

The Divergent Effects of Mortality Salience of Self versus Mortality Salience of a Loved One on Materialistic Consumption

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ABSTRACT:

In the present research, we argue that there are two distinct types of mortality salience, namely mortality salience of self (MSS) which is awareness of one's own death and mortality salience of a loved one (MSLO) which is awareness of the death of a loved one. Studies based on Terror Management Theory have assumed that MSLO individuals' response might follow predictably from the perspective of the theory. However, bereavement studies implied that MSLO individuals may have distinct response in comparison to MSS individuals. In four studies, we tested the convergent versus divergent assumptions and found that MSS and MSLO have divergent effects on materialistic consumption. Specifically, the robustness of the divergence has been tested on product preference for high-status brands, the choice between a materialistic product and an experience, the level of desire for money and the choice between two magazines that highlights different levels of materialistic values. We later proposed that future studies should try to explore the two mechanisms, namely negative emotions and goal orientation that might explain the divergence on materialistic consumption.

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Marketing communications can prompt consumers to contemplate their own death, as well as the death of loved ones. For example, a TV ad of the Heart & Stroke Foundation may remind a viewer of his own mortality if he has a heart condition or of his father's mortality if the father has a heart disease. Past research has largely focused on thoughts about one's own death, which has been termed mortality salience (Greenberg, Solomon, and Pyszczynski 1997). We extend past research by arguing that there are two distinct types of mortality salience, namely mortality salience of self (MSS) which is awareness of one's own death and mortality salience of a loved one (MSLO) which is awareness of the death of a loved one. Studies based on Terror Management Theory (Greenberg, Solomon, and Pyszczynski 1997) have assumed MSLO individuals' response might follow predictably from the perspective of the theory (e.g., Greenberg et al. 1994; Davis & McKearney, 2003; Bonsu and Belk 2003). However, bereavement studies implied that MSLO individuals may have distinct response in comparison to MSS individuals (e.g., Thompson & Janigian 1988). Therefore, to test the convergent and divergent assumptions, we compared the effects of MSS and MSLO on materialistic consumption through four empirical studies in the present research.

Theoretical Background

Terror Management Theory (TMT; Becker 1971, 1973; Greenberg, Solomon, and Pyszczynski 1997) assumes that the awareness of one's own death is a fundamental source of anxiety, and humans have devised two mechanisms, namely worldview validation and self-esteem bolstering that can remove such thoughts from the focus of attention (Greenberg et al., 1997). Cultural worldview refers to shared beliefs about the nature of

reality that provide meaningful explanations of life and the world. Worldview validation suggests that MSS individuals tend to express cultural values and engage in culturally prescribed behavior to buffer the anxiety (Greenberg et al. 1990). Self-esteem has been defined as a person's overall evaluation or appraisal of his or her own worth. Past research suggests that MSS individuals are motivated to bolster their self-esteem (Greenberg et al. 1990, Arndt et al. 2004, Kasser and Sheldon 2000). Because capitalist cultures tout wealth and materialistic consumption as paths to promoting one's self-esteem (Belk & Pollay 1985; Solomon, Greenberg & Pyszczynski 1991), MSS can lead one to lean on materialism as a means of coping with the anxiety. The pro-materialistic behaviour among MSS individuals has been observed in several studies (e.g., Mandel & Heine, 1999; Arndt et al., 2004; Choi, Kwon and Lee, 2007; Kasser & Sheldon, 2000; Sheldon & Kasser, 2008).

Past terror management studies have mostly focused on MSS, with only a few studies having explored the effect of MSLO (Greenberg et al. 1994; Davis & McKearney, 2003; Bonsu and Belk 2003). In these latter studies, it was assumed that MSLO would serve as a reminder of an individual's own mortality, thus MSLO individuals' response might follow predictably from the perspective of TMT. This theoretical assumption is supported by Death-Thought Accessibility studies in terror management research (e.g., Mikulincer et al. 2002; Mikulincer & Florian 2000). Death-thought accessibility measures the activation level of one's death concerns, which enables researchers' inferences on the working of the anxiety buffering mechanism. Past research has demonstrated that MSS leads to high levels of death-thought accessibility, which is consistent with the assumptions of terror management theory (e.g., Arndt et al. 1997; Arndt et al. 1998). Past research also demonstrated that MSLO leads to elevated death-thought accessibility as well. For example, it has been demonstrated that MSLO regarding one's infant, a romantic partner or other security-providing attachment figure could increase death-thought accessibility (Taubman-Ben-Ari & Katz-Ben-Ami 2008, Mikulincer, Florian & Hirschberger 2003). Therefore, both MSS and MSLO were found to elevate death-thought accessibility. Terror management theory implies

