

Running Head: Death Reflection

*Memento Mori*: The Development and Validation of the Death Reflection Scale

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***Memento Mori: The Development and Validation of the Death Reflection Scale*****Abstract**

Despite its potential for advancing organizational behavior (OB) research, the topic of death awareness has been vastly understudied. Moreover, research on death awareness has predominantly focused on the anxiety-provoking aspect of death-related cognitions, thus overlooking the positive aspect of death awareness, *death reflection*. This gap is exacerbated by the lack of a valid research instrument to measure death reflection. To address this issue, we offer a systematic conceptualization of death reflection, develop the Death Reflection Scale and assess its psychometric properties across four studies. Further, using a sample of 268 firefighters, we examine whether death reflection buffers the detrimental impact of mortality cues at work on employee well-being and safety performance. Results provide strong support for the psychometric properties of the Death Reflection Scale. Further, moderation analysis indicates death reflection weakens the negative effect of mortality cues on firefighters' safety performance. Overall, these findings suggest the newly developed Death Reflection Scale will prove useful in future research on death-related cognitions.

***Keywords:*** death reflection, death awareness, mortality cues, life satisfaction, safety performance

***Memento Mori: The Development and Validation of the Death Reflection Scale***

Countless employees go to work each day knowing that they may be confronted with the topic of death. Nurses, physicians, police, emergency responders and veterinarians encounter death or the process of dying throughout their careers, as do employees working in the military or funeral industries. Counselors, detectives, lawyers, religious workers, social workers, physical and occupational therapists, and home health aides need to help clients who are managing death-related issues. Administrative staff and call center employees may need to provide support and accept calls for businesses dealing with death, such as hospitals, suicide clean up services, or crisis hotlines. Many jobs involve risks that could lead to fatal injuries, including jobs in the agriculture, mining, construction, manufacturing, transportation, waste management and health care industries. Employees may think about death as they near retirement, care for a terminally ill relative, or cope with a workplace accident. As Grant and Wade-Benzoni (2009) point out, “as scholars seek to understand and explain organizational life, it is important to consider the role of death awareness as a *central* feature of the human condition” (p. 617; emphasis added).

To the extent that death presents a threat to an individual, death-related cognitions may contain negative, anxiety-provoking aspects (Greenberg, Solomon, & Arndt, 2008; Vail et al., 2012). Indeed, the vast majority of death awareness research has been conducted through this lens, primarily through Terror Management Theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986). The central thesis of TMT is that anxiety-provoking death-related cognitions will lead to self-protective actions, often taking the forms of prejudice and even aggression against those who threaten an individual’s self-esteem and worldviews (Belmi & Pfeffer, 2016; Greenberg et al., 2008; Stein & Cropanzano, 2011). However, in exclusively focusing on the anxiety-provoking component of death awareness, this literature fails to account for the positive, growth-

oriented mindset about death that is essential to prosocial actions (Cozzolino, 2006; Cozzolino, Staples, Meyers, & Samboceti, 2004; Grant & Wade-Benzoni, 2009; Lykins, Segerstrom, Averill, Evans, & Kemeny, 2007; Vail et al., 2012). For example, in the months following 9/11, stories abound where many people decided to go into service-oriented careers, such as firefighting, medicine, and teaching (Wrzesniewski, 2002). The sharp contrast between research on the anxiety-provoking aspects of death awareness and the anecdotal stories and theoretical propositions (e.g., Cozzolino et al., 2004) of prosocial actions following death-related cognitions leaves open an important question: Is exclusively focusing on the anxiety-provoking aspects of death awareness sufficient for a complete understanding of death awareness?

The answer is no. In their seminal theory of death awareness at work, Grant and Benzoni (2009) highlight that death reflection—positive aspects of death awareness that are inductive to prosocial actions—holds the key to understanding the growth-oriented potential of death cognitions. More importantly, death reflection also holds promise to advance scholarly understanding of important *workplace* phenomena. Given the relevance of death-related cues inherent in many jobs (e.g., firefighting), death reflection may be a key contingency factor influencing how employees' well-being and work behaviors are affected in such high-risk occupational contexts. Indeed, research indicates considerable variability in how employees in safety-critical industries react to risks and hazards (Nahrgang, Morgeson, & Hofmann, 2011; Sliter, Sinclair, Yuan, & Mohr, 2014). To the extent that death-related cues are an inherent feature of these occupations, identifying moderators that can buffer their negative effect will prove especially valuable. Factors external to the occupation context (e.g., aging) may also increase the relevance of death reflection in influencing one's work behaviors. Finally, death reflection may motivate mature employees to focus more on the prosocial aspects of their job

(Goštautaitė & Bučiūnienė, 2015), engage in more positive leadership behaviors (Zacher, Rosing, & Frese, 2011), participate in volunteering (Grant, 2012; Okun & Schultz, 2003), and quit their jobs to pursue even more meaningful avocations (Lee, Hom, Eberly, Li, & Mitchell, 2017).

Unfortunately, despite repeated calls for further study (Grant & Benzoni, 2009; Stein & Cropanzano, 2011), OB research on the topic of death is still sparse (see Belmi & Pfeffer, 2016 and Sliter et al., 2014 for exceptions). Moreover, there is no valid scale to assess death reflection. The lack of a validated survey instrument hinders scholarly attempts to incorporate death reflection into OB research, which predominantly relies on survey designs. Accordingly, the overarching goal of our research was to develop and validate a measure of death reflection. In Studies 1, 2, and 3, we developed a measure of death reflection and examined its psychometric properties. In Study 4, we examined death reflection among firefighters, an employee population that frequently encounters mortality cues at work. Specifically, we investigated the criterion-related validity of death reflection and tested its moderating role in the relationship between mortality cues and firefighter occupational safety (i.e., safety performance) and well-being (i.e., life satisfaction).

