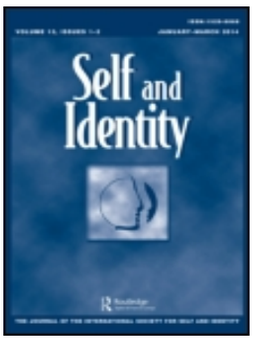

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Mortality Salience Decreases Social Exploration When People Experience Metacognitive Ease Generating Examples of Cultural Value Adherence

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In the present research, we integrated terror management theory with work on metacognitive fluency to examine how mortality concerns affect social exploration motives. We hypothesized that mortality salience would decrease desire to explore novel social interactions only when the feeling of being valued by culturally relevant others was secure. Participants ($N = 328$) reflected on death or physical pain, then generated 3 (metacognitive-ease) or 12 (metacognitive-difficulty) examples of past behaviors that their peers valued (vs. neutral behaviors). Metacognitive fluency was expected to enhance feelings that existing social bonds were secure. Finally, we assessed participants' desire to explore novel social interactions. Death thoughts decreased participants' desire to explore novel social interactions when they experienced "ease" generating examples of culturally valued behavior.

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Whether it is getting to know new co-workers or simply conversing with a stranger on an airplane, modern social life is replete with opportunities to interact with new and unfamiliar others. Despite the commonality of such opportunities, people can at times seem disinclined to seek them out. What motivational and cognitive influences make people reluctant to explore new social contexts and situations? There are no doubt a number of operative factors, but we suggest that the need to manage existential concerns may be a particularly potent motivational piece to this puzzle. According to terror management theory (TMT), cultural belief systems, adherence to accepted cultural values, and close social relationships provide protection against concerns about mortality (see Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). As such, the need to attenuate fears about death is thought to catalyze efforts to affirm the legitimacy of one's cultural beliefs (Schmeichel & Martens, 2005), to strive to live up to the standards of value espoused by one's belief system (Kashima, Halloran, Yuki, & Kashima, 2004), and to maintain social bonds with close others (Mikulincer, Florian, & Hirschberger, 2003). A key implication of this framework is that people may be reluctant to explore novel social relationships when death-concerns are elevated because

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death-concerns trigger a need to cling to existing sources of security (e.g., one's culture and established social bonds). We directly tested this proposal in the present study. Because people cling to the familiarity of their own worldviews in order to manage death concerns, we hypothesized that the activation of death thoughts would inhibit motivation to explore social relationships with new and unfamiliar people. However, we also reasoned that this effect might only occur when people feel that the existing social milieu is an adequate source of security. We integrated TMT with research on metacognitive fluency (Alter & Oppenheimer, 2009) to test this prediction.

Given that the vast majority of TMT research has focused on the ways that reminders of death (mortality salience; MS) compel people to cling to existing beliefs and to become more hostile, intolerant, and unaccepting of people and ideas that differ from those beliefs, it might seem surprising that TMT research has not provided consistent evidence that MS decreases the desire to explore novelty in general, and novel social contexts in particular. Vess, Routledge, Landau, and Arndt (2009), for example, examined how MS and individual differences in need for structure interact to affect people's interest in and willingness to explore novel cultural information. Across two studies, MS increased openness to novelty among people low in need for structure, but had no reliable effect on people high in need for structure. Similarly, across three studies, Routledge and Arndt (2009) found that MS increased exploration motives among participants who engaged in a creative task (vs. a control task) or who were presented with information that creativity was (vs. was not) culturally valued. There was no effect of MS on exploration in the absence of a creativity prime. Moreover, though not a direct test of the effects of MS on novelty exploration per se, Ben-Ari, Findler, and Mikulincer (2002) did report that MS increased participants' willingness to initiate social interactions with a same-sex peer, but that it only did so among people low in self-reported attachment anxiety or avoidance. These studies indicate that death thoughts can *enhance* the general desire to explore novelty among certain people or under certain conditions; however, they provide no evidence that MS promotes a *reluctance* to do so. The only published study to find that MS can undermine exploration motives was provided by Routledge et al. (2010). They found that MS decreased intellectual exploration motives (the desire to explore different beliefs, ideas, or theories) among people low in trait self-esteem, but the desire to explore novel social contexts was not assessed.