that death-thought accessibility mediates, or at least partially mediates, the effects of MSS such as increased engagement of cultural behavior or elevated desire on materialistic possession (Arndt et al. 1997). Several studies have empirically tested and supported the mediating role of death-thought accessibility on the effects of MSS (Vail et al. 2010; Hayes et al 2010). However, no study has verified the mediating effect of death-thought accessibility in the MSLO condition, so there is no evidence showing that MSLO individual's elevated death-thought accessibility may also lead to the same effects as MSS, such as on materialistic consumption.

Moreover, studies have shown that simply applying terror management theory to explain the effects of MSLO might not be in itself sufficient, which challenges the inference on the convergent effects of MSS and MSLO on materialistic consumption. For example, Greenberg et al. (1994) found that compared to a control condition of no mortality salience, both MSS and MSLO increase an individual's defense of their cultural worldviews, yet, MSS participants exhibited a significantly greater defense than MSLO participants. In addition, Liu and Aaker (2007) found that unlike MSS participants, when MSLO participants were asked to think about the hypothetical death of a close friend, only a small percentage (9%) of them expressed anxiety and fear over their own deaths. Therefore, the effect of MSLO might not altogether lend itself to terror management explanations.

Furthermore, bereavement studies imply that MSLO may result in less interest in materialistic consumption, which yields divergent results in comparison to the effect of MSS. Bereavement studies have revealed that after losing a loved one, the bereaved are more inclined to pursue intrinsic goals, including a greater appreciation of life, better relationships with others and a more conscious development of personal strengths (Niederland & Sholevar 1981; Tedeschi & Calhoun 1996; Thompson 1985; Thompson & Janigian 1988). Although MSLO rests on counterfactual thoughts concerning a loved one's death, we believe it might lead to similar goal endorsement and consumption behaviour

due to our capacity for self-reflection, temporal associations, and symbolic thought (Deacon, 1997). Hence, it is possible that MSLO individuals may also focus more on pursuing intrinsic goals. Past research has revealed that intrinsic and extrinsic goal content forms a bi-polar dimension (Ryan & Deci 2000; Grouzet et al. 2005), so the lack of compatibility between intrinsic and extrinsic goals suggests that MSLO individuals may become less overt in materialistic consumption. Therefore, MSS and MSLO may lead to divergent results regarding their effects on materialistic consumption. However, MSS has also been found to promote intrinsic goal endorsement, such as greater investment in close relationships (Mikulincer et al. 2002), an increased desire to have children (Zhou, Lei, Marley, & Chen, 2009) or to affiliate with others (Taubman-Ben-Ari, Findler & Mikulincer, 2002). Thus, the divergent argument is also not beyond challenge.

In sum, there is no consistent theoretical argument, nor is there clear empirical evidence, to demonstrate whether MSS and MSLO will have the same effects on materialistic consumption or not. In the following sections, four studies were designed and conducted to empirically investigate this question.

Study 1

Study 1 partially replicated Mandel & Heine's (1999) study on the effect of MSS on the preference of high-status products which has been used as an indication of materialistic consumption (e.g., Van Boven 2005).

Design & Procedure

One hundred and twenty two undergraduate students from a Canadian university participated in the study for a chance to win an iPod. The cover story described the study as a survey on the effects of emotion and personality on college student's brand attitude. Participants were invited to a computer lab where they answered an online questionnaire.