We make a number of contributions to the literature. First, in developing a psychometrically valid scale of death reflection, we take an important step toward advancing the positive, growth-oriented aspect of death awareness. This scale provides a viable instrument for researchers to examine and extend a wide array of OB research topics that may benefit from incorporating death reflection. Second, we examine death reflection in relation to mortality cues and occupational safety and well-being using a sample of firefighters. In testing the buffering effect of death reflection in the relationship between mortality cues and employee outcomes, we

not only add to the small body of OB literature documenting the detrimental effects of mortality cues at work (Sliter et al., 2014), but also highlight death reflection as a key contingency that can lessen the negative effect of mortality cues on employees. Theoretically, our findings point to the promise of death reflection to help better understand people's reactions to mortality cues.

Practically, our results can also help to inform effective workplace interventions to minimize the detrimental effect of mortality cues on employee well-being and performance.

### **Background and Conceptualization of Death Reflection**

#### **Divergent Findings in Death Awareness Research**

Death awareness is the recognition and realization of our own mortality, an understanding that our lives will one day end (Chaplin, John, & Goldberg, 1988; Stein & Cropanzano, 2011). The effects of death awareness have been predominantly studied from the lens of Terror Management Theory (TMT; Greenberg et al., 1986; Solomon, Greenberg, & Pyszczynski, 1991), which posits that the fear of death is a significant motivating factor in human behavior (Greenberg et al., 1986; Pyszczynski, Greenberg, & Solomon, 1997). Specifically, conflict between the drive for life and the inescapability of death creates terror, and people strive to cope with, or manage, this terror. The anxiety-provoking effect of death awareness has received robust support from TMT research (Burke, Martens, & Faucher, 2010). Individuals exposed to mortality salience inductions engage in behaviors intended to increase self-esteem and justify their cultural worldviews, such as by rejecting those who violate their cultural values (Greenberg et al., 2008; Pyszczynski et al., 1997).

However, merely focusing on its anxiety-provoking aspects provides an incomplete picture of death awareness. Early work on TMT (Solomon et al., 1991) noted the possibility that awareness of death could result in generous and compassionate behaviors. In a handful of recent

studies, researchers conclude that not all people respond with hostility and self-protection after contemplating death or encountering death-related stimuli; rather, they may show attitudes and behaviors focused on helping others and helping the world (Cozzolino, 2006; Cozzolino et al., 2004; Grant & Wade-Benzoni, 2009; Lykins et al., 2007; Vail et al., 2012). Further, Erikson's (1963) classic theory of development proposes that around midlife, individuals become aware of their impending death and can either stagnate or become generative, participating as a productive member of society. Relatedly, socioemotional selectivity theory (Carstensen, Isaacowitz, & Charles, 1999) contends that when people recognize that time left in their lives is limited, they tend to focus on emotion-related goals and derive emotional meaning from important social partners. More recently, Cozzolino (2006) argued that post-traumatic growth and near-death experiences explain why individuals of any age may respond to increases of death awareness with prosocial behaviors. Further, people often react to traumatic events and the subsequent death awareness by reappraising their life and priorities, developing themselves, and putting more effort into relationships (Tedeschi & Calhoun, 1996). Among individuals who have had near-death experiences, reactions commonly include an increased appreciation for life, a greater desire to seek out meaning, and a lack of concern for extrinsic motivators, such as impressing others (Ring, 1984).

### **Introducing and Conceptualizing Death Reflection**

In order to reconcile the divergent findings in the literature about the positive and negative aspects of death awareness, Grant and Wade-Benzoni (2009) introduced the contingency model of death awareness. This model proposes that these different reactions occur because individuals are aware of their own mortality through two separate information-processing systems (Metcalf & Mischel, 1999). The first pathway is *death anxiety*, in which

individuals use their “hot” or experiential system to make sense of death, relying on a heuristic processing system characterized as being intuitive, emotional, and impulsive. The second pathway is *death reflection*, in which individuals use their “cool” or cognitive system, which is more analytical and rational.

According to this model, death reflection refers to when individuals “put their lives in context, contemplate their meaning and purpose, and review how others will look upon them after they have passed” (Grant & Wade-Benzoni, 2009; p. 605). It further proposes that when people take this perspective on death, they may be motivated to make a positive impact through generative actions. Death reflection has never been explicitly measured; however, Cozzolino et al. (2004) developed a death reflection manipulation and found that participants in the death reflection condition tended to increase intrinsic, unselfish behaviors. Similarly, Frias, Watkins, Webber and Froh (2011) found that participants in the death reflection condition showed enhanced gratitude compared to those in the death anxiety condition. Further, Lykins and colleagues (2007) found that death reflection led to greater emphases on intrinsic goals.

We draw from this body of research and literature on self-related cognition (Trapnell & Campbell, 1999; Watkins, 2008) to offer a comprehensive conceptualization of death reflection. First, we note that death reflection is characterized by its positive valence—a key feature distinguishing it from maladaptive death-induced cognitions. Although the inevitability of death may create negative emotions, individuals can also cognitively process positive aspects of their own mortality. Similar to individuals who have reported post-traumatic growth following a near-death experience, individuals can reflect on death in a way that is characterized by thoughtfulness, concern for others, and a fresh perspective on life (Cozzolino, 2006; Ring, 1984; Tedeschi & Calhoun, 1996). This notion is consistent with the transactional model of stress

(Lazarus & Folkman, 1984) and socioemotional selectivity theory (Carstensen et al., 1999), which both posit that individuals can derive positive cognitions from threatening situations.

Second and relatedly, death reflection encompasses deliberate cognitive processing that involves low-level and concrete construals. In alignment with the contingency model of death awareness (Grant & Wade-Benzoni, 2009), death reflection involves activation of the “cool” cognitive system. Specifically, such cognitive processing is focused on specific, low-level construals that entail contextual mental representations of events and actions (Cozzolino, 2006; Watkins, 2008). To illustrate, high-level abstract construals may only contain a decontextualized mental representation of the events (e.g., “Everyone dies eventually”). This is the “hot” cognitive system that can lead to a fight-or-flight response. By comparison, low-level construal entails detailed processing of events and associated actions (e.g., “What specific actions do I want to take given that death is inevitable?”). In this type of cognitive processing, individuals deliberately search for concrete actions that they can take to realize the positive potential of a threatening situation.

