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Prosocial Attitudes toward Money from Terror Management Perspective: Death Transcendence through Spirituality

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ABSTRACT

Based on Terror Management Theory (TMT), we suggest that spirituality and prosocial attitudes toward money have a similar defensive function in resisting existential anxiety. In mortality salient (MS) situations, both spirituality and prosocial money attitudes afford symbolic immortality by self-transcendent connections. In four studies, we found that activating death awareness weakened people’s subjective love of money (Study 1) and predicted increased spending willingness on prosocial rather than proself goals (Studies 2, 3, and 4). More importantly, MS effects on money attitudes were smaller when people’s trait spirituality was high (vs. low; Studies 1, 2, 3) and when people were primed to experience spirituality (vs. happiness control condition; Study 4). For low spirituality people, the association between MS and prosocial spending also depended on the capacity of money spending to contribute positively to one’s feelings of self-worth (Study 3). Theoretical implications and future directions are discussed.

Death is an inescapable fate for all human beings. Terror Management Theory (TMT; Solomon, Greenberg, & Pyszczynski, 1991) posits that personal awareness of one’s own mortality prompts existential anxiety, leading people to support values that are consistent with their own cultural worldviews (Burke, Martens, & Faucher, 2010; Greenberg, Solomon, & Pyszczynski, 1997). Amongst the psychological mechanisms to protect the self against the awareness of death, religion and supernatural beliefs have long been considered as effective means to ward off existential anxiety (Norenzayan & Hansen, 2006; Vail et al., 2010). Although many nonreligious people—particularly Atheists—reject ideas of the supernatural (Vail, Arndt, & Abdollahi, 2012), the personal experience of, and spiritual connection with, the sacred is a universal phenomenon in everyday life (Preston, Ritter, & Hernandez, 2010; Seidlitz et al., 2002; Zinnbauer & Pargament, 2005; Zinnbauer et al., 1997).

Incorporating the belief in, and bonding with, transcendent power (Saroglou, 2011), spirituality is prevalent in both religious and nonreligious populations and reflects self-transcendence beyond religious affiliations (Preston & Shin, 2016). However, studies have rarely examined the potential function of spirituality when death thoughts are accessible. Based on the defensive roles of religious and supernatural beliefs in MS situations, we propose that spirituality also helps people, including nonreligious people, ward off threats of death awareness and attenuate other practical cultural worldview expressions such as prosocial behavior (Jonas, Schimel, Greenberg, & Pyszczynski, 2002; Zaleskiewicz Gasiorkowska, & Kesebir, 2015). A recent investigation by Piotrowski, Żemojtel-Piotrowska, and Clinton (2018) provides
preliminary support for our proposition by showing that spiritual transcendence reduced the effect of mortality salience on increased altruistic tendencies for both religious and nonreligious people.

In four studies sampling from non-WEIRD (that is, not as Western, Educated, Industrialized, Rich, and Democratic; Henrich, Heine, & Norenzayan, 2010) and largely nonreligious (Dong, Wu, Zhu, Jin, & Zhang, 2017) populations from China, we aim to make a novel contribution by investigating how spirituality would moderate MS effects on people’s prosocial attitudes toward money. We examine spirituality and prosocial attitudes toward money as two complementary self-transcendent worldview defenses, and hypothesize that spirituality, as a culturally universal (Dong et al., 2017) and religiosity-independent (Zinnbauer & Pargament, 2005) construct, shields against death anxiety, thereby decreasing the need for alternative cultural defensive mechanisms such as prosocial attitudes toward money. In the following, we first review the literature on (a) mortality salience and prosocial attitudes toward money and (b) mortality salience and spirituality. After that, we theoretically integrate these domains and introduce the current research.

**Mortality salience and prosocial attitudes toward money**

As a worldview expression, prosocial behavior plays an essential part in resisting existential anxiety. The Scrooge effect of MS reveals that when death thoughts are salient, people are more prosocial and generous in social interactions (Jonas et al., 2002; Zaleskiewicz et al., 2015). Reminders of mortality intensify people’s willingness to make donations (Jonas et al., 2002, Study 2; Zaleskiewicz et al., 2015, Study 3) and causes people to share more money with their anonymous partners in dictator and ultimatum games (Zaleskiewicz et al., 2015, Studies 1 and 2). Although people often behave prosocially by giving valuable resources (e.g., money) to others, relatively few empirical studies have specifically addressed people’s attitudes toward money, and spending intentions, in the context of mortality salience.

Based on findings of the Scrooge effect, we infer that people show heightened prosocial attitudes toward money when mortality is salient; however, besides generosity MS can also lead to greed. TMT studies of materialism suggest that MS could strengthen personal desire to accumulate wealth and spend money on personal goals (Arndt, Solomon, Kasser, & Sheldon, 2004; Kasser & Sheldon, 2000). Both proself and prosocial attitudes toward money have been found as possible reactions to MS. In the current research, we address how MS influences money spending if people can choose how to allocate their money to both proself and prosocial goals. We presume that although people sometimes increase their spending on proself goals in MS situations, particularly spending money on prosocial goals is susceptible to MS. This is because prosociality implies the pursuit of positive interpersonal connections with others, and social defenses to death thoughts driven by our predisposition to affiliate and connect with others are more compelling and effective than personal defenses when mortality is salient (Jonas et al., 2014). While people can affirm their threatened self-worth by either self-enhancement (e.g., achievement) or self-transcendent (e.g., prosociality) values, upholding self-transcendent cultural values is more effective in soothing self-threats (Burson, Crocker, & Mischkowski, 2012).

**Mortality salience and spirituality**

From the perspective of TMT, religious and supernatural beliefs both serve an existential function to manage death anxiety (Jonas & Fischer, 2006; Norenzayan & Hansen, 2006; Vail et al., 2010). MS induces stronger religious beliefs; furthermore, challenging religious beliefs (for example, presenting inconsistencies in the Bible or presenting support for evolutionary theory in a sample of religious people) intensifies death-related thoughts (Friedman & Rholes, 2007; Schimel, Hayes, Williams, & Jahrig, 2007).

