self-esteem was low (1 S.D. below the mean) produced a significant effect for condition ($F(3, 67) = 3.46$, $p < .05$), with no significant differences among experimental conditions ($F(2, 67) = 1.57$, $p = .22$). These simple effects were smaller and not significant when self-esteem was dispositionally high ($F(3, 67) = 1.31$, $p = .28$), suggesting that the interaction was driven primarily by participants scoring low in self-esteem. Planned comparisons testing simple effects of each experimental condition from the control when self-esteem was low revealed significant increases in pro-Costa Rican bias for social isolation and theft-salience conditions. However, mortality salience failed to increase intergroup bias even when self-esteem was dispositionally low. Simple effects by experimental condition assessed at high and low levels of self-esteem are

shown in Figure 3. No significant differences were found among experimental conditions ($F(2, 67) = 2.01$, $p = .14$).

The moderating effects of self-esteem on intergroup ideological bias are consistent with core aspects of our theoretical perspective: If global self-esteem constitutes a running tally of one's fitness prospects, providing an index of how well one is equipped to meet fitness challenges (in part determined by one's degree of social integration), and if ingroup ideological bias is increased in the service of recruiting social support, then it follows that, in times of threat, individuals with low self-esteem should exhibit increased intergroup bias in order to attract support, while those with high self-esteem need not advertise in this fashion.

Our interpretation of the role played by self-esteem is congruent with a body of literature indicating that people on the periphery of desirable ingroups express greater attachment towards ingroup ideals and express more outgroup derogation than those at the ingroup core (see Hewstone, Rubin, & Willis, 2002 for a review). For example, Middle Eastern Jews, although they are more likely to physically resemble Arabs, report more intense hostility and prejudice towards Arabs than do European Jews. Middle Eastern Jews, who are relatively peripheral and lower status members of Jewish society, may use derogation of Arabs to gain acceptance by the higher-status, core members of Jewish society (Peres, 1971). A similar argument has been made for poor Whites on the periphery of White society in North America: correlational studies have shown that poor Whites report more racial prejudice compared with higher-status, upper-income

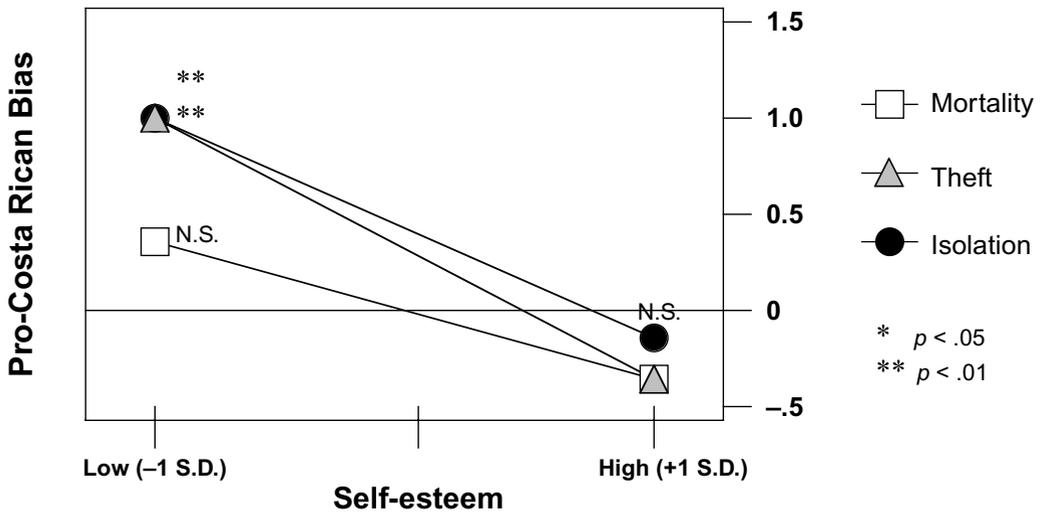


Figure 3. Standardized simple effects for pro-Costa Rican bias as a function of self-esteem and experimental condition. Symbols represent increase/decrease in pro-Costa Rican bias after experimental manipulation at high and low levels of self-esteem (1 S.D. above and below the mean) when compared to control condition at similar level. *P*-values reflect planned comparisons versus the control.