Third, we contend that death reflection is relatively stable, compared to more state-like constructs such as state affect. As death reflection represents one’s motivated cognitive processing, it is not likely to demonstrate substantial temporal variation in a short period. For example, past research has found that reflective cognitive processing about one’s depressed mood had a test-retest correlation of .60 with a one-year interval (Treyner, Gonzalez, & Nolen-Hoeksema, 2003). Similarly, reflective processing of one’s mortality should also be relatively stable. Nonetheless, death reflection is open to the influence of aging, as predicted by Erikson’s (1963) theory of development and socioemotional selectivity theory (Carstensen et al., 1999). That is, as people age, they tend to be more receptive to their own mortality and emphasize

making meaningful connections and leaving their legacy. Importantly, the short-term stability and the correlation with age in a longer timeframe are not incongruent. For example, even the big five personality traits that are stable in a shorter timeframe demonstrate changes across the life span (Specht, Egloff, & Schmukle, 2011). Additionally, certain events (e.g., near-death experiences) and experimental manipulations (Cozzolino et al., 2004) can also induce death reflection. The fact that death reflection is both relatively stable and malleable in response to certain events is consistent with research on other types of cognitive mindsets, such as implicit person theory, which is relatively stable but also open to the influence of certain cues and manipulations (Dweck, Chiu, & Hong, 1995).

Accordingly, we define death reflection as an individual's deliberate cognitive processing of mortality that focuses on the positive aspects of death, which encompasses concrete behavioral intentions to realize such positive aspects. Having offered our conceptualization of death reflection, we next describe how we followed Hinkin's (1998) scale development process and conducted four studies to develop and validate the Death Reflection Scale. Specifically, we generated items and refined the scale through exploratory factor analysis (EFA) in Study 1, and confirmed the factor structure in Study 2. In Study 3, we evaluated its convergent and discriminant validity. We then tested its criterion-related validity and its moderating effect to highlight its theoretical importance in Study 4.

### **Study 1: Item Generation and Exploratory Factor Analysis**

In Study 1, we generated death reflection items and tested the factor structure through EFA by collecting data from an online crowdsourcing website.

#### **Item Generation**

As extant theory does not provide clear guidance regarding the dimensional structure of death reflection, we took an inductive approach to item generation so that we could generate items representative of its construct domain (Hinkin, 1998). In order to create a pool of items, we reviewed the literature on death reflection (Cozzolino, 2006; Cozzolino et al., 2004; Frias et al., 2011; Grant & Wade-Benzoni, 2009; Lykins et al., 2007; Ring, 1984; Tedeschi & Calhoun, 1996) for definitions and descriptors of what death reflection entails. Related scales, including death anxiety (Florian & Kravetz, 1983; Hoelter, 1979), death acceptance (Klug & Sinha, 1987; Ray & Najman, 1975), spirituality (Allport & Ross, 1967; Hodge, 2003; Howden, 1992) and post-traumatic growth (Tedeschi & Calhoun, 1996), were examined for possible overlap with death reflection. Finally, we used seven interview transcripts of terminal patients discussing their experience as advanced cancer patients created by Rand, Banno, Shea, and Cripe (2016) to generate death-reflection themes.

The first, fourth, fifth, and last authors then created a pool of 71 items based on the literature review. These items were adjusted to be consistent in terms of the determined stem (“when I think about death”) and in the present tense. Following Hinkin (1998), these authors then examined the items for commonality and six themes emerged: 1) Motivation to Help, 2) Motivation to Live, 3) Putting Life in Perspective, 4) Finding Meaning in Life, 5) Connection to Others, and 6) Legacy. The authors sorted each item based on semantic commonality, with an “other” category being available for any items that did not fit. After sorting, items with perfect agreement were retained (32 items), and items with mixed agreement were discussed until these authors either reached consensus on the categorization (12 items), or decided to omit the item (18 items). Items that were sorted into “other” category were deleted (9 items). The results of the sorting task yielded an initial pool of 44 items across the six possible themes.

## Method

***Participants and Procedure.*** Participants were recruited through Amazon's Mechanical Turk (MTurk). The prerequisites to participate in the current study were that participants had to 1) be at least 18 years of age, 2) be a citizen of the United States, and 3) have a 97% approval rate or higher. This survey included the 44 death reflection items (in a randomized order), demographic items, and three attention check items (e.g., "answer *strongly agree* to this item"). A total of 500 participants responded to the survey. Responses were made on a 6-point scale (1 = *strongly disagree* to 6 = *strongly agree*). We omitted data from participants who endorsed any of the attention check items or who took less than 3 minutes to complete the survey (i.e., the fastest possible time to accurately take the survey based on pilot testing). The final sample, after data cleaning and listwise deletion, consisted of 436 people. This sample was primarily male (66.5%) and White (82.6%) with an average age of 31.17 years old ( $SD = 10.39$ ). Although we did not have employment status data on this group, recent research shows that the majority of MTurk workers are employed (Levay, Freese, & Druckman, 2016).

## Results

Responses to the 44 pilot items were analyzed using EFA with principal axis factoring and promax rotation. An initial EFA was conducted on all 44 items. Factors were considered for retention if they had more than three items loading on that factor, had an eigenvalue greater than 1, and were located on the scree plot prior to the point where the slope started to level off (Reise, Waller, & Comrey, 2000). We eliminated items that did not load strongly on any factor (i.e., all loadings smaller than .30) or had significant cross-loadings (i.e., multiple loadings greater than .30).

The initial factor analysis yielded six factors. Five of the factors corresponded to the themes that emerged in item generation: Motivation to Help, Motivation to Live, Putting Life in Perspective, Connection to Others, and Legacy. The sixth factor was not clear in terms of the content of the items loading on this factor. As such, we removed those items. Next, we eliminated items that had high cross-loadings through an iterative process by starting with the item that had the highest cross-loading and rerunning the EFA. After 6 additional items were eliminated, we retained 29 items that loaded on the five factors. Throughout this process, most items originally written to tap into Finding Meaning in Life were deleted because they either loaded on the sixth factor or had substantial cross-loadings.