Taken together, the above studies indicate that death thoughts do not have consistent negative effects on general exploration motives or the specific motive to explore novel social contexts and relationships. How might we make sense of such findings given one of the central tenants of TMT (i.e., that death thoughts lead people to cling to existing social bonds)? We contend that previous studies have generally failed to detect negative effects of MS on social exploration because they have failed to consider the degree to which people experience existing social relationships as viable sources of security. We propose that the potential effects of MS on reluctance to explore novelty may critically depend on the extent to which people feel confident that others in their existing social milieu value them. This possibility is consistent with some suggestive findings in the literature. Arndt and Greenberg (1999) demonstrated that MS increased the derogation of a target who threatened the specific domain (i.e., academic major) in which participants had previously received a self-esteem boost. In other words, while self-esteem boosts typically mitigate terror management defenses (e.g., Harmon-Jones et al., 1997), MS increased defensiveness (i.e., derogation) toward people who threatened the specific domain upon which heightened feelings of

security were based. A number of findings also indicate that responses to MS can be *directed* by the contextual salience of social norms (Galliott, Stillman, Schmeichel, Maner, & Plant, 2008; Jonas et al., 2008). In one study, MS decreased prosocial intentions when an egoistic norm was contextually activated and increased prosocial intentions when a prosocial norm was contextually activated (Jonas et al., 2008; Study 1). Such findings suggest that responses to MS can be directed by contextual cues of what is a viable source of security (e.g., norms). We thus postulate that previous studies have failed to detect an MS triggered reluctance to explore novel social relationships because they have not considered the contextual salience of existing social relationships as sources of security.

To test this assertion, we drew upon research and theory indicating that the subjective ease or difficulty with which information is brought to mind (i.e., metacognitive fluency) affects judgments and decisions above and beyond the content of that information (e.g., Alter & Oppenheimer, 2009; Schwarz, 2004; Tversky & Kahneman, 1973). For example, in a now classic study (Schwarz et al., 1991), participants recalled either 12 or 6 examples of times when they behaved assertively and subsequently indicated how assertive they believed themselves to be. Because generating 6 examples feels easier than generating 12 examples, participants who generated 6 examples of assertive behaviors perceived themselves to be more assertive than participants who generated 12 examples, even though they generated less information about their assertiveness. The experience of fluency served as a metacognitive cue about how assertive they were. In the current study, we sought to elucidate how death-relevant cognitions affect social exploration as a function of whether or not people feel that existing social contexts are viable sources of existential security. We utilized the metacognitive fluency paradigm to contextually cue people that they were valued in their existing social context, making their existing social bonds viable as terror management defenses. We hypothesized that MS should *reduce* the desire to explore novel social interactions when one's existing social context feels like a viable source of security (i.e., when it feels easy to generate examples of adherence to existing peer norms and values).

Method

Participants

Students ($N = 328$; 214 females) at Ohio University participated for course credit ($M_{age} = 19.06$, $SD_{age} = 1.88$). Participants came to the lab for a study on the "relationship between personality and decisions." In accord with TMT research evidencing the importance of participants being in an experiential mind set (Simon et al., 1997), participants were encouraged not to think too hard about any one particular question and to simply provide their first, gut-level responses. They completed the study in private cubicles on computers.

Procedure and materials

Salience manipulation

After completing two filler personality measures [Neuroticism subscale of the Eysenck Personality Questionnaire (Eysenck, 1967) and the Personal Need for Structure Scale (Neuberg & Newsom, 1993)], participants were randomly assigned to either the MS or pain salience condition. Participants in the MS condition responded to two open-ended questions (Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989): "Please briefly describe the

emotions that the thought of your own death arouses in you" and "Jot down, as specifically as you can, what you think will happen to you physically as you die and once you are physically dead." Participants in the pain salience condition responded to parallel questions about a different aversive topic, physical pain. This manipulation is used frequently in TMT research to differentially activate thoughts of death (see Burke, Martins, & Faucher, 2010).