Whites (Katz, Wackenhut, & Hass, 1986). Noel, Wann, and Branscombe (1995) present experimental results showing that people with peripheral membership status in an ingroup express negative judgments about a comparison outgroup, particularly when an ingroup audience is anticipated. The authors argue that ingroup bias, particularly in the form of outgroup derogation, can serve an impression management function that allows for enhancement of an insecure status in a desirable group. After reviewing evidence that those with low self-esteem are more prone to be cognizant of the risk of interpersonal rejection and to underline their own prosocial qualities, Vohs and Heatherton (2001) demonstrate that when confronted with an ego-threat, individuals with low self-esteem modify their behavior so as to become more likeable to peers, a shift that is mediated through perceptions of the self as interdependent with others. Hence, in both naturally occurring and artificially created groups, those who likely see their status as more tenuous work harder to advertise their conformity to ingroup norms, derogating

outgroup members and otherwise adjusting their self-presentation so as to increase their appeal to relevant others. When combined with findings concerning the centrality of social acceptance and norm adherence to self-esteem (Kirkpatrick & Ellis, 2001; Leary, Cottrell, & Phillips, 2001), these results lend credence to our interpretation of the interaction between self-esteem and responses to threat-primers, importantly including primes that do not concern death.

Authoritarianism No significant interaction effects were observed for authoritarianism and condition. That our analysis failed to find moderating effects of authoritarianism on intergroup bias seems puzzling at first glance. However, a graphical inspection of the slopes for the participants' evaluations of the pro-Costa Rican target using the raw values revealed that this was due to ceiling effects for ingroup bias among participants high on authoritarianism. Low authoritarians in the experimental conditions appeared to exhibit greater ingroup bias than control lows, but experimental highs

did not show greater bias than control highs because control highs had reached the maximal levels of pro-Costa Rican bias on the measurement instrument. To confirm this observation, an analysis of simple effects for experimental condition at one standard deviation below and above the mean on RWA was conducted. Simple effects assessed when RWA was high were not significant, but simple effects assessed when RWA was low did produce significant results ($F(3, 67) = 5.62, p < .001$).

That this difficulty plagued our Costa Rican sample and not our UCLA sample is likely a consequence of the differences in the baselines of the two culturally disparate groups: descriptive statistics reveal that, compared to our UCLA sample, there were no truly low authoritarians in our Costa Rican sample. Our rural, nonuniversity educated Costa Rican participants utilized the top half of the RWA scale for most of their answers, while our liberal, social-science major UCLA participants employed the bottom half of the scale for most of their answers. On a scale of 1 to 9, our UCLA participants' average response was a 3.6 (Min: 1.1, Max: 6.4, S.D. = 1), which translates to a value between 'disagree' and 'somewhat disagree' on the instrument. Altemeyer's Canadian undergraduates at the University of Manitoba consistently averaged just below the neutral midpoint on the scale (approximately 4.7 on the instrument; Altemeyer, 1996). In contrast, our rural Costa Rican participants averaged 3.1 on a scale from 1 to 4 (Min: 1.9, Max: 4, S.D. = .48), which translates to a value slightly above 'somewhat agree'.

It is therefore to be expected that low authoritarians in our Costa Rican sample would exhibit increased intergroup bias after exposure to aversive thoughts since such individuals are low authoritarians relative only to other rural Costa Ricans in our sample, but exhibit roughly average levels of authoritarianism on the scale, and mid to high levels compared to our UCLA sample. Seen in this light, the results of Study 3 are consistent with Study 1 in that participants exhibiting roughly similar levels of authoritarianism produced similar increases in intergroup bias after aversive-thought induction.

Study 4

In Study 3 we replicated the effects of our non death-related, aversive-thought primes in producing intergroup ideology bias outside of a North American university context. We were particularly intrigued by our finding that social isolation-salience produced greater ideology-defense effects than did mortality salience. We conjectured that cultural differences in the conceptualization and importance of social relationships might be the cause of these differences. Since Costa Ricans value interconnectedness and view their personal success as dependent on their relationships with others, the notion of complete social isolation may be internally assessed as a fitness challenge more dire than that assessed by our more individualist-oriented UCLA undergraduates. Thus the motivation to form the necessary bonds with relevant ingroup members in such a situation may be more critical for those who feel dependent on others to meet fitness challenges than for those who do not. If correct, this notion suggests that, within a single culture, individuals who vary in their self-assessment of the importance of interconnectedness should react differentially to fitness threats, since those whose self-assessed high dependence on others to meet life challenges should exhibit more strident pro-ingroup signals in order to attract social support.