To correspond with the cover story, the first session of the questionnaire included filler questions from the big five personality test (John, Donahue, and Kentle 1991). After answering the filler questions, participants were randomly assigned to one of the three conditions: control, MSS or MSLO. In the control condition, participants responded to two open-ended questions that were not related to death: (a) *“Please briefly describe the emotions that the thought of visiting the dentist awakens in you”* and (b) *“Describe, as specifically as you can, what you think will happen to you the next time you undergo a painful procedure at the dentist’s office”*. These two manipulation questions for control participants have been used often in terror management research (e.g., Greenberg et al. 1997). In the MSS condition, participants responded to two open-ended questions used in previous mortality salience research (e.g., Arndt et al. 2004): (a) *“Please briefly describe the emotions that the thought of your own death awakens in you”* and (b) *“Describe, as specifically as you can, what you think will happen to you as you physically die and once you are physically dead.”* Participants in the MSLO condition were first asked to think of a deeply loved parent and then to indicate, using seven-point Likert scales, how important and close this parent was to them. Then they were asked to respond to two similar open-ended questions adapted from Greenberg et al. (1994): (a) *“Please briefly describe the emotions that the thought of this loved one’s death arouses in you,”* and (b) *“Describe, as specifically as you can, what you think will happen to this loved one as he or she dies, and once he or she has died.”* The manipulation questions for MSLO participants were adapted from the first study in the article by Greenberg et al. (1994). This manipulation procedure was adopted in the following studies, and is not described in detail hereafter. All participants then completed the Positive and Negative Affect Scale (PANAS) for mood (Watson, Clark, and Tellegen 1988), followed by a filler anagram task. This filler task was introduced between the manipulation and brand preference task in accordance with prior mortality salience research which found mortality salience manipulations to be more effective after a delay (Arndt et al. 2004).

In the second part of the experiment, participants were asked to rate product advertisement on high-status and low-status products. The presentation of the product's advertising was counterbalanced. Based on our pre-tests on a different college student sample, high-status products comprised Rolex watches and BMWs, whereas low-status products included KIA automobiles and Pringles. The dependent variable of materialistic consumption was measured jointly by brand attitude and purchase intent (Mandel and Heine 1999). Brand attitude was measured by a single item scale: "To what extent do you like the product in the advertisement?" Purchase intent was measured by a three-item scale: (1) "After reading the advertisement, how possible is it that you will buy the product in the future?" (2) "After reading the advertisement, how likely is it that you will buy the product in the future?" and (3) "After reading the advertisement, how probable is it that you will buy the product in the future?" Participants indicated their answers on a seven-point Likert scale (1=not at all / 7=very much). Participant's brand preference was calculated by averaging the scores from each of the four items ($\alpha=.79$). As the participants were college students, they were told to assume for all the questions that they had graduated from college and were earning a comfortable salary. Thus, they could afford any of the items, though acquiring them would likely involve having to forego other purchases. After rating product advertisements, participants reported their general level of self-esteem which acted as a control variable in the later data analysis.

Results

Manipulation check: The average degree of closeness and significance of parents to the participants was 6.2 (S.D. =.94) and 6.6 (S.D. =.78) respectively. The results were similar to those in the following studies; therefore, we won't discuss it hereafter. With regard to the products' status, all participants perceived BMW automobiles (M=6.4, S.D. =0.64) and Rolex watches (M=6.1, S.D. =.82) as high-status products, whereas KIA automobiles (M=3.3,

S.D. =1.4) and Pringles (M=3.0, S.D. =1.2) as low-status objects. These manipulation-check results were consistent with our pre-test results concerning product status.

Product preference: The MANOVA test on high-status products (Rolex watches and BMWs) revealed significant treatment effects (Hotelling's Trace=.08, $F(1, 121)=2.32$, $p=.05$). ANOVA shows that the death-thought manipulation has a significant effect on consumer preferences for BMWs ($F(2, 120)=4.06$, $p<.05$) and a marginal effect on Rolex watches ($F(2, 120)=2.84$, $p<.10$). Pair-wise comparisons showed that MSLO participants (Mrolex=2.5, S.D.=1.1; Mbmw=3.8, S.D.=1.2) had significantly lower degrees of preference for luxury products than MSS participants (Mrolex=3.6, S.D.=1.2, $p<.05$; Mbmw=5.2, S.D.= 1.3, $p<.05$). However, MSLO participants didn't differ significantly from control participants (Mrolex=3.0, S.D.=1.2 $p>.10$; Mbmw=4.4, S.D.=1.3, $p>.10$) in terms of their preferences for luxury products. The study also partially replicates Mandel and Heine's (1999) findings on the effect of MSS, in that MSS promotes pro-materialistic behavior in comparison to the control condition, although the effects are not as significant ($p<.10$). As for the preference towards low-status products, the MANOVA test on KIAs and Pringles revealed no significant treatment effects (Hotelling's Trace=.03, $F(1, 121)=.92$, $p=.45$). ANOVA shows no significant treatment effect on KIAs ($F(2, 120)=.33$, $p>.50$) and Pringles ($F(2, 118)=.56$, $p>.05$). Pair-wise comparisons showed no significant difference between these conditions ($P>.40$). Overall, the results from study 1 showed that MSLO and MSS have divergent effects on participant's intention of materialistic consumption.