Long surveys may induce response biases (Schmitt & Stults, 1985; Schriesheim & Eisenbach, 1990) and pose practical challenges for researchers given the constraints on survey space. As satisfactory internal consistency can be achieved with as few as three items (Harvey, Billings, & Nilan, 1985), we further shortened the scale by eliminating 14 items that had relatively small factor loadings or semantic redundancy, resulting in five factors (3 items per factor) that explained 64.85% of the total variance. Importantly, this decision did not compromise the content validity of the scale as discarded items were similar to the final items in terms of their semantic content. The final scale items, and their respective factor loadings, are available in Table 1, along with descriptive statistics for each factor.

### **Study 2: Confirmatory Factor Analysis**

In Study 2, we sought to test the factor structure through confirmatory factor analysis (CFA).

#### **Method**

***Participants and Procedure.*** Another online panel was recruited via MTurk to replicate the factor structure from Study 1. The prerequisites to participate were the same as Study 1. This survey included the 15 death reflection items, two attention check items, and demographic questions. A total of 500 participants responded to the survey. We eliminated participants from the data set who a) responded incorrectly to the attention check items (e.g., “please choose *strongly disagree*”), b) took less than 1.5 minutes on the survey; or c) already participated in Study 1. The final sample consisted of 380 people. This sample was primarily male (58.9%) and White (80.5%) with an average age of 33.22 years old ( $SD = 10.55$ ).

## **Results**

We utilized the open-source R package (“lavaan”; Rosseel, 2012) to conduct a set of confirmatory factor analyses to assess the fit of the five-factor model as well as several alternative models. The five-factor model provided a good fit to the data ( $\chi^2 = 192.13$ ,  $df = 80$ , CFI = .96, SRMR = .05) and the alternative models fit poorly to the data in terms of chi-square difference tests and overall fit indices<sup>1</sup> (Hu & Bentler, 1999). We tested another model with a higher-order factor subsuming the five factors. This model fit significantly worse than the five-factor model ( $\chi^2 = 218.09$ ,  $df = 85$ , CFI = .95, SRMR = .06,  $\Delta\chi^2(5) = 25.96$ ,  $p < .01$ ), suggesting that the five dimensions each provide unique coverage of the overall cognitive representation of the prosocial aspects of death-related cognitions (Thorson & Powell, 1992). The standardized factor loadings in the five-factor CFA model are presented in the right half of Table 1. Each item obtained a high loading on its corresponding latent factor. The correlations among the latent factors and their descriptive statistics are reported in Table 2.

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<sup>1</sup> Given the number of four-factor models that we tested, we do not include nested-model testing results in the paper for the sake of simplicity. However, detailed results are available upon request.

### **Study 3: Convergent and Discriminant Validity**

In Study 3, we investigated the convergent and discriminant validity evidence for the Death Reflection Scale by correlating the scale with measures of several other conceptually related and distinct constructs. We also examined its test-retest reliability with a three-week interval.

Death reflection and trait reflection both are forms of constructive cognition, whereby individuals explore aspects of themselves in curiosity-driven self-perception (Trapnell & Campbell, 1999). Specifically, trait reflection refers to “a summary conception of self-attentiveness motivated by curiosity or epistemic interest in the self” (Trapnell & Campbell, 1999, p. 297). Importantly, trait reflection represents a form of self-reflection that captures an individual’s general tendency to analyze broad aspects of one’s self-concept. By contrast, death reflection has a narrower range of specificity because it focuses on aspects that are specifically related to death awareness, such as motivation to help others and putting life in perspective when thinking about death. Thus, we expected death reflection and trait reflection would be positively correlated, but not redundant. Compared to trait reflection, trait rumination represents a form of negatively-valenced self-focused cognition. It refers to “a summary conception of self-attentiveness motivated by perceived threats, losses, or injustices to the self” (Trapnell & Campbell, 1999, p. 297). We expected death reflection would be distinct from trait rumination because trait rumination taps into negative self-attentiveness at a more general level whereas death reflection deals with positive death-related cognitions.

We tested three additional positive correlates of death reflection. First, openness to experience should be positively correlated with death reflection because individuals who tend to be curious will have more interest in thinking about the meaning of mortality. Second, following

the contingency model of death awareness (Grant & Wade-Benzoni, 2009), we expected that death reflection would be positively related to prosocial identity, because death reflection is processed in the “cool”, deliberate, intentional information processing system that allows individuals to make rational choices to become more generative, helpful, and self-transcendent. Third, relational self refers to one’s disposition to incorporate relationships with close others as an integral part of his/her self-construal (Cross, Bacon, & Morris, 2000). Given that death reflection motivates individuals to establish and maintain meaningful connections with others, we expected it to be positively related to relational self. Importantly, we did not expect correlations between death reflection and its correlates to be large enough to suggest construct redundancy, as death reflection is theoretically distinct from these correlates.

Finally, consistent with our conceptualization of death reflection as a relatively stable construct, we expected that the short-term test-retest reliability of death reflection would be similar to other established trait measures. For example, Treynor et al. (2003) found that the test-retest reliability of one’s reflective processing of depressed mood was .60 over a one-year interval. Similarly, the short-term test-retest reliability of death reflection should be in the same range, or even greater than .60 given our shorter time span (i.e., three weeks).

## **Method**

*Participants and Procedure.* Undergraduate students enrolled in an introductory management class were invited to participate in this study. We adopted a time-lagged design and administered two online surveys temporally separated by three weeks. In the Time 1 survey ( $n = 205$ ), we assessed death reflection, trait reflection, trait rumination, openness to experience and relational self. In the Time 2 survey, we measured death reflection and prosocial identity. The final study sample consisted of 169 students (71.6% male). Their average age was 20.20 years

old ( $SD = 1.91$ ). Most of them were White (74.0%) and in their sophomore year (60.4%).

Although we did not collect any data on their employment status, undergraduate students from this university typically work at least part-time.