Although belief in supernatural phenomena is often considered as a defensive mechanism against death awareness, existing literature typically neglected the insight that the experience of the divine is not necessarily restricted to religious people (Preston & Shin, 2016; Saroglou, 2011). Spirituality beyond religiousness is experienced in everyday life when, for example, people are reminded of the
concept of the divine (Gervais & Norenzayan, 2012; Laurin, Kay, & Fitzsimons, 2011), face vast stimuli (e.g., nature; Piff, Dietze, Feinberg, Stancato, & Keltner, 2015), or experience self-transcendent emotions (e.g., awe; Van Cappellen, Saroglou, Iweins, Piovesana, & Fredrickson, 2013). In the present research, we operationalize the concept of spirituality to extensively represent the personal experience of, and connection with, the sacred (Preston et al., 2010; Seidlitzl et al., 2002; Zinnbauer & Pargament, 2005; Zinnbauer et al., 1997), and examine its defensive function against MS in general population samples (instead of excluding nonreligious people; e.g., Schumann, McGregor, Nash, & Ross, 2014).

We propose that spirituality should function as a defensive mechanism against MS, therefore mitigating other defensive reactions (i.e., prosocial attitudes toward money in the present research) for both religious and nonreligious people. Both spirituality and prosocial money attitudes afford symbolic immortality by self-transcendent connections. While the expression of prosocial money attitudes strengthens interpersonal connection with others (Jonas et al., 2014, 2002), spirituality helps people connect with a larger sacred reality by transcending concerns of the individual self and affiliated social groups (Piedmont, 1999; Piff et al., 2015; Van Cappellen et al., 2013).

As a defensive mechanism in terror management, spirituality is different from religious beliefs and religious affiliations. Religious belief may mitigate death anxiety by promising an afterlife and literal immortality (Dechesne et al., 2003; Vail et al., 2010), while many nonreligious people—particularly Atheists—reject ideas of an afterlife (Norenzayan & Hansen, 2006; Vail et al., 2012). Religious affiliations may be based on ingroup favoritism and outgroup hostility (Ginges, Hansen, & Norenzayan, 2009; Preston & Ritter, 2013; Vail et al., 2012); spirituality, however, is uniquely connected with unboundedly transcendent feeling of compassion (Saslow et al., 2013), value of universalism (Saroglou & Galand, 2004), belief in ultimate justice (Dong et al., 2017), and prosocial behavior toward general but not close others (Preston & Ritter, 2013). Therefore, spirituality provides people with a broader frame of personal meaning-making, and helps people obtain symbolic immortality through connecting self-worth with transcendence (Piedmont, 1999; Piff et al., 2015; Van Cappellen et al., 2013).

Overview of the present research

In the present research, we examine (a) how people perceive, and spend, money in MS conditions and (b) to what extent these MS effects on money attitudes are moderated by spirituality. We focus primarily on abstract love of money (Study 1) and money spending intentions on proself versus prosocial goals (Studies 2 to 4). Based on our line of reasoning, we predict that (a) mortality salience will reduce love of money, and increase money spending on prosocial goals. Moreover, we hypothesize that (b) these MS effects on money attitudes will be attenuated among high spirituality participants. In addition to the main hypotheses, we empirically address the implications of feelings of self-worth in prosocial spending when mortality is salient in Study 3.

We examined the two main hypotheses in four consecutive studies. In all studies, we experimentally manipulated mortality salience. Furthermore, we measured spirituality as an individual difference variable in Studies 1 through 3, while we experimentally manipulated the experience of spirituality in Study 4. To vary the conceptualization of money attitudes, we measured individuals’ love of money as the dependent variable in Study 1 while assessing spending intentions on proself and prosocial life aspects in Studies 2 to 4. We sampled from diverse groups of people (college students as well as online adults) across studies to avoid convergent values of money in a homogeneous population. To investigate the specific moderating effect of spirituality independent of religiosity, we sampled from a general population that mainly consisted of nonreligious people and controlled for religiosity across all the four studies.

Study 1: Love of money

In Study 1, we tested how mortality salience would influence subjective love of money at various levels of trait spirituality. Although money substantially represented prosocial reactions to mortality salience in previous studies (Jonas et al., 2002; Piff et al., 2015), few explicitly addressed attitudes toward money in
TMT studies. We deem love of money as an overall indicator of proself versus prosocial money attitudes since it is both positively related to self-oriented behavior (e.g., power abuse) and negatively related to other-oriented behavior (e.g., organizational commitment; Tang & Chiu, 2003).

Method

Participants
We recruited 150 participants on the Chinese online investigation platform Sojump and rewarded each participant with ¥10 payment. Across the four studies, we consistently inserted one attention check question in the questionnaire (“Please choose strongly disagree when you see this item”) to select eligible participants for further analyses. We excluded 19 subjects who did not choose the required answer in Study 1, suggesting that they did not read the question carefully. The remaining 131 subjects (73 male, 58 female; 28 religious and 103 nonreligious people) had an average age of 32.0 years old (SD = 5.6).

Materials and procedure
Participants first completed basic demographic information and the Spiritual Transcendence Index as an individual difference indicator of spirituality. They then were randomly assigned to different MS conditions, doing a questionnaire concerning fear of death (vs. fear of dental pain), followed by distraction tasks for about 3 minutes. Finally, participants responded to the Love of Money Scale to assess their attitudes toward money.

The Spiritual Transcendence Index (STI; Seidlitz et al., 2002) assesses spirituality using eight items on a six-point scale (ranging from 1 = strongly disagree to 6 = strongly agree; e.g., “God helps me to rise above my immediate circumstances”). To ensure the applicability of STI in nonreligious populations, following the procedure by Underwood and Teresi (2002), we clarified the meaning of “God” as a general concept regardless of religious background by stating: “The expression of ‘God’ is representative of some extensive, self-transcendent higher power, which could be replaced by your own expression if you’re not used to it.” The Cronbach’s α for the STI was 0.83 in the current study. The eight items were averaged together as a composite index of spirituality.

Fear of death questionnaire vs. dental pain questionnaire. Participants were randomly assigned to either the mortality salience (n = 69) or the control condition (n = 62), completing a 15-item questionnaire concerning fear of death (e.g., “I am very much afraid to die”) or fear of dental pain (e.g., “I am very much afraid of dental work”), respectively to activate death thoughts or dental pain thoughts.