Given the importance of interdependence in our theory of coalitional psychology, we designed a fourth study to explore the relationship between the personality dimension of allocentrism and changes in intergroup bias in response to threat. We predicted that allocentrism should positively predict pro-Costa Rican bias as a function of exposure to aversive-thought induction. Therefore, the interaction between allocentrism and experimental treatment groups was expected to positively predict intergroup bias when compared to the control and that any main effects would be caused by participants scoring high in allocentrism.

Methods

Participants Participants were Costa Rican citizens (53 women and 33 men ranging in age

from 15 to 65; Mean Age = 30.4) from rural and urban areas of the country. Because urban dwellers are commonly thought to exhibit fewer collectivist-type traits (Triandis, 1993), in an attempt to acquire a sample that would produce a normal distribution of allocentrism scores, we recruited a third of the participants for this study in a suburban area of a major city in the Central Valley of Costa Rica in addition to samples drawn from the rural areas of Costa Rica described earlier. Approximately two-thirds of the participants were recruited from the two rural areas described in Study 3, while the remaining third were recruited from the capital city of San Jose (population 2.5 million), in central Costa Rica. Recruitment procedures were the same as Study 3. Because the literacy levels of our participants varied greatly (Education: 0–16 years of study; median = 8.0), surveys were conducted using the structured interview format described in Study 3. All interviews were conducted in informal Spanish by the first author.

Procedure The interview began with a condensed, Spanish-language translation of the ESTCOL (Realo et al., 1997), a personality scale used to assess individual differences in allocentrism. This scale has three subscales (family allocentrism, community allocentrism, and patriotism) with all items worded in the third-person tense believed to be more consistent with collectivist verbal styles. After each item was read, participants were prompted for their level of agreement/disagreement using the four-point, forced-choice scale described in Study 3. Two practice items were administered first to familiarize participants with the format.

Participants were assigned to one of three conditions:¹⁴ mortality-salience, social isolation-salience, and a control. The experimental manipulations were identical to those described in Study 3. The rest of the procedure was identical to that described in Study 3.

Results and discussion

To assess our predictions, we conducted a one-way ANOVA and a hierarchical regression analysis similar to that described in Studies 1

and 3. The ANOVA revealed a significant main effect for condition ($F(2, 83) = 3.32, p < .05$). As predicted, participants asked to contemplate social isolation displayed greater intergroup bias than those in a control group ($F(1, 83) = 4.31, p < .05$). As was the case in Study 3, mortality-salience did not lead to an increase in pro-Costa Rican bias ($F < 1$), and was significantly lower than social-isolation ($F(1, 83) = 5.46, p < .05$) (Table 4).

The first step of the regression revealed significant main effects for age,¹⁵ ($F(1, 82) = 3.94, p < .05$) and condition ($F(2, 82) = 3.19, p < .05$), with a significant difference between experimental conditions ($F(1, 82) = 4.81, p < .05$). Controlling for the effect of age, the regression revealed that isolation-salience led to a significant increase in pro-Costa Rican bias ($B = .46, SE = .22, p < .05, \beta = .47$) when compared to the control, but mortality-salience did not ($F < 1$). As in Study 3, contemplation of social isolation led to greater pro-Costa Rican bias than did contemplation of death ($F(1, 82) = 4.81, p < .05$).

As predicted, the second step revealed a significant interaction for allocentrism and condition ($F(3, 79) = 2.93, p < .05$). The slopes measuring increased pro-Costa Rican bias as a function of experimental condition were significantly different from the control ($F(2, 80) = 4.89, p < .01$), with only marginal differences between experimental conditions ($F(1, 80) = 3.53, p = .06$). Age was still significant ($F(1, 79) = 4.07, p < .05$). Controlling for these effects, the simple effect for experimental

Table 4. Means and standard deviations of pro-Costa Rican bias by condition (Study 4)

<i>Pro-Costa Rican bias</i>	Experimental condition		
	Control	Mortality salience	Social isolation salience
<i>Mean</i>	.69	.61	1.21
<i>SD</i>	.84	1.10	.91
<i>N</i>	30	26	30

Note. Pro-Costa Rican bias scores ranged from -2.17 to 3 , with higher scores reflecting greater pro-Costa Rican bias.

condition assessed at the mean of allocentrism was significant when compared to the control ($F(2, 79) = 3.63, p < .05$). Planned comparisons showed that the simple effect for social isolation-salience was significantly different than the control ($F(1, 79) = 4.68, p < .05$), but that the mortality-salience condition was not ($F < 1$). As in the previous analyses, a social isolation vs. mortality-salience contrast revealed that pro-Costa Rican bias was significantly greater after social isolation-salience than after mortality-salience ($F(1, 79) = 5.92, p < .05$).