### ***Measures***

***Death reflection*** (Time 1 & 2). We administered the 15-item Death Reflection Scale (1 = *strongly disagree* to 5 = *strongly agree*)<sup>2</sup>. Specifically, we asked participants to think about how they generally felt when they thought about death (Time 1:  $\alpha = .92$ ; Time 2:  $\alpha = .93$ ).

***Trait reflection*** (Time 1). We used three items with the highest factor loadings from the 12-item scale developed by Trapnell and Campbell (1999) to keep the survey relatively short and avoid respondent fatigue. Participants were instructed to answer each question (e.g., “I often love to look at my life in philosophical ways”;  $\alpha = .86$ ) based on how they felt and acted in general. A 7-point response scale was used (1 = *strongly disagree* to 7 = *strongly agree*).

***Trait rumination*** (Time 1). Similar to trait reflection, we used three items with the highest factor loadings from Trapnell and Campbell’s (1999) trait rumination scale. Participants responded to the items (e.g., “I always seem to be rehashing in my mind recent things I’ve said or done”;  $\alpha = .89$ ) on a 7-point scale (1 = *strongly disagree* to 7 = *strongly agree*).

***Openness to experience*** (Time 1). We used the 4-item mini-IPIP scale developed by Donnellan, Oswald, Baird, and Lucas (2006) to measure openness to experience. Participants used a 7-point scale (1 = *strongly disagree* to 7 = *strongly agree*) to indicate their agreement with each item (e.g., “I have a vivid imagination”;  $\alpha = .79$ ).

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<sup>2</sup> We switched to a 5-point scale in Study 3 and Study 4 to reduce the cognitive burden on participants.

**Prosocial identity** (Time 2). We used the 3-item scale (Grant, Dutton, & Rosso, 2008) to assess prosocial identity. Participants used a 7-point scale (1 = *strongly disagree* to 7 = *strongly agree*;  $\alpha = .88$ ) to indicate their agreement with each item (e.g., “I see myself as caring”) based on how they usually felt.

**Relational self** (Time 1). We used the 11-item scale developed by Cross and colleagues (2000) to measure relational self. Participants were asked to use a 7-point scale (1 = *strongly disagree* to 7 = *strongly agree*) to indicate how they generally felt about their connections with others (e.g., “My close relationships are an important reflection of who I am”;  $\alpha = .87$ ).

## Results

Prior to testing the zero-order correlations between death reflection and the other measures, we conducted a CFA to examine the factor structure of the death reflection scale. Replicating Study 2, we found that the five-factor model provided a good fit to the data at both times (Time 1:  $\chi^2 = 164.47$ ,  $df = 80$ , CFI = .94, SRMR = .05; Time 2:  $\chi^2 = 161.96$ ,  $df = 80$ , CFI = .95, SRMR = .05). The higher-order model fit worse than the five-factor model (Time 1:  $\chi^2 = 174.28$ ,  $df = 85$ , CFI = .94, SRMR = .05,  $\Delta\chi^2(5) = 9.81$ ,  $p = .08$ ; Time 2:  $\chi^2 = 187.80$ ,  $df = 85$ , CFI = .94, SRMR = .07,  $\Delta\chi^2(5) = 25.84$ ,  $p < .01$ ). We assessed measurement equivalence across the two measurement occasions by comparing a set of nested models (Vandenberg & Lance, 2000). Death reflection demonstrated full metric invariance in this sample ( $\chi^2 = 333.74$ ,  $df = 170$ , CFI = .95, SRMR = .05). This model did not provide a significantly different fit compared to the baseline model (full configural invariance:  $\chi^2 = 326.43$ ,  $df = 160$ , CFI = .95, SRMR = .05;  $\Delta\chi^2(10) = 7.31$ ,  $p = .70$ ) but fit significantly better than the scalar invariance model ( $\chi^2 = 361.05$ ,  $df = 180$ , CFI = .94, SRMR = .05;  $\Delta\chi^2(10) = 27.30$ ,  $p < .01$ ). This suggests that factor loadings were

invariant across the two time points but the intercepts were not. Taken as a whole, these analyses provide fairly strong replication evidence for the structure of the Death Reflection Scale.

The test-retest reliability of the death reflection composite was .67 (test-retest reliability based on dimensions ranged from .52 to .67). We compared the test-retest reliability from the current study against that from Treynor et al. (2003;  $r = .60$ ,  $N = 1,130$ ). A single-sided test ( $r_1 = .60$ ,  $n_1 = 1,130$ ;  $r_2 = .67$ ,  $n_2 = 169$ ;  $z = 1.41$ ,  $p = .08$ ) showed that the test-retest reliability from the current sample was not significantly greater than that from Treynor et al. (2003). Consistent with our conceptualization of death reflection being relatively stable, this suggests that the test-retest reliability of death reflection from the current study approximates the one-year test-retest reliability of reflective processing of depressed mood from Treynor et al. (2003).

We report the descriptive statistics and correlations among study variables in Table 3. Results of the CFAs reported above suggest that death reflection may be best conceptualized as a five-factor model. However, because we are in the early stages of construct validation and that researchers in some cases may be interested in the more parsimonious global score approach to death reflection, we present the results of both the individual factors and the death reflection composite. The general pattern of correlations between death reflection dimensions and other correlates is largely consistent with that based on the composite. Death reflection (T1) was positively but only modestly related to trait reflection ( $r = .27$ ,  $p < .01$ ), suggesting that, although death reflection is also concerned with reflective cognition, it does not substantially overlap with broad self-reflection. Death reflection (T1) did not have a significant relationship with trait rumination ( $r = .06$ ,  $p = .45$ ), suggesting that death reflection, with its positive valence, is theoretically distinct from trait rumination, which entails negative perseverative cognition. Death reflection (T1) also had a non-significant relationship with openness to experience ( $r = .06$ ,  $p =$

.43) and prosocial identity ( $r = .13, p = .09$ ), suggesting that the overlap with these variables may be even smaller than we first expected. Finally, death reflection was positively related to relational self ( $r = .21, p < .01$ ), consistent with the idea that contemplating one's death motivates an individual to maintain meaningful connection with others. Age was not significantly related to death reflection ( $r = -.09, p = .27$ )<sup>3</sup>, which may have been due to restricted range of age in this sample. Taken as a whole, the general pattern of low to moderate correlations between death reflection and its proposed correlates provides further evidence of its construct validity.