Distraction tasks. Following the MS manipulation, all participants completed the Positive-Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988; Cronbach’s α = 0.79 for positive affect and α = 0.91 for negative affect) and the Behavioral Identification Form (BIF; Vallacher & Wegner, 1989) as distraction tasks to push death thoughts out of focal consciousness (Pyszczynski, Greenberg, & Solomon, 1999).

Love of money scale (LOMS; TANG & CHIU, 2003). LOMS includes 17 items in total (α = 0.89), which can be further categorized into four distinctive factors: importance (e.g., “Money is an important factor in the lives of all of us”; α = 0.82), success (e.g., “money represents my achievement”; α = 0.75), motivator (e.g., “I am motivated to work hard for money”; α = 0.74), and rich (e.g., “Having a lot of money is good”; α = 0.77), revealing different aspects of people’s love of money. Given the high reliability of the general scale and the substantial inter-correlations between the LOMS subscales (as shown in Table 1), we aggregated the four subscales and averaged the 17 items as in Tang and Chiu (2003), to capture people’s general attitude toward money.
Results and discussion

Affect

No differences were found between the MS and control conditions in either positive affect, \( t(129) = -0.41, p = 0.68 \), or negative affect, \( t(129) = -0.27, p = 0.79 \), which indicates that the effects of the MS manipulation are not attributable to emotions.

Attitudes toward money

We examined the effects of MS and spirituality on people’s general love of money (\( M = 4.74, SD = 0.51 \) for all the 17 items) with (a) the control variables sex, age, family income, and religiosity (i.e., whether the person is religious or not), (b) the effect-coded mortality salience conditions (\(-1 = \) control condition, \( 1 = \) mortality salience) and mean-centered score of the STI scale (\( M = 4.29, SD = 0.71 \)), and (c) their interaction entered into the regression equation successively.

After controlling for the effects of sex (female = -1, male = 1; \( B = -0.08, SE = 0.05, p = 0.10 \)), age (\( B = 0.01, SE = 0.01, p = 0.11 \)), family income (\( B < 0.001, SE < 0.001, p = 0.63 \)), and religiosity (non-religious = -1, religious = 1; \( B = 0.01, SE = 0.06, p = 0.83 \)), both MS (\( M_{\text{mortality}} = 4.83, SD = 0.49 \) versus \( M_{\text{control}} = 4.86, SD = 0.51 \); \( B = -0.10, SE = 0.05, t = -2.05, p = 0.04, \eta^2_p = 0.032, 95\% CI [-0.19, -0.003] \)) and the MS by spirituality interaction (\( B = 0.14, SE = 0.06, t = 2.19, p = 0.03, \eta^2_p = 0.038, 95\% CI [0.01, 0.26] \)) predicted people’s love of money, while spirituality was not a significant predictor (\( B = -0.03, SE = 0.07, t = -0.41, p = 0.68, 95\% CI [-0.16, 0.11] \)). We performed a power analysis using G*power software (Faul, Erdfelder, Lang, & Buchner, 2009) to calculate the achieved power for the current linear multiple regressions. The sample size of 131 participants, at an alpha level of 0.05, yielded 62% power for detecting the observed interaction effect (\( \eta^2_p = 0.038, f^2 = 0.040 \)).

We subsequently conducted Simple Slope Analyses to further examine the effects of death priming on attitudes toward money on higher (+1 SD) and lower (-1 SD) levels of spirituality respectively. As shown in Figure 1, low spirituality participants valued money less in the MS compared to the control condition (\( B = -0.23, SE = 0.08, t = -3.00, p = 0.003, \eta^2_p = 0.068, 95\% CI [-0.39, -0.08] \)), while attitudes toward money did not differ between the MS versus control conditions for high spirituality participants (\( B = 0.04, SE = 0.08, t = 0.54, p = 0.59, 95\% CI [-0.11, 0.20] \)). Together, MS exerted a stronger effect on attitudes toward money among participants low as opposed to high on spirituality.

Discussion

With love of money as a general indicator of attitudes toward money, results in Study 1 supported our hypothesis that spirituality moderates the influence of mortality salience on attitudes toward money. MS decreased love of money among participants low but not high on spirituality. Although love of money overall suggests high prosel and low prosocial money attitudes (Tang & Chiu, 2003), the reduced love of money might be insufficiently diagnostic of increased prosociality as reaction to MS. An alternative interpretation of the MS effect on the reduced love of money might be that mortality salience reduces people’s general favorability of money, decreasing both prosel and prosocial money attitudes. To exclude this possibility, we addressed people’s prosocial (vs. prosel) money attitudes directly in the following studies.

Table 1. Means, standard deviations, and correlations of main the continuous variables (Study 1).

|                  | M (SD) | 1 | 2 | 3 |
|------------------|--------|---|---|---|
| 1 Money is important | 4.88 (0.59) |   |   |   |
| 2 Money represents success | 4.31 (0.70) | 0.35*** |   |   |
| 3 Money is a motivator | 4.81 (0.62) | 0.59*** | 0.48*** |   |
| 4 I want to be rich | 4.90 (0.64) | 0.73*** | 0.37*** | 0.63*** |

Note. ***p < 0.001.
Study 2: Proself versus prosocial spending

In Study 2, we expand on Study 1 by operationalizing attitudes toward money as spending behavior. With consumption being a major function of money in contemporary society, spending could be categorized according to different goals, notably proself versus prosocial spending. Both these aspects of spending were suggested as potential reactions to MS (e.g., Arndt et al., 2004; Jonas et al., 2002).

In Study 2, we therefore incorporated both of these spending aspects and tested participants’ willingness to allocate money to personal versus prosocial goals as a function of MS and spirituality. Based on the results of Study 1, which revealed that MS reduced personal love of money, we predicted that MS would strengthen willingness to allocate money on prosocial rather than proself goals, and that this effect would be more salient for low spirituality people.

Method

Participants
We recruited 79 college students (15 male, 64 female; 15 religious people, 64 nonreligious people) of a large university in China via online advertisement on a campus forum. Students (Mage = 20.4, SD = 2.9) were appointed to participate in our laboratory experiment and to fill out a paper-and-pencil questionnaire in individual cubicles. They were each given ¥15 as monetary reward upon completion. In addition to Study 1’s attention check question, across Studies 2 to 4, the z-scores of spending amount were checked concerning the wide variation in the indicated amount of money spending. We would only include participants whose indicated amount of spending was within three standard deviations of the mean. Applying these criteria, no participant was excluded from the analyses in Study 2. Although our sample admittedly is on the low side (an issue we address in Studies 3 and 4), we consider it acceptable for the present purposes.