Mood effects: ANOVA on PANAS items revealed insignificant treatment effects on negative affects and positive affects ($p>.30$). Specifically, there is also no significant treatment effect on PANAS items related to emotional distress (i.e., nervous, scared, distressed and afraid). However, there is a marginal effect on "upset" ($p<.10$). We later conducted a study that ruled out the effect of "upset" on the dependent variables. These results suggest that varying states of mood did not account for the effects of MSS and MSLO on product

preference. The results on mood effects were replicated in the following studies; therefore, we won't discuss it hereafter.

Study 2

The results from study 1 revealed the divergent effect of MSS and MSLO on materialistic consumption. Study 2 was designed to test the effect through a budget allowance task.

Design & Procedure

One hundred and fifty seven undergraduate students in three introductory marketing classes in a Canadian university participated in the study to obtain half course credit. The study was disguised to understand how college students' discretionary spending was influenced by emotional considerations. Participants were randomly assigned to one of the three conditions: control, MSS or MSLO, as in study 1. After answering two corresponding open-ended manipulation questions, participants in each condition rated their emotions, measured by the PANAS, and finished a filler task on finding a path through a maze. They were then asked to answer questions regarding their budget allowances. This task was adopted and revised from Van Boven (2005)'s study. First participants were asked to give answers with respect to spending \$500 on a materialistic product and an experience. Specifically, the questions were: "A: *Imagine you have a \$500 shopping budget to buy yourself a materialistic product. When consuming a materialistic product, you will end up with something tangible that you can keep and show to others. Please indicate which materialistic product you would buy,*" and "B: *Imagine you have a \$500 shopping budget to buy yourself an experience-related product. When consuming an experience-related product, you will not end up with anything tangible, e.g. something you can hold in your hand; instead, you will have only your memories. Please indicate which experience-related product you would buy.*" Then participants were asked, "Now imagine you have \$500 and are asked to make a decision on spending the

shopping money on either A or B. Please indicate your choice.” The order of questions A and B was counterbalanced. In the end, participants reported their general level of self-esteem which acted as a control variable in the later data analysis.

Results

We conducted a chi-square test on participants’ choice between the materialistic product versus the experience. The results revealed that 8% of MSLO participants chose the materialistic product over the experience, while 37% of MSS participants and 39% of control participants signalled their preference for the materialistic choice (Pearson chi-square = 15.01, d.f.=2, p=.001). The results showed no significant difference between the MSS and the control participants regarding the choice of materialistic product (Pearson chi-square=.098, d.f.=1, p=.75). Thus, the results suggest that MSS participants were more likely to conduct pro-materialistic consumptions than MSLO participants. Overall, the results indicate the divergent effects of MSS and MSLO on materialistic consumption again.

Study 3

The results from study 1& 2 revealed the divergent effect of MSS and MSLO on materialistic consumption. Study 3 was designed to test the effect through participant’s desire for money which is a manifestation of one’s materialism value (Kasser 2002).

Design & Procedure

Three hundred and fifty college students participated in a study disguised as a personality test for a chance to win an iPod nano. After answering filler questions on personality, they were randomly assigned to one of the three conditions: control, MSS or MSLO. After answering two corresponding open-ended manipulation questions, participants in each condition rated their emotions, measured by the PANAS, and finished a filler anagram task. They were then asked to perform several tasks that were used to measure

the desire for money. Specifically, the desire for money was measured in two ways. First, participants were asked to identify, out of five Canadian coins (¢1, ¢5, ¢25, \$1 and \$2) the actual coin size among a set of seven coin sizes (ranging from 92.5% to 107.5% of the actual size). Past research has shown that a bigger coin size indicates a stronger desire for money (Bruner and Goodman 1947; Zhou, Vohs and Baumeister 2009). This measurement approach is still well accepted (e.g., Zhou et al. 2009; Briers et al. 2005). Second, participants were given a list of eight pleasant things, e.g., sunshine, spring, chocolate etc., and asked how many of them they would be willing to forego permanently in exchange for two million dollars (Zhou and Gao 2008). This approach is adopted from the studies of Zhou et al. (2009). In the end, participants filled out the Duke-UNC Functional Social Support Perception questionnaire (Broadhead et al. 1988). Previous research has revealed that social support is negatively associated with the desire for money (e.g. Zhou & Gao 2008; Mikulincer & Shaver 2008), so in this study, we checked our participants' perception of social support as a control variable.