#### **Study 4: Criterion-Related Validity**

We next turned to investigating the criterion-related validity of the Death Reflection Scale by examining its relationship with employee well-being (i.e., life satisfaction) and work behaviors (i.e., safety performance) among a sample of firefighters, an occupation where employees face not only threats to their own survival but also may witness others' deaths or traumas. We focused on these criterion variables because they are context-relevant outcomes in this high-risk occupational setting. As such, criterion-related validity evidence from this sample can lend strong support to the relevance and importance of death reflection.

Life satisfaction, an important component of subjective well-being, refers to individuals' overall evaluation of their degree of contentment with life (Diener, Emmons, Larsen & Griffin, 1985). Erdogan, Bauer, Truxillo, and Mansfield (2012) point out that, "comprehensive research should consider life satisfaction as an essential factor in organizational research" (p. 1070).

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<sup>3</sup> Following the suggestion of a reviewer, we checked for the non-linear relation between age and death reflection. After including the grand-mean centered linear term of age, its square term was not significant in predicting death reflection measured at either Time 1 ( $B = .00, ns$ ) or Time 2 ( $B = .00, ns$ ).

Firefighters high in death reflection are more likely to focus on the positive aspects of death awareness and put greater emphases on intrinsic life goals, such as helping others and making a difference (Cozzolino et al., 2004; Lykins et al., 2007). These types of intrinsic life goals are important antecedents to well-being (Sheldon, Ryan, Deci, & Kasser, 2004). In reminding themselves of the value of life and connection to close others, firefighters high in death reflection can counteract the hedonic adaptation through which people may get accustomed to positive things in life (Diener & Diener, 1996). By viewing life from a broader perspective, they can also avoid the tendency to be influenced by the negativity bias (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). As such, firefighters high in death reflection are more likely to report higher levels of life satisfaction.

*Hypothesis 1:* Death reflection is positively related to life satisfaction.

Safety performance is an important domain of job behaviors that is critical for the maintenance and promotion of workplace safety (Griffin & Neal, 2000), especially for jobs that involve saving lives from dangerous situations. Death reflection, with its emphasis on prosocial aspects of death awareness, can increase one's felt responsibility, which has been linked to lower levels of risk-taking (Levenson, 1990) and higher levels of safety performance (Curcuruto, Mearns, & Mariani, 2016; Machin & Sankey, 2008). With the activation of the "cool", deliberate cognitive processing system, firefighters high in death reflection are more likely to be cognitively alert and to concentrate on preventing safety failures in their jobs (Wallace & Chen, 2005). Further, firefighters high in death reflection will put greater emphasis on following safety protocols, as they are motivated to not only live better themselves and stay connected with close others but also to help other people and make a positive impact. Viewing things from a broader perspective can also help firefighters see the bigger picture of the impact of their work and

discern the value of maintaining workplace safety and protecting society from danger.

Accordingly, firefighters high in death reflection will be more likely to demonstrate higher levels of safety performance on the job.

*Hypothesis 2:* Death reflection is positively related to safety performance.

As stated earlier, recent research indicates that employees working in dangerous occupations do not always react to mortality cues at work (e.g., a mass-casualty incident) through decreased well-being and performance (Sliter et al., 2014), suggesting that death-related cognitions such as death reflection may be a pertinent moderator. Investigating the moderating role of death reflection can further highlight its theoretical importance and relevance for the workplace literature as a key contingency underlying employee well-being and work behaviors. Accordingly, we investigated the moderating effect of death reflection in the relationship between mortality cues and firefighter life satisfaction and safety performance. Specifically, we focused on a salient form of mortality cues at work, traumatic job stressors, which refer to acute stressful events that cause or pose threats to the well-being and lives of the self and others (American Psychiatric Association, 1994). Traumatic stressors represent a pervasive job stressor for firefighters and are related to burnout, post-traumatic stress disorder, and absenteeism (Sliter, Kale, & Yuan, 2014; Sliter et al., 2014). In most cases, the occurrence of traumatic stressors (e.g., a life-threatening fire) in firefighting is beyond the control of firefighters, which renders inquiries into potential buffering factors both theoretically and practically meaningful.

We propose that death reflection may ameliorate the detrimental effect of mortality cues on employees' life satisfaction, as death reflection may help enable individuals to slow down the resource depletion process triggered by mortality cues (Hobfoll, 1989). Past experimental research indicates that death reflection manipulations can shift people's focus from extrinsic

values (e.g., wealth) to intrinsic ones (e.g., thoughts of others; Cozzolino et al., 2004; Lykins et al., 2007). For example, death reflection manipulations increased life reflection (“did best with time I had”) and decreased selfish other thoughts (“I am the light in their lives”; Cozzolino et al., 2004). Similarly, firefighters high in death reflection will tend to appreciate their life and connection with others (Frias et al., 2011). They will also transcend defensiveness in the face of morality cues and focus on the prosocial aspects of their job in helping others and saving lives. In putting things in a broader perspective, they will be able to discern the important role of their job in society. To the extent they appreciate these intrinsic values, they will be less threatened by mortality cues on the job compared with those low in death reflection. Further, intrinsic goals are an important pillar of subjective well-being (Sheldon et al., 2004). Therefore, firefighters high in death reflection are less likely to experience deteriorated life satisfaction as their evaluation of contentment with life is less vulnerable to the distressing effect of mortality cues. In other words, death reflection may act as a buffer in the relationship between mortality cues and life satisfaction such that the resource depleting effect of mortality cues in undermining life satisfaction will be more pronounced for firefighters who are low in death reflection.

*Hypothesis 3:* Death reflection buffers the negative relationship between mortality cues and life satisfaction such that the relationship is weaker when death reflection is high than when it is low.