Materials and procedure
Participants were randomly assigned to complete one of the two versions of the questionnaire (differing in MS conditions). After the basic demographics, measures were presented in the following sequence.

Figure 1. The interaction of mortality salience by spirituality on the love of money scale (LOMS) in Study 1.
Four-item scale of spirituality. Spirituality was measured with a shorter four-item scale extracted from Stillman, Fincham, Vohs, Lambert, and Phillips (2012): “I feel God’s presence,” “I experience a connection to all life,” “I feel a selfless caring for others,” and “I feel deep inner peace or harmony.” Researchers suggested that these items were applicable for both religious and nonreligious people and were sensitive to both Eastern and Western traditions (Stillman et al., 2012). Ratings ranged from 1 (Not at all true of me) to 6 (Very true of me), and the internal consistency of the scale was acceptable (α = 0.70).

Mortality salience manipulation. Following the spirituality scale, Study 2 adopted another widely accepted manipulation to vary death awareness in a laboratory situation (Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). The MS condition (n = 40) asked participants to “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 happens to you as you physically die.” In the control condition (n = 39), we asked participants to answer the same two questions about dental pain.

Distraction tasks. The PANAS and BIF were again presented as distraction tasks.

Spending money on personal vs. prosocial goals. We modified the procedure developed by Dunn, Aknin, and Norton (2008), asking undergraduate students to indicate how much money they would be willing to spend in a typical month on (a) bills and expenses, (b) gifts for themselves, (c) gifts for others, and (d) donation to charity, after they obtained employment for five years. The first two categories were summed to create an index of personal spending (M = ¥3747.67, SD = ¥3315.31), while the latter two were summed as an index of prosocial spending (M = ¥1167.41, SD = ¥1102.64).

Results and discussion

Affect. Consistent with previous MS research (e.g., Vail et al., 2012; Zaleskiewicz et al., 2015), the MS and control groups did not significantly differ in positive affect, t (77) = 1.22, p = 0.23, or negative affect, t (77) = −1.67, p = 0.10.

Spending intentions

We performed hierarchical regression analyses for spending intentions on personal and prosocial goals respectively, in which (a) the control variables sex (−1 = female, 1 = male), age, family income, and religiosity (−1 = nonreligious, 1 = religious), (b) the effect-coded mortality salience conditions (−1 = control condition, 1 = mortality salience) and the mean-centered measure of spirituality (M = 2.88, SD = 0.91), and (c) their interaction were entered into the regression equation in three steps.

For personal spending, while sex (B = 58.08, SE = 485.16, p = 0.91), age (B = 78.89, SE = 136.54, p = 0.57) and religiosity (B = 445.57, SE = 477.87, p = 0.35) did not significantly predict personal expenses, the influence of family income was significant (B = 679.92, SE = 325.32, t = 2.09, p = 0.04, ηp² = 0.056, 95% CI [31.71, 1328.12]). However, none of the effects of MS (B = 151.44, SE = 382.44, t = 0.40, p = 0.69, 95% CI [−610.95, 913.82]), spirituality (B = −376.91, SE = 453.44, t = −0.83, p = 0.41, 95% CI [−1280.82, 527.00]), or their interaction (B = −470.42, SE = 431.75, t = −1.09, p = 0.28, 95% CI [−1331.30, 390.46]) were predictors for personal monetary spending.

In contrast, for prosocial spending, after controlling for the non-significant predictors of sex (B = −79.86, SE = 165.80, p = 0.63), age (B = 39.47, SE = 46.67, p = 0.40), family income (B = −146.15, SE = 112.63, p = 0.20), and religiosity (B = −24.58, SE = 163.41, p = 0.88), the interaction of MS by spirituality marginally predicted attitudes toward prosocial spending (B = −275.41, SE = 142.79, t = −1.93, p = 0.06, ηp² = 0.066, 95% CI [−560.20, 9.36]), even though the main effects of neither MS (B = 67.92, SE = 129.29, t = 0.53, p = 0.60, 95% CI [−189.87, 325.71]) nor spirituality (B = −235.34, SE = 152.87, t = −1.54, p = 0.13, 95% CI [−540.16, 69.47]) were significant. A power analysis suggested that our sample of 79 participants yielded 64% power to
detect the interaction effect ($\eta p^2 = 0.066$, $f^2 = 0.07$) at an alpha level of 0.05. As shown in Figure 2, for low spirituality participants ($-1$ SD), MS marginally reinforced their intentions to spend prosocially ($B = 329.48$, $SE = 185.71$, $t = 1.77$, $p = 0.08$, $\eta p^2 = 0.043$, 95% CI $[-40.92, 699.87]$), while this effect was not observed for high spirituality participants ($+1$ SD; $B = -171.76$, $SE = 177.60$, $t = -0.98$, $p = 0.33$, 95% CI $[-525.97, 182.45]$).

**Discussion**

These results suggest that among low spirituality participants, MS reinforced a willingness to spend on prosocial but not personal goals. The results extend the findings of Study 1, which revealed that MS weakened personal love of money by illuminating the implications for money spending behavior. The findings are restricted, however, by the somewhat marginal effects in conjunction with the relatively small sample size. We therefore will further test MS effects on prosocial spending goals and the moderation of spirituality with somewhat bigger samples in Studies 3 and 4.

**Study 3: Social contexts and prosocial donations**

In Study 3, we seek to replicate the effects of MS and trait spirituality on prosocial spending in Study 2 with typical donation scenarios. We presume that mortality salience would increase donations to charity among participants low but not high on spirituality.