Results

ANOVA tests revealed a significant treatment effect on the sum of estimated coin sizes ($F(2, 347)=3.12, p<.05$) and the number of things to forego ($F(2, 347)=3.72, p<.05$). The two measures on the desire of money were significantly inter-correlated ($r=.33$), which is consistent with the experiment design assumption that they all measure the same variable. Pair-wise comparisons showed that the effect was driven by the significant differences between MSLO ($M_{\text{coin}}=4.61, S.D. =.133; M_{\text{forego}}=1.46, S.D. =1.46$) and MSS participants ($M_{\text{coin}}=4.66, S.D.=.134, p<.05; M_{\text{forego}}=1.97, S.D.=1.51, p<.01$), and MSS and control participants ($M_{\text{coin}}=4.62, S.D.=.132, p<.05; M_{\text{forego}}=1.66, S.D.=1.25, p<.10$). No significant difference was found between MSLO and control participants on desire for money ($p<.30$). Thus, study 3 showed that MSS participants have significantly higher desire for money in

comparison to MSLO participants. Overall, the results also demonstrated the divergent effects between MSS and MSLO on materialistic consumption.

Study 4

The results from study 1, 2 and 3 revealed the divergent effect of MSS and MSLO on materialistic consumption. Study 4 was designed to test the effect through participant's choice between two magazines that highlight materialistic and non-materialistic value respectively.

Design & Procedure

Two hundred and one college students from a Canadian university participated in a study disguised as a personality test in exchange of half course credit. After answering filler questions on personality, they were randomly assigned to one of the three conditions: control, MSS or MSLO. After answering two corresponding open-ended manipulation questions, participants in each condition rated their emotions, and finished a filler anagram task. They were then given a seemingly irrelevant survey which said "*our school library has gotten multiple copies of the following recent issues of the magazines. It intends to give it away to our students. Please indicate which one you will like to receive (if there is still some copy left).*" Participants then indicated their choice between *Money* and *Canadian Family*. Based on our pre-tests on a different college student sample, these two magazines highlight materialistic and non-materialistic value respectively.

Results

We conducted a chi-square test on participants' choice between the two magazines. The results revealed that 40% of MSLO participants chose *Money* over *Canadian Family*, while 62% of MSS participants and 52% of control participants signalled their preference for *Money* (Pearson chi-square =6.61, d.f.=2, p=.03). The results showed significant difference between

MSLO and MSS participants regarding the choice of magazine (Pearson chi-square=6.60, d.f.=1, $p=.01$). Thus, the results suggest that MSS participants were more likely to favour a magazine that highlights materialistic value in comparison to MSLO participants. Overall, the results indicate the divergent effects of MSS and MSLO on a choice related to materialistic value.

Discussion

The present research differentiates between two types of mortality salience (i.e., MSS and MSLO) and shows that they can have divergent effects on materialistic consumption. Through four studies, we have tested the robustness of the divergence across different measures of the dependent variable. Specifically, we found that MSS and MSLO had divergent effects on the product preference for high-status brands, the choice preference between a materialistic product and an experience, the level of desire for money and the choice preference between two magazines that highlights different levels of materialistic value. The present research contributes to the literature of mortality salience by distinguishing for the first time between two types of mortality salience. Past research on mortality salience generally assumed that MSLO was equivalent to MSS, thus MSLO and MSS influence consumer behaviour in a similar manner (Greenberg et al. 1994; Bonsu and Belk 2003). We show in the present research that this assumption doesn't always hold, at least on materialistic consumption, MSS and MSLO can have distinguished effects.