Mortality cues decrease safety performance because individuals, concerned with preserving their resources, may take short cuts to complete their work tasks, thereby undermining workplace safety (Hobfoll, 1989). However, to the extent that death reflection can help firefighters transcend defensiveness (Cozzolino et al., 2004; Lykins et al., 2007), those high in death reflection may be less threatened by mortality cues and thus still able to carry out their

work in a safe manner. Supporting the critical role of death reflection, past research has found that individuals high in death reflection can overcome defensiveness, manifested through more blood donation (Blackie & Cozzolino, 2011) and less greed (Cozzolino et al., 2004). In a similar vein, firefighters high in death reflection will tend to appreciate the importance of workplace safety in that it is congruent with helping others and making a positive impact—the very ways to realize the positive aspects associated with death awareness. Further, to the extent firefighters value life and connection to important others, they are more likely to see the value in safe work practices than those low in death reflection. Putting life in perspective will also help them become less distracted by the danger on the job so that they can stay cognitively focused on executing standard work practices in spite of mortality cues at work. As a result, death reflection can act as a buffer in the relationship between mortality cues and safety performance such that only those low in death reflection will demonstrate decreased safety performance in the face of mortality cues.

*Hypothesis 4:* Death reflection buffers the negative relationship between mortality cues and safety performance such that the relationship is weaker when death reflection is high than when it is low.

## **Method**

*Participants and Procedure.* We circulated the study information on a social media page of a firefighter group and invited firefighters to participate in the study. Participants filled out two surveys temporally separated by one month. At Time 1 ( $n = 440$ ), they reported mortality cues, death anxiety, and death reflection. A month later, they took the Time 2 survey that included safety performance and life satisfaction. The final study sample consisted of 268 firefighters, who were on average 32.81 years old ( $SD = 6.57$ ), and had been working as a

firefighter for 7.30 years ( $SD = 7.12$ ). The sample was mostly male (92.5%). Fifty-three percent of them were White.

### ***Measures***

***Death Reflection*** (Time 1). We used our newly developed 15-item Death Reflection Scale to assess death reflection. Participants indicated their agreement with each statement on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). As the dimensions were strongly correlated (mean  $r = .58$ , range: .51–.70), we used the composite score ( $\alpha = .92$ ) in addition to separate analyses with the individual dimensions (see Results for details).

***Mortality Cues*** (Time 1). Following previous research (Sliter et al, 2014), we used a traumatic stressors scale developed specifically for firefighters (Allen, 1995) to assess mortality cues. As Sliter et al. (2014) note, although there is substantial overlap between traumatic stressors and mortality cues, the two are conceptually distinct. Traumatic stressors are critical events that threaten lives and the physical well-being of individuals, whereas mortality cues are any external stimuli that serve as a reminder of death. Thus, traumatic events almost always serve as mortality cues, whereas not all mortality cues are traumatic events (e.g., walking past a graveyard). Participants reported the frequency of 17 acutely stressful events that exposed them to mortality cues on a 5-point scale (1 = *never* to 5 = *extremely often*;  $\alpha = .97$ ). Sample events included “a large fire causing death or injury” and “the death of a worker(s)”.

***Safety Performance*** (Time 2). Firefighter safety performance was measured with a 20-item scale that taps into both mandatory compliance behaviors and extra-role citizenship behaviors toward promoting the safety of other individuals and overall workplace safety (Yuan, Sliter, Li, & Xu, 2015). Participants rated how often they engaged in each behavior on a 7-point

scale (1 = *never* to 7 = *always*). Sample items included “I follow safety procedures, even it if causes my work to take longer” and “I encourage coworkers to work in a safe manner” ( $\alpha = .96$ ).

***Life Satisfaction*** (Time 2). We assessed life satisfaction with the 5-item scale developed by Diener and colleagues (1985). Participants rated their agreement with each item (e.g., “I am satisfied with my life.”) on a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*;  $\alpha = .80$ ).

***Control variables.*** According to Erikson’s (1963) theory of development and socioemotional selectivity theory (Carstensen et al., 1999), age may be related to both death reflection and life satisfaction, thus acting as a potential confounding variable if not controlled (Spector & Brannick, 2011). Accordingly, we controlled for age when assessing the effects of mortality cues and death-related cognition on safety performance and life satisfaction. Occupational tenure may be systematically related to both exposure to mortality cues and death reflection (Grant & Wade-Benzoni, 2009). Therefore, we also controlled for occupational tenure in our analysis.<sup>4</sup> Additionally, we also measured the anxiety-provoking aspects of death awareness—death anxiety (Time 1), in order to empirically evaluate the overlap between death anxiety and death reflection. Specifically, we used the shortened version of the Revised Death Anxiety Scale (RDAS; Thorson & Powell, 1992). It includes three dimensions: anxieties over “not being”, anxieties over pain, and anxieties over life after death. Participants indicated their agreement with each statement on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Sample items include “the subject of life after death troubles me greatly” and “the pain

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<sup>4</sup> Given the strong correlation between age and occupational tenure ( $r = .74$ ), we checked for multicollinearity by inspecting the VIF values following a reviewer’s suggestion. The VIF values of the predictor variables were well below the commonly used cutoff of 10 (Cohen, Cohen, Aiken, & West, 2003). Further, we retained only one of these two variables and reran the regression analyses. There were no meaningful differences that would change our substantive conclusions regarding the criterion-related validity and the moderating results.

involved in dying frightens me.” We followed the recommendation of the authors of the scale and used the composite score ( $\alpha = .86$ ).