Furthermore, Study 3 provides an extension of Studies 1 and 2 by investigating when and why mortality salience increases prosocial spending. We presume that whether MS encourages prosocial or proself attitudes toward money depends on the norms salient in the situation (Jonas, Sullivan, & Greenberg, 2013). People adhere to prosocial values more when the norm of prosociality is salient rather than not because upholding the salient norm(s) can boost their self-esteem in self-threat situations (Gailliot, Stillman, Schmeichel, Maner, & Plant, 2008). People also rely on cultural worldview defenses to attain their positive self-worth (Rosenblatt et al., 1989); therefore, although people choose prosocial over proself goals in MS situations, they may vary their contribution to prosociality depending on whether such contribution effectively affirms their positive feelings of self-worth. To address the varying capacity of prosocial spending to affirm a positive self-worth, Study 3 used different social comparison contexts where one’s prosocial behavior was either superior or inferior.

![Figure 2. The interaction of mortality salience by spirituality on prosocial spending (Unit: Chinese Yuan) in Studies 2 and 3.](image-url)
to others. We presume that MS should exert a bigger influence on people’s prosocial spending when their generosity added to their positive self-worth by exceeding the generosity of others.

Method

Participants
One-hundred and fifty participants were recruited on the Chinese online surveying platform Sojump. Applying the same standards as in Study 2, seven participants (four with the attention check and three with the amount of spending) were excluded from further analyses. The final sample thus included 143 subjects (97 males, 46 females; 27 religious people and 116 non-religious people), $M_{age} = 32.5$ years ($SD = 6.5$).

Design and procedure
Study 3 had a 2 (mortality salience) × 2 (donation context) factorial design. We included spirituality as a continuous independent variable and the amount of prosocial donations as the dependent variable. Participants were randomly assigned to the four conditions. They first completed the spirituality scale and were subjected to the randomly distributed mortality salience manipulation. After the completion of PANAS and BIF, participants were randomly assigned to one of the two donation contexts. Following this manipulation, participants indicated the amount of money they would like to donate in two scenarios, and filled out some demographic information.

Materials
Measurement of spirituality and mortality salience manipulation. In Study 3, we again used the four-item scale of spirituality as in Study 2 ($\alpha = 0.64$ in the present study) and the MS manipulation of Study 1 ($n = 69$ in the MS condition and $n = 74$ in the control condition).

Context manipulation and prosocial donating measures. In this part of the questionnaire, participants read a cover story about the donating scenarios as a marketing survey for an online donation app. After a paragraph of background information, the manipulation of situational contexts was presented by stating: “Previous survey has demonstrated that the amount of donations interacts between different individuals. Your donation may impact others’ decision. For example, when you donated ¥10, others who saw your amount of donations would donate ¥20 on average” (self-inferiority condition; $n = 73$). In contrast, the self-superiority condition ($n = 70$) stated: “...when you donated ¥10, others who saw your amount of donations would donate ¥5 on average.” We presume that people would show more prosocial spending intentions in the self-superior (compared to the self-inferior) context where their generosity exceeded that of others and effectively affirmed their feelings of self-worth. After this manipulation, two charity scenarios, one raising money for an emergent surgery and one for rural teaching volunteers, were presented in a randomized order. Participants indicated how much money they would be willing to donate for each cause, and the two indicators of donating amount were averaged to create an index of prosocial spending.

Results and discussion

Affect
In the final sample of 143 participants, the MS and control groups did not differ in either positive affect, $t (141) = −0.86, p = 0.39$, or negative affect, $t (141) = −0.42, p = 0.67$.

Prosocial donations
We conducted hierarchical linear regressions with the control variables (sex, age, family income, and religiosity), the effect-coded death manipulation (control = −1, death = 1), donation context (self-superiority = −1, self-inferiority = 1) and mean-centered spirituality ($M = 4.16, SD = 0.79$) as independent variables, and prosocial donations as the dependent variable ($M = ¥293.87, SD = 290.59$; as shown in
The two-way interaction of MS and spirituality was significant \((B = -87.01, SE = 31.42, t = -2.77, p = 0.006, \eta^2 = 0.055, 95\%CI [-149.17, -24.85]; \text{achieved power} = 82\%)\). As shown in Figure 2, results were consistent with Studies 1 and 2 in that for low spirituality participants \((-1 SD\)}, MS considerably boosted prosocial spending \((B = 75.68, SE = 34.84, t = 2.17, p = 0.03, \eta^2 = 0.035, 95\%CI [6.76, 144.60]\)), while this effect displayed an opposite trend for high spirituality participants \((+1 SD; B = -57.55, SE = 34.16, t = -1.69, p = 0.09, 95\%CI [-125.12, 10.03]\). The three-way interaction of MS, spirituality and donation context was marginally significant \((B = 55.36, SE = 31.18, t = 1.78, p = 0.08, \eta^2 = 0.023, 95\%CI [-6.31, 117.04]\)). Therefore, we analyzed how spirituality and mortality salience influenced prosocial spending within the two donation contexts, including sex, age, family income, and religiosity as covariates in all the following analyses.

Of particular relevance to our line of reasoning, in the self-superiority context, the interaction between spirituality and MS was significant \((B = -145.21, SE = 48.33, t = -3.01, p = 0.004, \eta^2 = 0.127, 95\%CI [-241.81, -48.61]\), achieved power = 88% with a sample size of \(n = 70\) in the self-superiority context), while neither the main effect of MS \((B = 12.61, SE = 41.19, t = 0.31, p = 0.76, 95\%CI [-69.70, 94.91]\}) nor of spirituality \((B = -6.79, SE = 53.11, t = -0.13, p = 0.90, 95\%CI [-112.93, 99.34]\}) was significant. More precisely, for low spirituality participants \((-1 SD\)}, MS positively predicted prosocial spending \((B = 121.76, SE = 53.14, t = 2.29, p = 0.025, \eta^2 = 0.078, 95\%CI [15.53, 227.99]\}). For high spirituality participants \((+1 SD\)}, however, the association between MS and prosocial donations was non-significant, although we note that there was an unexpected reversed trend \((B = -107.68, SE = 55.74, t = -1.93, p = 0.06, \eta^2 = 0.057, 95\%CI [-241.81, 48.61]\)).

In the self-inferiority condition, we did not find a significant effect of mortality salience \((B = -6.88, SE = 28.78, t = -0.24, p = 0.81, 95\%CI [-64.35, 50.59]\}) or a MS \times spirituality interaction \((B = -22.48, SE = 38.23, t = -0.56, p = 0.56, 95\%CI [-98.82, 53.87]\). Only spirituality was a significant predictor of prosocial spending \((B = 110.86, SE = 38.40, t = 2.89, p = 0.005, \eta^2 = 0.112, 95\%CI [34.20, 187.53]\}). Together, spirituality moderated the MS effect on the amount of donations, while such moderation effect was stronger when the donations contributed positively to one’s self-worth (i.e., the self-superior context) than when the donations contributed negatively to one’s self-worth (i.e., the self-inferior context).