Mood and distraction

Next, all participants completed a standard measure of state positive and negative affect[1] (PANAS; Watson, Clark, & Tellegen, 1988) and an innocuous word search task. The word search task was included as a distraction exercise to allow thoughts of death to decay from focal attention (see Pyszczynski, Greenberg, & Solomon, 1999).

Metacognitve fluency manipulation

Following the word search task, participants were randomly assigned to generate THREE (ease) or TWELVE (difficulty) examples of times when they did something their university peers valued. We also included a neutral topic condition to ensure that feelings of fluency, in general, do not drive the anticipated results. Thus, depending on condition, participants read:

> We would like you to generate THREE [vs. TWELVE] examples of times when you did something that Ohio University students seem to value (vs. examples of behaviors a person might typically perform in a kitchen). That is, moments when you did something that would make Ohio University students proud (vs. things people would normally do in a kitchen).

Participants then responded to a manipulation check item ("How difficult did you find this task?") on a 1 (*very easy*) to 9 (*very difficult*) scale.

Exploration

Finally, all participants completed the state version (e.g., Routledge & Arndt, 2009; Routledge et al., 2010; Vess et al., 2009) of the Exploration Index (Green & Campbell, 2000). This 18-item scale is comprised of three unique subscales that assess the desire to explore novel environmental (e.g., "I would like to explore someplace that I have never seen before"), intellectual (e.g., "I would like to take a class that is unrelated to my major just because it interests me"), and social (e.g., "I would like to have the chance to meet strangers") experiences. Participants responded to each item using a 1 (*does not describe me at all right now*) to 9 (*very much describes me right now*) scale. We computed separate physical exploration ($M = 6.63$, $SD = 1.53$, $\alpha = .73$), intellectual exploration ($M = 6.03$, $SD = 1.66$, $\alpha = .80$), and social exploration ($M = 5.86$, $SD = 1.64$, $\alpha = .84$) scores by averaging the items for each respective subscale. As previously mentioned, our primary hypothesis focused on social exploration specifically, but the other subscales allowed us to test for a broader effect on exploration.

Results

Manipulation check

We submitted manipulation check scores to a 2 (Salience: MS vs. Pain) × 2 (Metacognitive Fluency: Ease vs. Difficulty) × 2 (Topic: Peer-Valued vs. Neutral) Analysis of Variance (ANOVA). As expected, a main effect of Metacognitive Fluency emerged such that participants found it more difficult to generate 12 examples of behavior ($M = 5.03$, $SD = 2.16$) than three examples ($M = 3.12$, $SD = 2.34$), $F(1, 320) = 72.73$, $p < .001$, $\eta_p^2 = .185$. There was also a main effect

of Topic such that generating examples of peer-valued behaviors ($M = 5.02$, $SD = 2.44$) was more difficult than generating examples of behaviors typically performed in a kitchen ($M = 3.13$, $SD = 2.07$), $F(1, 320) = 70.53$, $p < .001$, $\eta_p^2 = .181$. There was also an unpredicted Salience × Value interaction $F(1, 320) = 4.64$, $p = .032$, $\eta_p^2 = .014$. Participants in the MS condition reported more difficulty generating peer-valued behaviors ($M = 5.39$, $SD = 2.52$) compared to participants in the pain salience condition ($M = 4.65$, $SD = 2.31$), $F(1, 320) = 5.33$, $p = .022$, $\eta_p^2 = .016$. No such relationship emerged for participants generating neutral behaviors, $F(1, 320) = .517$, $p = .473$. While this latter effect was not anticipated, it is important to note that there were no significant Salience × Metacognitive Fluency, Topic × Metacognitive Fluency, or Salience × Metacognitive Fluency × Topic interactions ($ps \geq .194$). This is important because it indicates that the fluency manipulation did not differentially impact fluency as a function of Salience or Topic conditions. Thus, the predicted three-way interaction on social exploration cannot be attributed to a differential impact of the fluency manipulation across Salience and Topic conditions.