Simple effects calculated at 1 S.D. above the mean for allocentrism revealed a significant effect for experimental condition ($F(1, 79) = 3.88, p < .05$), with no significant differences between experimental conditions ($F < 1$). Figure 4 displays comparisons between each experimental condition and the control, revealing significant increases in pro-Costa Rican bias for both social isolation and mortality-salience conditions when allocentrism is dispositionally high. Simple effects assessed at 1 S.D. below the mean revealed a significant effect for

experimental condition ($F(2, 79) = 4.69, p = .01$). Mortality-salience led to significant decreases in pro-Costa Rican bias compared with the control, but social isolation-salience did not (Figure 4).

These results replicated those of Study 3, clearly demonstrating that Costa Rican participants asked to contemplate social isolation respond with greater defense of ingroup ideology, but that contemplation of death fails to produce the same effect in the absence of moderating variables. Although contemplation of death modestly increased pro-Costa Rican bias when allocentrism was dispositionally high, without a moderator, mortality-salience failed to produce the main effect of increasing ideology defense as predicted by terror management theory. Consistent with our predictions, contemplation of complete social isolation increased pro-Costa Rican bias, both by itself and as a function of allocentrism. These results support the notion that, given that members of any single society can be expected to vary in the degree to which they

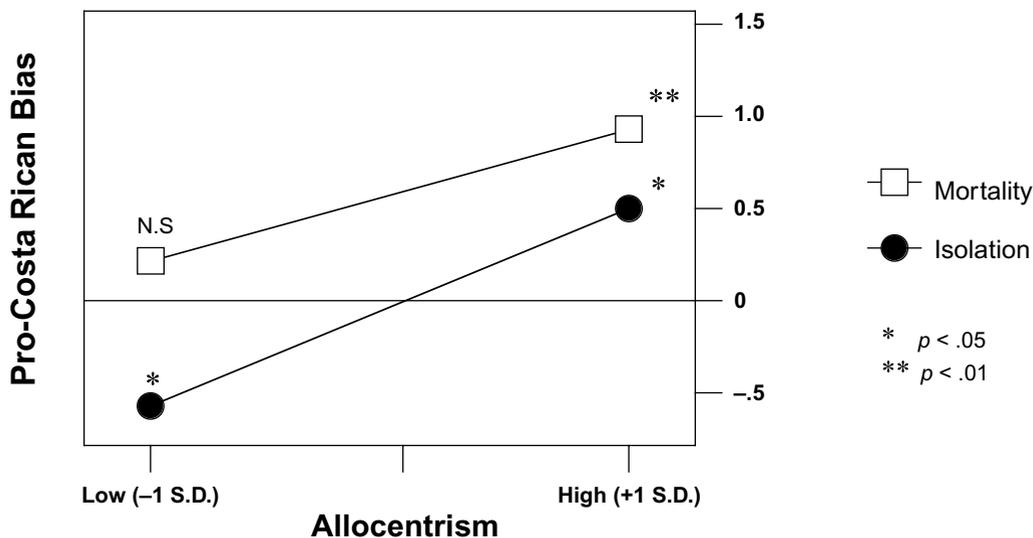


Figure 4. Standardized simple effects for pro-Costa Rican bias as a function of allocentrism and experimental condition. Symbols represent increase/decrease in pro-Costa Rican bias after experimental manipulation at high and low levels of allocentrism (1 S.D. above and below the mean) when compared to control condition at similar level. *P*-values reflect planned comparisons versus the control.

have internalized prevailing cultural understandings (Spiro, 1961), in a cultural environment that emphasizes interdependence over individualism, persons who have strongly internalized sociocentric values should be notably more reactive in their attempts to recruit social support through conformism than those who do not, as the former can be expected to place greater priority on the utility of group versus individual solutions to challenges that confront the actor.

Most importantly, the experiment replicated the key results of Studies 1 and 3, namely that changes in social evaluation that result in intergroup bias were found for participants who contemplated aversive themes not limited to those that elicited thoughts of death.