The research results may provide useful implication for consumers on how to control materialistic consumption. Materialism has become a widely accepted societal value (Kasser, 2002). An expanding literature suggests that the adoption of materialistic values can have a plethora of negative psychological, health and financial consequences for individuals, families and society (Kasser, 2002). Social scientists have argued that materialism crowds out social relationships (Kasser, 2002; Fournier & Richins, 1991), thereby detracting from social engagement (Putnam, 2000) and diminishing personal well-being (Burroughs & Rindfliesch,

2002). Therefore, materialism, as an extrinsically oriented value, is viewed as fundamentally incapable of providing true and deep connections to one's core being. As a result, being materialistic cannot satisfy higher-order intrinsic needs such as love and belonging. Consistent with past terror management studies, our research reveal that the thought of one's own death will promote materialistic consumption. Moreover, this research also demonstrates that the thought of a loved one's death will diminish the desire for materialistic possessions. Thus, the findings of this research provide an effective self-control tactic for consumers tempted by materialistic consumption in that thinking of the unavoidable loss of a loved one through death might weaken the urge to own a materialistic possession in order to manifest one's status and esteem. Meanwhile, this research shows that the thought of a loved one's death can also promote consumption of experiential goods rather than materialistic products, which may in turn lead people to view themselves in a more favourable light. Van Boden and Gilovich (2003) argued that experiential goods might be effective in fulfilling one's intrinsic needs and constructing the self, as experiences are more central to one's identity. As a result, consumption of experiences will help preserve and enhance one's subjective well-being.

Explanations of the divergence

The present research has demonstrated the divergent effects of MSS and MSLO on materialistic consumption. The results support the value of further work on understanding the mediating mechanism. The explanations of the divergence may arise from two mechanisms, namely negative emotions and goal orientation.

1. Negative Emotions

Negative emotions evoked by MSS and MSLO might be a potential mechanism underlying the divergent effect on materialistic consumption. This view was suggested by results from a content analysis of data that we had collected earlier in other research projects on mortality salience. In these previous projects, we had analyzed MSS and MSLO

participants' written answers to the mortality salience manipulation questions. In total, written answers from 707 participants were analyzed. 219 out of 350 MSS participants mentioned fear (e.g., afraid, scary, terrified, fear) and 65 mentioned sadness (e.g., depressing, sadness, upset). In contrast, 315 out of 357 MSLO participants mentioned sadness and 43 mentioned fear. These results indicate that fear may be the dominant emotion for MSS individuals which is consistent with TMT, whereas sadness may be the dominant emotion for MSLO individuals. Further, it is possible that these negative emotions of fear and sadness can drive the divergent results of MSS versus MSLO on materialistic consumption.

First consider fear evoked by MSS. It is possible that fear can lead to MSS individuals' preference for materialistic consumption. The meaning structure underlying fear is defined by high uncertainty over an outcome and low control over a situation (Frijda, Kuipers, and Ter Shure 1989). For example, when thinking of their own death, individuals experience anxiety towards their unavoidable and uncontrollable impending mortality (Greenberg et al. 1997). Raghunathan and Pham (1999) suggested that fear motivates individuals to reduce the sense of uncertainty and regain the sense of control. In modern materialistic societies, materialistic consumption such as owning status possessions can provide a sense of control, stability and continuity in an otherwise less stable existence (Vinsel et al. 1981). As a result, fear might drive MSS individuals to be more in favour of materialistic consumption.

Next consider sadness evoked by MSLO. It is possible that sadness can drive MSLO individuals to be less in favour of materialistic consumption. The meaning structure underlying sadness is defined by the loss or absence of a cherished object or person (Lazarus 1991). For example, an individual can experience sadness for days, months or even years from losing a loved one (Harvey 1998). Raghunathan and Pham (1999) suggested sadness motivates individual to seek pleasurable stimuli as a suitable replacement or compensation for the loss. Materialistic consumption is less likely to remind people of the experience and

pleasure shared with their loved ones (Van Boven 2005). As a result, sadness might drive MSLO individuals to prefer less of materialistic consumption. As indicated in study 2 and study 4, MSLO participants prefer experience or family bonding to materialistic consumption or value.

Past research has shown that as a coping strategy, MSS individuals tend to remove thoughts of death from their immediate consciousness (Greenberg et al. 1994). As a result, fear evoked by MSS could be at MSS individuals' subconscious mind (Arndt et al. 2004). Under this circumstance, self-report measures of emotion used in my four studies cannot accurately reflect individuals' emotional reactions to mortality salience manipulation. Thus, to test the mediating effect of negative emotions on the divergence, future research may have to measure MSS and MSLO participants' emotions based on brain states such as electroencephalography and neuroimaging.