Desire to explore novel social interactions/contexts

To test our primary hypothesis, we submitted scores on the social exploration subscale to a 2 (Salience: MS vs. Pain) × 2 (Metacognitive Fluency: Ease vs. Difficulty) × 2 (Topic: Peer-Valued vs. Neutral) ANOVA.[2] A main effect of Topic emerged such that participants who generated examples of behaviors that their fellow students valued showed greater willingness for social exploration ($M = 6.09$, $SD = 1.52$) than participants who generated examples of neutral behaviors ($M = 5.63$, $SD = 1.72$), $F(1, 320) = 6.72$, $p = .010$, $\eta_p^2 = .021$. This effect was qualified by the predicted Salience × Metacognitive Fluency × Topic interaction, $F(1, 320) = 4.39$, $p = .037$, $\eta_p^2 = .014$ (Figure 1).

Follow up tests of the simple, simple main effects were conducted to examine the nature of this three-way interaction. First, within the peer-valued topic condition, MS (vs. pain salience) decreased the desire to explore novel social contexts among participants who experienced metacognitive ease, $F(1, 320) = 4.66$, $p = .032$, $\eta_p^2 = .014$. There was no effect of MS among participants who experienced metacognitive difficulty generating examples of adherence to peer values, $F(1, 320) = .11$, $p = .746$. There were also no effects of MS among participants who experienced ease or difficulty generating examples of behaviors typically performed in a kitchen ($Fs \leq 1.33$, $ps \geq .250$).

Looked at differently, within the MS condition, the experience of metacognitive ease (vs. difficulty) when bringing to mind instances of peer-valued actions lowered participants' willingness to engage in social exploration, $F(1, 320) = 3.87$, $p = .050$, $\eta_p^2 = .012$. This effect of fluency within the MS condition did not emerge among participants who generated examples of behaviors typically performed in the kitchen, $F(1, 320) = 2.61$, $p = .107$. There were also no effects of fluency in either of the topic conditions among participants who reflected on physical pain ($Fs \leq .27$, $ps \geq .601$).

Discussion

The results of this study support the idea that concerns about death can motivate a reluctance to explore novel social contexts and interactions. However, our findings indicate that MS only decreases the desire to explore novel social contexts when people experience the