**Discussion**

Consistent with the former experiments, the significant MS \times spirituality two-way interaction revealed that mortality salience only exerted an effect on prosocial money attitudes among low spirituality participants. At high levels of spirituality, mortality salience did not influence participants’ prosocial spending.

Furthermore, Study 3 induced different social contexts to examine the self-worth striving implications of prosocial spending as a MS defense. We found that the social comparative contexts of

| Table 2. Hierarchical regressions of mortality salience, spirituality, donation context and their interactions on prosocial donations (Study 3). |
|---|
| Variables | \(R^2\) | \(\Delta R^2\) | \(B\) | \(SE\) | \(t\) | Lower | Upper |
|---|
| Model 1 | Sex | 0.03 | 0.03 | 29.85 | 26.67 | 1.12 | -22.9 | 82.6 |
| | Age | -6.05 | 3.83 | -1.58 | -13.6 | 1.5 |
| | Family income | 0.001 | 0.001 | 0.58 | -0.002 | 0.003 |
| | Religiosity | -10.70 | 31.48 | -0.34 | -72.95 | 51.55 |
| Model 2 | MS | 0.05 | 0.03 | 8.45 | 24.83 | 0.34 | -40.7 | 57.6 |
| | Context | -33.34 | 24.88 | -1.34 | -82.6 | 15.9 |
| | Spirituality | 46.67 | 32.84 | 1.42 | -18.3 | 111.6 |
| Model 3 | MS \times Context | 0.12 | 0.07 | -5.70 | 24.42 | -0.23 | -54.0 | 42.6 |
| | MS \times Spirituality | -87.01 | 31.42 | -2.77** | -149.2 | -24.9 |
| | Context \times Spirituality | 46.91 | 30.94 | 1.52 | -14.3 | 108.1 |
| Model 4 | MS \times Spirituality \times Context | 0.14 | 0.02 | 55.36 | 31.18 | 1.77 | -6.3 | 117.0 |

Note. 1.\(p < 0.10\), **\(p < 0.01\). 2.Sex: female = -1, male = 1; Religiosity: non-religious = -1, religious = 1.
prosocial spending marginally influenced how spirituality moderated the MS effect on prosocial spending. As predicted, low spirituality participants in the MS situation indicated to donate more money as compared to the control condition when they thought their generosity would be superior to others and hence reflect positively on their self-worth; however, when the context implied that their generosity would be inferior to others (i.e., their self-worth was not affirmed), spirituality did not moderate the MS effect on prosocial spending.

Different from previous studies, we found a marginal trend in Study 3 that high spirituality participants intended to donate more in the control than the mortality salient condition, qualified by both the two-way interaction between MS and spirituality and their two-way interaction in the self-superior context. This trend may be attributed to the general relationship between spirituality and prosocial tendencies, including helping, donating, and volunteering (Dong et al., 2017; Galen, 2012). Supporting this proposition, we found a strong positive spirituality-prosociality association in the control ($B = 144.92$, $SE = 50.72$, $t = 2.86$, $p = 0.006$, $\eta^2_p = 0.107$) but not in the mortality salient ($B = −29.00$, $SE = 41.68$, $p = 0.48$) condition, which might also contribute to the strong main effect of spirituality on prosocial spending in the self-inferior context. In situations where one’s generosity positively influences others’ generosity, people are more motivated to spend prosocially when they are high rather than low on spirituality.

**Study 4: Primed spirituality**

Studies 1 to 3 established that trait spirituality moderates the MS effects on prosocial money attitudes. A drawback of the studies, however, is that they did not establish a causal effect of spirituality. Spirituality can both be a stable trait (Piedmont, 1999) and a situational experience (Preston & Shin, 2016). Therefore, we primed situational spirituality with a recalling-and-writing task in Study 4, in which participants wrote about spiritual (priming condition) versus happy (control condition) experiences. We presume that prosocial spending intentions of spirituality-primed participants would be less susceptible to death reminders, compared with those in the happiness condition. We used happiness as a comparison condition to spirituality, as spirituality shares the emotional positivity with happiness but uniquely contributes to self-transcendence.

We also developed a haze-priming-death paradigm in Study 4 to examine a different manipulation of death thoughts and its impact on prosocial money spending. Researchers argued that among people who had no near-death experiences, common MS manipulation might elicit abstract thoughts rather than concrete experiences (Cozzolino, Staples, Meyers, & Samboceti, 2004). Haze, as an ordinary experience for most of our sampled participants (Chinese people), is a concrete death reminder that is prevalent on social media and environmental reports.

**Method**

**Participants**

After the experimenter’s general introduction, 145 undergraduate students (34 males, 111 females; 12 religious people, 133 non-religious people) completed a paper-and-pencil questionnaire during an introductory psychology class. Their mean age was $M = 20.2$ years ($SD = 2.3$). No participant failed the two screening criteria applied in Studies 2 and 3. Different from the previous studies, we primed spirituality with a recalling task. To guarantee the effectiveness of the recalling task, we instructed participants to write at least three lines and accordingly excluded 10 participants who did not comply with the instruction.

**Design and procedure**

Study 4 was a 2 (mortality salience) × 2 (spirituality) factorial design. Four different versions of the questionnaire (representing the four conditions) were randomly distributed to students in class. In serial order, participants completed our manipulations of death awareness and spirituality activation,
and then indicated their spending intentions respectively on prosocial and prosel life aspects. We again asked about both prosel and prosocial money attitudes as in Study 2, to exclude the possibility that priming happiness may induce a salient norm of hedonism, thus increasing prosel spending (Jonas et al., 2013).