General discussion

In Study 1 we demonstrated that increased ingroup ideology bias could be elicited without reminding participants of their mortality. Contrary to TMT proponents' claims regarding the unique primacy of death, we believe that enhanced ingroup bias stems from contemplation of a class of circumstances which, were they to occur, a) would have had deleterious fitness consequences in the environments in which humans evolved, and b) would have been most effectively addressed using the support of allies. Experimental effects were moderated by individual differences in authoritarianism, fear, and depression. Using measures commonly employed in TMT research, Study 2 demonstrated that, unlike those who reflected on their own death, participants who contemplated non-death-related aversive themes showed no increase in death-thought accessibility, hence the cognitive consequences of thinking about being robbed or isolated are not explicable in terms of the elicitation of thoughts of death. In Studies 3 and 4 we replicated elements of Study 1 while exploring the moderating effects of authoritarianism, self-esteem, and allocentrism on intergroup bias in two Costa Rican samples. These results extend the evidence that 'mortality-salience effects' are not unique to thoughts of death. The evidentiary value of these findings

is strengthened by the fact that these results were obtained in a cultural context quite different from a North American university environment, and speaks to the strength of our theory in making predictions about panhuman psychological mechanisms and the manner in which they operate in differing cultural contexts.

We found evidence of cultural differences in the effectiveness of various aversive-thought primes as elicitors of intergroup bias. Among our UCLA undergraduates, mortality-salience produced a greater increase in intergroup bias than social isolation and theft-salience, although the differences were not significant. In contrast, among our Costa Rican participants, social isolation consistently produced greater intergroup bias than mortality-salience.¹⁶ These differences in main effects for experimental condition were statistically significant.¹⁷ We suspect that these patterns reflect real differences between cultures in the extent to which particular classes of solutions to adaptive challenges are culturally elaborated. Different aspects of the functional, relational needs observed in people in every society may be hypercognized in different cultures (Levy, 1973), causing particular scenarios to be markedly aversive in a given society. Specifically, social isolation may be a more significant threat in societies that emphasize collective as opposed to individual responses to challenges, while death fears may not be particularly salient to individuals in societies where religious beliefs and fatalistic attitudes (Triandis, 1995) make avoiding potentially lethal themes less troublesome than for people living in complex industrialized nation-states where cultures emphasize secular life, longevity, and control over destiny. More cross-cultural research on larger samples than those presented here is clearly needed to explore the relationship between cultural variation and coalitional psychology. For now, we are open to the notion that, in some societies, the possibility of complete social isolation may provoke anxieties more profound than the fear of death, said to be at the root of much of human striving for meaning.

Our results provide compelling evidence that so-called mortality-salience effects of intergroup

bias can be produced using fitness-relevant primes without reminding participants of their mortality. These effects are moderated by the same differences in individual personality and ideological orientation as those found in terror management research (authoritarianism, self-esteem), as well as by the novel moderator we have explored (allocentrism). Together, these patterns support our contention that humans possess psychological mechanisms that shape reactions to situations that would have threatened biological fitness under ancestral conditions. These mechanisms adjust behavior as a function of the need to improve one's chances of receiving coalitional support, generating output that is shaped by the culture of the group with which one identifies.

As a species, we are unique in our fundamental reliance on both shared standards for behavior and extensive cooperation among unrelated individuals (Boyd & Richerson, 1985). Indeed, recent terror management research has documented that group identification and close social relationships are key themes in the investigation of intergroup bias and ideology defense (e.g. Mikulincer et al., 2002). Despite the adamancy of their redundant claims regarding the unique centrality of death in human psychology and human culture, terror management advocates acknowledge that 'it is still possible that some yet unspecified category of aversive events is the real culprit responsible for the results of our mortality salience studies' (Greenberg et al., 1994). Here we have posited and found evidence that the category of aversive events responsible for such results is one that includes personal threats relevant to the need for social support. We believe that the theory of coalitional psychology presented here provides a compelling and coherent account of the phenomenon of anxiety and intergroup bias so impressively documented by terror management researchers, one which is potentially highly productive of additional testable predictions.