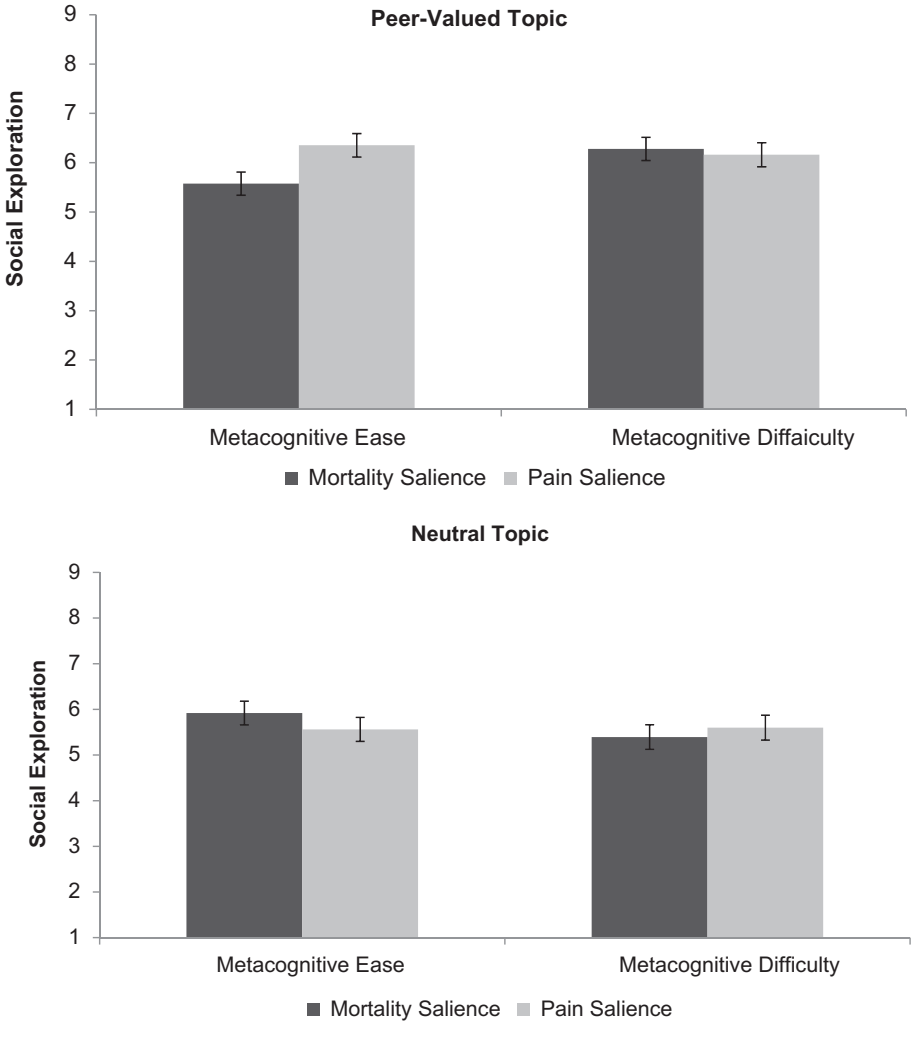

Figure 1. Salience × Metacognitive Fluency × Topic interaction on social exploration.
Note: Higher scores indicate greater levels of social exploration.

feeling that they are successfully behaving in ways that their culturally relevant peers value. This result suggests that the feeling of successful adherence to the values of culturally relevant peers directs people to cling to their existing social contexts when the need to manage concerns about death is elevated. As such, heightened death-concerns appear to make people reluctant to explore novel social interactions when they feel that their existing social bonds are viable sources of protection. These findings thus identify a novel factor that affects how death concerns impact exploration motives and have several implications.

First, the current findings add to the literature examining the ways that mortality concerns affect exploration motives. For example, previous research has found that MS can increase the exploration motives of individuals possessing certain personality profiles associated with openness and security (e.g., low need for structure, Vess et al., 2009; greater attachment security, Ben-Ari et al., 2002) and decrease *intellectual* exploration motives among

people low in self-esteem (Routledge et al., 2010). However, while these studies focused on trait level variables indicative of personal security, our study focused on the operation of a variable (metacognitive fluency) aimed to situationally cue people toward what is a viable source of protection following MS. Our focus on a situational cue of security, rather than a preexisting trait indicative of it, might help explain why we observed a pattern of results discrepant from earlier work (i.e., that heightened security reduces, rather than enhances, exploration). Of course, our specific measure of social exploration motivation may also be distinct from the intellectual exploration scale utilized by Routledge et al. (2010) and the measure of willingness to initiate an interaction with a well-described same-sex peer featured in Ben-Ari et al. (2002). Thus, while our findings are the first to support the hypothesis that metacognitive cues about viable sources of protection direct specific exploration motives following MS, more work is needed to fully understand the nuances that are emerging in this important area of research.

The current research can also be placed alongside other research showing that contextual factors can direct the types of responses that people have to MS inductions. In particular, given the nature of our metacognitive fluency manipulation, one might have predicted that the effects of MS would be dampened by the experience of metacognitive ease when generating examples of cultural value adherence. After all, other TMT research has shown that bolstering self-esteem (Harmon-Jones et al., 1997) and affirming the self (Schmeichel & Marten, 2005) can counteract the need to defensively respond to mortality concerns. Our findings, however, are not consistent with such a prediction. They instead suggest that metacognitive fluency when generating examples of cultural value adherence directs people to be less interested in exploring novel social contexts. This pattern of results aligns with work showing that the contextual activation of social norms (e.g., Jonas et al., 2008) can determine the nature of people's responses to MS by cuing the individual to what is a viable source of protection. This is an important conceptual point in that it distinguishes between factors that *protect* people from mortality concerns and factors that *direct* the defenses that people have to mortality concerns. Our findings suggest that metacognitive experiences might be particularly important for directing TMT responses.