Materials

Concrete mortality salience. In Study 4, we adopted two self-developed news reports entitled “Haze threatens human health and causes death” versus “College students face great pressure and a difficult employment situation,” to induce the MS and control conditions respectively. Participants were asked to help us evaluate newspaper reports that would be used in other research projects. In the MS condition \( (n = 70) \), participants read a scientific article describing the devastating impact of air pollution and haze-caused mortality rate of some diseases. In the control condition \( (n = 65) \), participants (who were all college students) read a brief comment showing the increasingly difficult employment prospects of college graduates and complaints about college students’ deficiency in practical working skills. As in previous studies, participants rated the PANAS as a filler task. At the end of the PANAS, we inserted three questions in both the MS conditions as manipulation check for our MS materials. Participants rated “I feel close to death,” “I am not reminded of death at all,” and “I am very much afraid of death” on a 6-point scale (\( \alpha = 0.55 \)).

Priming of situational spirituality. In this section, participants were randomly assigned to read a paragraph about spirituality versus happiness. In the spirituality-priming condition \( (n = 71) \), they were presented with the following instruction: “Spirituality is a feeling of transcending the reality or individual self. In different times, it could be experiences in the form of God’s presence, connection to all life, a selfless caring for others, or deep inner peace or harmony.” We integrated the four-item scale of spirituality (Stillman et al., 2012), which we used as a measure of spirituality in Studies 2 and 3, to compose this introductory paragraph and ensure the conceptual consistency of spirituality in the present research. In contrast, a similar paragraph depicting happiness (“Happiness is a pleasurable experience or a state of well-being. In different times, it could be experienced in the forms of joyful mindset, positive attitudes, feeling of excitement or just being energetic”) was presented in the happiness control condition \( (n = 64) \). Participants were then asked to write their personal experiences relevant to the description. This recalling-and-writing paradigm to prime situational spirituality was also used in Stillman et al. (2012, Study 2).

Spending money on personal vs. prosocial goals. We measured money attitudes as in Study 2 with a minor modification. To better control the effect of family income on spending intentions (Study 1 found a significant effect of family income on prosel spending), we provided a fixed standard and required participants to reflect how much money they would like to allocate on the four categories when they expected a ¥5000 monthly income. The ¥5000 is just a standard of living and may not be exhaustively spent on the listed categories. The four blanks were similarly calculated as personal spending \( (M = ¥3304.81, SD = 904.38) \) and prosocial spending \( (M = ¥1056.19, SD = 586.33) \).

Results and discussion

Manipulation check of MS materials

To first establish the effectiveness of our MS manipulation, we conducted a 2 (mortality salience) × 2 (spirituality) ANOVA with the average score of the three manipulation check questions as the dependent variable. We found that only the main effect of MS \( (F (1, 131) = 6.03, p = 0.02, \eta^2 = 0.044) \) was significant, while neither the main effect of spirituality \( (F (1, 131) = 2.18, p = 0.14) \) nor the two-way interaction \( (F (1, 131) = 0.69, p = 0.41) \) was significant, which indicates that only the MS manipulation influenced mortality thoughts.
**Spending on personal vs.
prosocial goals**

We conducted a hierarchical regression analysis with (a) control variables including sex, age, and religiosity, (b) the MS and spirituality manipulation (MS and spirituality priming = 1, control conditions = −1), and (c) the two-way interaction entered in three steps to evaluate their associations with prosocial versus personal spending intentions. The descriptive statistics in each condition are presented in [Table 3](#). Given that participants estimated their expenses based on a certain amount of income (i.e., ¥5000), the regression models did not include family income as covariate.

With respect to personal spending, when sex (\(B = -60.66, SE = 96.69, p = 0.53\)), age (\(B = -28.27, SE = 34.27, p = 0.41\)), and religiosity (\(B = 64.97, SE = 143.47, p = 0.65\)) were controlled, only spirituality marginally predicted willingness to spend on personal goals (\(B = 137.51, SE = 78.43, t = 1.75, p = 0.08, \eta^2 = 0.023, 95\%CI [-17.67, 292.68]\)), while the effects of MS (\(B = -18.24, SE = 78.82, t = -0.23, p = 0.82, 95\%CI [-174.18, 137.70]\)) and the interaction (\(B = 17.81, SE = 79.27, t = 0.23, p = 0.82, 95\%CI [-139.04, 174.67]\)) were not significant.

We then analyzed prosocial spending. After controlling for sex (\(B = 79.42, SE = 62.40, p = 0.21\)), age (\(B = -7.95, SE = 22.17, p = 0.72\)), and religiosity (\(B = 99.16, SE = 92.59, p = 0.29\)), although the main effects were not significant (MS: \(B = 53.09, SE = 51.36, t = 1.03, p = 0.30, 95\%CI [-48.54, 154.71]\); spirituality: \(B = -34.54, SE = 51.07, t = -0.68, p = 0.50, 95\%CI [-92.50, 23.41]\)), the two-way interaction was significant (\(B = -112.31, SE = 50.63, t = -2.22, p = 0.03, \eta^2 = 0.037, 95\%CI [-212.49, -12.13]\), achieved power = 62%). For participants in the spirituality priming condition, MS did not influence prosocial spending when compared with the control condition (\(B = -61.27, SE = 64.72, t = -0.95, p = 0.35, 95\%CI [-190.49, 67.96]\)); however, MS positively predicted prosocial spending among participants in the happy control condition (\(B = 166.31, SE = 81.28, t = 2.05, p = 0.05, \eta^2 = 0.067, 95\%CI [3.62, 329.00]\)).

**Discussion**

Results in Study 4 replicated the moderating role of spirituality in MS effects on prosocial but not proself spending intentions. Moreover, Study 4 extended the previous findings by examining the causal effects of spirituality. When situational spirituality was not primed, MS increased prosocial spending intentions. However, when spirituality was situationally primed, people no longer increased their prosociality as a defensive mechanism against MS.

**General discussion**

Although spirituality and self-transcendent experiences are universal phenomena in general populations (Saroglou, 2011; Van Cappellen et al., 2013), spirituality has rarely been addressed in terms of its function in MS situations. We reasoned that independent of religion and supernatural beliefs, both of which have been established as effective MS defenses (e.g., Jonas & Fischer, 2006; Norenzayan & Hansen, 2006; Vail et al., 2010), spirituality would also help to shield against death-related thoughts and mitigate other mundane worldview defenses like prosocial attitudes toward money.