Notes

1. A preliminary multivariate regression revealed no difference across conditions for any demographic variable.
2. Following terror management researchers, the variable of pro-American bias was created by subtracting the mean rating of the anti-American target from the mean rating of the pro-American target for each subject.
3. Readers might find it a curious finding that authoritarianism did not correlate significantly with pro-American bias. However, a post-analysis revealed that authoritarianism was positively associated with the dependent variable, but that after patriotism was added to the model, it no longer contributed to unique variance explained by the model.
4. There were no significant interaction effects for any of the demographic measures assessed for patriotism. However, the significant main effect for patriotism was maintained. The $RWA \times$ condition interactions described here control for the effects of patriotism. This suggests that the interaction is not being caused by participants' allegiance to the ingroup, but is caused by the ideology of low/high authoritarianism. Duckitt, Wagner, du Plessis, and Birum (2002) argue that the definition of authoritarianism should be narrowed to describe the extent to which one tolerates deviance from social norms. If this is the case, then the interaction is caused by the fact that the low authoritarians tolerate more ideological heterogeneity after coalition psychology has been primed and that high authoritarians tolerate less. This leads to less intergroup bias for lows, and greater intergroup bias from highs.
5. An examination of effects sizes for pro-American bias by experimental condition at high and low levels of authoritarianism suggest that the 'antagonistic' interaction observed for the social isolation-salience condition and authoritarianism may be responsible for the lack of a main effect of this condition compared to the control. High authoritarians show increased pro-American bias, and it appears that low authoritarians show decreased pro-American bias when compared to the control, resulting in no main effect.
6. Instituto Nacional de Estadística y Censos 2001. *IX Censo Nacional de Población y de Vivienda del 2000: Instituto Nacional de Estadística*. Census statistics available at <http://www.inec.go.cr/INEC2>.

7. Many Hispanic authors have noted that death fears are more likely to be expressed openly in many Latin American cultures instead of repressed as they often are in the North (e.g. Delibes, 1966; Fierro, 1980). Death themes have been staples of Hispanic literature for centuries and may have pre-Columbian roots (Siefken, 1993).
8. By *homogenizing* we mean the effects that a modern, liberal university education can have on attitudes and values. Haidt, Koller, and Dias (1993) have shown that, in at least some domains, across cultures university students resemble each other in social attitudes more than they resemble their fellow citizens living outside the university walls.
9. A multivariate regression on demographic variables revealed no significant differences in age, education or sex ratio across conditions.
10. Eight items from the original scale were chosen using principal-components factoring of our RWA data from Study 1. Only top-loading items (Eigenvalues above 4.0) were used for this study.
11. All measures except from the Rosenberg Self Esteem Scale were translated into Costa Rican Spanish by the first author and Priscilla Estrada Leon. The exact Spanish-language measures used in this study are available by request.
12. Due to a left-tailed skew in the distributions of authoritarianism and self-esteem, power transformations of these variables were conducted before the analysis.
13. As a check to ensure that the manipulation did not affect a key independent measure in our analysis, we added self-esteem scores to the multivariate regression to investigate the possibility that the manipulation affected participants' self-esteem. Since it did not, we felt it justified the use of the measure as an independent variable in our analysis.
14. Since this experiment was specifically designed to address the notion of interconnectedness and intergroup bias, we used only mortality and social isolation-salience treatments as aversive-thought conditions and did not include a theft-salience condition.
15. Age was positively associated with pro-Costa Rican bias ($B = .02$, $S.E. = .01$, $\beta = .22$), and remained significant in the second step.
16. Two pilot studies in Costa Rica revealed similar results between experimental conditions. Data for these pilots are available upon request.
17. One might argue that the truly relevant analyses are those that compare the effects of each

experimental condition against a control at high and low levels of a moderator that captures some relevant aspect of individual differences, since, like terror management researchers, we emphasize the importance of worldview and individual coping strategies. The most relevant comparisons are thus those conducted for high-authoritarians in Study 1, participants with low self-esteem in Study 4, and high allocentrics in Study 4. If these are indeed the most important comparisons, then mortality-salience fails to increase intergroup bias in only one of the two Costa Rican studies—participants scoring low on self-esteem in Study 3—and not in both Costa Rican studies as we claim. Using the same criteria, however, social isolation and theft-salience significantly increase intergroup bias in every instance in which the relevant analyses are conducted for each experiment—high authoritarians in Study 1, low self-esteem participants in Study 3, and high allocentrics in Study 4. This suggests that our alternative primes more consistently predict an increase in intergroup bias than does mortality salience across studies.

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