2. Goal Orientation

An alternative explanation of the divergence may be goal orientation. It could be that MSS individuals have relatively more extrinsic goal orientation whereas MSLO individuals have relatively more intrinsic goal orientation. For example, Sheldon & Kasser (2008) found that MSS individuals put greater emphasis on extrinsic goals. Specifically, in their studies, MSS and control participants were asked to freely list five salient personal goals (Emmons 1989). They were asked to rate on a 1 (no help) to 5 (considerable help) scale on how helpful each of their five goals would be in reaching each of three intrinsic (self-acceptance, affiliation, and communal acceptance) and three extrinsic (financial success, attractive appearance, and social popularity) future goals. The study showed that MSS participants listed goals more strongly linked to extrinsic compared to intrinsic future than control participants. Therefore, MSS individuals' more extrinsic goal orientation may explain their pro-materialism behaviour as shown in the previous studies (e.g., Mandel & Heine 1999; Arndt et al. 2004; Choi, Kwon and Lee 2007) and the present research.

Past research implied that MSLO individuals may put greater emphasis on intrinsic goals. For example, bereavement studies have revealed that after losing a loved one, the bereaved are more inclined to pursue intrinsic goals, including a greater appreciation of life, better relationships with others and a more conscious development of personal strengths (Niederland & Sholevar 1981; Tedeschi & Calhoun 1996; Thompson & Janigian 1988). Studies have shown that the need to belong, or the desire for interpersonal attachment, is a fundamental human motivation as well as an important component of psychological development and emotional equanimity (Bowlby, 1969, 1982; Baumeister & Leary, 1995). MSLO may make the corresponding intrinsic goals associated with the loved one to be more salient, such as affiliation, bonding, and mutual understanding. Since intrinsic and extrinsic goals are not compatible (Ryan & Deci 2000; Grouzet et al. 2005), MSLO individuals' more intrinsic goal orientation may explain their less interest in materialistic consumption as shown in the present research.

Limitations & Future Research

There are several limitations of the present research that should be pointed out. First, in manipulating mortality salience, we adopted only one method in the present research, namely asking participants two open-ended questions regarding either their own death or the death of a loved one. Past research has applied other methods to manipulate MSS, such as exposing participants to gory video scenes, death-priming news or fear of death inventories, or interviewing participants in front of a funeral home (Greenberg et al. 1994). As to our knowledge, past research has only used open-ended questions approach to manipulate MSLO (e.g., Greenberg et al. 1994). An alternative method to manipulate MSS and MSLO could involve asking participants to fill out the Collett-Lester fear of death (Collett & Lester 1969) sub-scale on death of self or death of a loved one respectively. The underlying logic of this manipulation approach is that the sub-scales can activate participants' thoughts related to MSS or MSLO accordingly. Future research could try to

adopt this manipulation method to check the robustness of our research findings in the present research.

Second, we manipulated MSLO using only one method in all our studies. Specifically, in MSLO condition, college students were asked to answer questions regarding the counterfactual death of a loved parent. Thus MSLO only referred to parental loss among relatively young student respondents. In his attachment theory, Bowlby (1973) claimed that a child's attachment to a caregiver (e.g., a parent) is instinctive; hence the loss of a parent terminates the financial, emotional and instrumental support for the child. In comparison with parental loss, loss of other significant family members during adulthood, such as spouses, siblings or children, might not always lead to the same consequences (Harvey 1998; Genevro, Marshall, and Miller 2004). Hence, future research could assess the effect of MSLO on other family members rather than just parents.

Third, consistent with prior studies on mortality salience, the participants in our studies were college students, which might limit the generalization of the results to the broader population. On average, college students are still in their youth so they might be less concerned about their own death compared with an older population (Martens et al. 2004). Furthermore, they have less experience of losing a loved one through death in their lives compared to an older population (Harvey 1998). As a result, for college students, MSS and MSLO might activate the concept of death as more temporally distant concerns in its connection to themselves and to their loved ones. Hence, future research could provide a valuable service by recruiting participants from different age groups to examine how the divergent effect of MSS and MSLO differ as a function of age or past experience.

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