Across four studies, we found support for our hypothesis that spirituality would moderate MS effects on attitudes toward money. In Study 1, MS suppressed personal love of money among people low on spirituality, and this effect was non-significant among people high on spirituality. Similarly in Studies 2

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**Table 3.** Means and standard deviations of personal and prosocial spending (unit: Chinese Yuan) in different mortality salience and spirituality conditions (Study 4).

|                          | Mortality Salience Condition | Control Condition |
|--------------------------|------------------------------|-------------------|
|                          | M    | SD   | M    | SD   |
| **Prosocial Spending**   |      |      |      |      |
| Spirituality             | 974.57 | 528.83 | 1060.00 | 527.09 |
| Happiness                | 1250.00 | 624.25 | 922.76 | 643.75 |
| **Personal Spending**    |      |      |      |      |
| Spirituality             | 3407.14 | 921.00 | 3450.00 | 712.44 |
| Happiness                | 3125.71 | 873.16 | 3217.24 | 1111.64 |
and 3, spirituality moderated the effects of MS on increased prosocial spending intentions. The effects of MS on prosocial spending intentions were significant only among low spirituality participants and non-significant among high spirituality participants. In Study 4, an experimental manipulation of spirituality also caused decreased prosocial spending following MS, as compared to a happiness control condition. Despite the trend of nontheistic spirituality in contemporary society (Saroglou, 2011; Zinnbauer & Pargament, 2005), the psychological function of spirituality has typically been examined among religious people and in Western societies. Sampling from general populations of Easterners in which the vast majority was nonreligious (83.4% altogether in the four studies), we established that spirituality also played a protective role against death anxiety. Across all four studies, the effects of spirituality were examined while controlling for religiosity (i.e., whether or not the participants are religious), which underscored the unique role of spirituality independent of religiosity. The present findings suggest that feelings of transcendence are not exclusive to religious people, and that such feelings may be conducive in managing death awareness independent of religious beliefs and identities.

Additionally, we replicated and extended the Scrooge effect of mortality salience regarding money attitudes specifically. The Scrooge effect of MS revealed a prosocial inclination in social interactions after a death reminder (e.g., Jonas et al., 2002; Zaleskiewicz et al., 2015), and the present findings extend this line of research by revealing similar effects on direct attitudes toward money. Concerning another line of research demonstrating that people would become greedier and spend money on self-serving goals (e.g., Arndt et al., 2004; Kasser & Sheldon, 2000), our results incorporated both prosocial and proself aspects of spending and further lent support to the Scrooge effect that prosocial (instead of proself) spending is a primary method to cope with existential anxiety. Although people generally allocate more money to proself rather than prosocial aspects in both MS and control conditions (Studies 2 and 4), people would increase their spending on prosocial but not proself aspects when they were aware of their own mortality. When people had lower level of spirituality, they preferred increasing their prosocial spending to personal spending in response to mortality awareness (Studies 2 and 4), and this effect emerged particularly when prosocial spending would contribute positively to people’s self-worth (Study 3).

We tested our hypotheses on diverse populations (including both college students and online adults) and operationalized the central variables in various ways across studies. The consistent results throughout the four experiments consolidated our confidence in the validity of our line of reasoning.

**Limitations and future directions**

We consistently found that spirituality attenuated prosocial attitudes toward money as MS defensive reactions across the four studies; however, our relatively low sample size in some of the studies is a limitation of the findings. The achieved power for the interaction effect between MS and spirituality on money attitudes was relatively low (62% in Studies 1 and 4, and 64% in Study 2) although it was acceptable in Study 3 (82%). To more solidly establish the MS defensive functions of spirituality, future research may replicate the current findings with larger and more diverse samples (e.g., including religious people with different affiliations, Atheists and Agnostics; Vail et al., 2012), and validate the unique contribution of spirituality as compared to other seemingly overlapping constructs.

With attitudes toward money and spending intentions as the main dependent variables in our research, we intended to show that spirituality mitigated prosocial attitudes toward money in response to MS. The increased prosocial spending in MS conditions may suggest a general prosocial tendency as a consequence of MS (Jonas et al., 2002; Piotrowski et al., 2018; Zaleskiewicz et al., 2015). Future studies could further investigate the question of how spirituality functions to predict more general prosocial processes unrelated to money (e.g., spending time or efforts on other’s behalf) when mortality is salient.

Moreover, the defensive mechanism of spirituality in MS situations was empirically examined in populations with a Chinese cultural background. China has long been considered systematically different from Western countries in, for example, self-construal and cultural
construal (Markus & Kitayama, 1991; Oyserman, Coon, & Kemmelmeier, 2002) and the average level of religiousness (Diener, Tay, & Myers, 2011; Lun & Bond, 2013). Our empirical findings demonstrated the applicability of spirituality as a means to manage death awareness for Chinese people, which is conceptually consistent with existing evidence collected in Western cultures (Jonas & Fischer, 2006; Piotrowski et al., 2018). However, the collectivistic cultural background of the current Chinese sample may also lead to different cultural values toward money and prosocial spending from the individualistic Western populations. Interdependent self-construal, which is predominant in collectivistic cultures, usually values the connections with others and communal goals more than independent self-construal in individualistic cultures (Gardner, Gabriel, & Lee, 1999; Markus & Kitayama, 1991). Therefore, the current finding of increased prosocial, instead of proself, spending as a defensive mechanism against MS might be attributed to the relationship-oriented values in collectivistic cultures. Future research should continue to examine spirituality as a universal transcendent experience, investigating its existential function in different cultural and religious backgrounds.

Conclusion

In four studies, results consistently suggest that in people’s fundamental challenge to cope with death awareness, spirituality and prosocial attitudes toward money have a similar defensive function. In our studies, participants showed increased prosocial money attitudes when reminded of their mortality; this effect, however, was attenuated when participants’ spirituality was high. We also found evidence for the self-worth striving implications of prosocial spending in MS situations. More generally, these findings underscore that death anxiety can influence people in counterintuitive ways, and that seemingly independent cultural expressions can satisfy the same underlying existential needs. It may be speculated that besides money and spirituality, also other cultural expressions can interchangeably satisfy such existential needs. For now, we conclude that spending money on prosocial goals can be a means to ward off death anxiety and that high spirituality can further buffer the need for prosocial spending in managing terror of death.

Open Practices

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Disclosure statement

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