Indeed, our findings indicate that metacognitive experiences (i.e., fluency; Alter & Oppenheimer, 2009) may play an important role in shaping the feeling of cultural value adherence and influencing how willing people are to explore social contexts that may transcend the boundaries of existing cultural bonds (when death is salient). In some ways, such findings make sense given the many ways in which heuristic processes contribute to our understanding and interpretations of the world (Alter & Oppenheimer, 2009). Our findings point out, however, that existential motivations can interact with metacognitive experiences of fluency to affect exploration tendencies – but only when experiences of fluency derive from information that is relevant to terror management functioning (i.e., value adherence). Future research might build from our findings to continue examining how heuristic processes influence the ways that people respond to existential threat. For example, McCabe et al. (2015) found that MS increased nutritional food purchases in a grocery store among individuals who were reminded of mortality and induced to visualize the prototypical healthy eater. The interpretation of these findings is that bringing to mind prototypes cues individuals to what is culturally normative and thus guides people's behaviors and decisions more dramatically when death-concerns are elevated. Our current findings suggest that the experience of metacognitive fluency when generating images of prototypes might increase

the potency of their behavioral effects following MS. At the very least, our findings suggest that the consideration of metacognitive experiences beyond the content of cultural beliefs and values might yield important insights into terror management processes.

There are also some limitations of the current research that should be kept in mind. First, we tailored the content of our metacognitive fluency task to focus specifically on behaviors (cultural value adherence) that were directly relevant to established social bonds. However, it is important to keep in mind that certain groups of people may place differential emphasis on the importance of behaving in ways that are valued by others. Our sample consisted exclusively of college students who, compared to older adults, may have been particularly sensitive to the metacognitive task of generating behaviors that their peers value. Indeed, research has shown that compared to older adults, college students report greater extrinsic motivation for values (Ferssizidis et al., 2010). Future research should assess whether the present effects generalize to populations beyond college-aged adults. A second related limitation is that participants were asked to generate behavioral examples of only one type of value (i.e., behaviors valued by their peers). While we expected that our participants would hold similar values to their university peers, self-determination theory (e.g., Deci & Ryan 2000) clearly asserts the important distinction between adhering to self-determined versus externally determined values. Future research might consider this distinction and explore how the experience of metacognitive fluency, when generating examples of adherence to self-determined values, alters the consequences of mortality salience on exploration and other existentially relevant outcomes (e.g., meaning in life).

In conclusion, while people are presented with myriad opportunities to interact with novel others in their daily lives; they may, under some circumstances, eschew such opportunities. The present research elucidates how cognitive and motivational factors can interact to partially explain this reluctance. Elevated concerns about death combined with subjective feelings of ease recalling behaviors valued by culturally relevant peers dampen people's desire to explore novel social interactions. Thus, when the need to allay existential distress is heightened, people appear reluctant to explore novel social contexts when they feel that they are adhering to the security-providing values of culturally familiar others.

Notes

1. Independent *t*-tests showed that there were no differences in positive or negative affect as a function of salience condition (*p*s > .237).
2. As mentioned, our primary focus was on existing *social* bonds as viable sources of protection and thus social exploration was the critical dependent variable in this study. Nevertheless, the environmental and intellectual exploration subscales were also submitted to identical ANOVAs. No significant effects emerged (*p*s > .122). This pattern of results hints that the primary effects of interest are specific to social exploration, an interpretation that is consistent with our theorizing and makes sense given the social focus of our metacognitive fluency manipulation. However, it is important to note that it is the social nature of our metacognitive fluency condition, rather than metacognitive fluency per se, that is driving this effect. Future research that utilizes a metacognitive fluency induction focused on topics more closely aligned with intellectual or environmental exploration, for example, might detect similar effects on those dimensions.

Disclosure statement

No potential conflict of interest was reported by the authors.

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