## Results

We conducted a CFA to assess the fit of the five-factor model of death reflection, which provided an adequate fit to the data ( $\chi^2 = 242.90$ ,  $df = 80$ ,  $CFI = .92$ ,  $SRMR = .05$ ). Again, the higher-order model fit significantly worse ( $\chi^2 = 274.63$ ,  $df = 85$ ,  $CFI = .90$ ,  $SRMR = .06$ ,  $\Delta\chi^2(5) = 31.73$ ,  $p < .01$ ). The descriptive statistics for all study variables and correlations are reported in Table 4. Importantly, the correlation between death anxiety and death reflection was negative but not significant ( $r = -.07$ ,  $p = .24$ ), thereby supporting the distinctiveness of these two constructs.<sup>5</sup> Further, both age ( $r = .16$ ,  $p < .01$ )<sup>6</sup> and mortality cues ( $r = .41$ ,  $p < .01$ ) were positively related to death reflection. Occupational tenure was not related to death reflection ( $r = .00$ ,  $p = .97$ ). Death reflection was not significantly related to safety performance ( $r = .09$ ,  $p = .12$ )<sup>7</sup> but was positively related to life satisfaction ( $r = .18$ ,  $p < .01$ ).

We conducted a set of hierarchical regression analyses to test our hypotheses regarding the criterion-related validity and the moderating effect of death reflection. Following previous research arguing that there is value in focusing on both individual factors and composite scores (Judge, Rodell, Klinger, Simon, & Crawford, 2013; LePine, Erez, & Johnson, 2002), we used a comprehensive approach to testing the criterion-related validity of death reflection. Specifically,

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<sup>5</sup> Given the near-zero relationship between death anxiety and death reflection, we did not control for death anxiety in regression analysis, following a reviewer’s suggestion.

<sup>6</sup> Similar to Study 3, we also checked for the non-linear relation between age and death reflection, which was again non-significant (the unstandardized coefficient of the square term of age:  $B = .00$ ,  $ns$ ).

<sup>7</sup> Following a reviewer’s suggestion, we also tested the relationship between death reflection and safety performance components: Its correlation with safety compliance was .09 ( $ns$ ) whereas its correlation with safety citizenship behaviors was .10 ( $ns$ ). The difference between these two correlations was not significant ( $z = .29$ ,  $p = .77$ ; Lee & Preacher, 2013).

we first conducted a series of regression analyses where each dimension was entered separately to predict life satisfaction (Table 5) and safety performance (Table 6). Then we put all five dimensions together to predict the criterion variables. Additionally, we also used the death reflection composite score as a single predictor. When entered individually, Putting Life in Perspective ( $B = .11, p < .05$ ), Connection to Others ( $B = .23, p < .05$ ), Legacy ( $B = .14, p < .05$ ), as well as the composite ( $B = .20, p < .01$ ), were significant predictors of life satisfaction. When the effects of other dimensions were controlled, Connection to Others was the only significant predictor ( $B = .24, p < .05$ ). When predicting safety performance, Connection to Others was the only significant predictor, whether when it was entered alone ( $B = .21, p < .05$ ) or together with other dimensions ( $B = .29, p < .05$ ). Overall, Hypothesis 1 received strong support whereas Hypothesis 2 was only supported regarding the dimension of Connection to Others.

Prior to conducting the moderation analyses, death reflection and mortality cues were grand mean-centered to avoid nonessential multicollinearity and increase interpretability of the moderating effect (Cohen, Cohen, Aiken, & West, 2003; Dalal & Zickar, 2012). Similar to testing criterion-related validity, we used both death reflection dimensions and the composite as the moderator in moderation analyses. Regarding the moderating role of death reflection in the relation between mortality cues and life satisfaction (Table 7), none of the moderation terms were significant. Therefore, Hypothesis 3 was not supported. When predicting safety performance (Table 8), the moderating effects based on dimensions (Motivation to Live:  $B = .21, p < .05$ ; Putting Life in Perspective:  $B = .20, p < .05$ ; Connection to Others:  $B = .27, p < .01$ ; Legacy:  $B = .32, p < .01$ ) and the composite ( $B = .36, p < .01$ ) yielded similar significant results, with the exception that the moderating effect based on Motivation to Help was not significant. As the patterns of the significant moderating results were similar, we interpreted the moderating

effect based on the composite. Simple slope analyses showed that the effect of mortality cues on safety performance was strongly negative ( $B = -.44, p < .01$ ) when death reflection was low, whereas it became non-significant when death reflection was high ( $B = .00, p = .98$ ). We further plotted out this buffering effect of death reflection in Figure 1. Therefore, Hypothesis 4 received support.

### Discussion

Studying the prosocial aspects of death awareness holds great promise to address the over-emphasis on the anxiety-provoking aspects of death cognition and extend a wide range of OB topics such as stress and well-being (Sliter et al., 2014), turnover (Lee et al., 2017), job characteristics (Goštautaitė & Bučiūnienė, 2015), volunteering (Grant, 2012), and leadership (Zacher et al., 2011). However, the lack of a validated scale hinders scholarly attempts to incorporate death reflection into OB research. Accordingly, we provided a formal conceptualization of death reflection, developed and validated a scale over four studies, and show that death reflection buffers the relationship between mortality cues and safety performance among a sample of firefighters.

Across four samples, we found robust support for a five-factor model of death reflection. Consistent with our conceptualization of death reflection, the five factors (i.e., Motivation to Help, Motivation to Live, Putting Life in Perspective, Connection to Others, and Legacy) consist of detailed and concrete forms of processing that are focused on realizing the positive aspects of mortality. Further, death reflection was distinct from other theoretically relevant constructs in Study 3. For example, it did not demonstrate heavy overlap with the broad form of trait reflection. Moreover, in line with the contingency model of death awareness (Grant & Wade-Benzoni, 2009), we found little overlap between death reflection and death anxiety in Study 4.

This lends support to the distinctiveness between the anxiety provoking and the more deliberate, reflective aspects of death cognitions. In a time-lagged design separated by three weeks, death reflection had acceptable test-retest reliability comparable to other types of reflective cognition (Treyner et al., 2003). In a sample of firefighters, we also found evidence for its criterion-related validity. Taken together, our findings provide preliminary support for the psychometric properties of the newly developed Death Reflection Scale, suggesting it can be a useful survey instrument for future research.

Further, our findings also have important implications for research on death-related cognitions. As noted earlier, the vast majority of death awareness research has focused on its anxiety-provoking aspects (Greenberg et al., 2008; Vail et al., 2012). In Study 4, we found minimal overlap between death anxiety and death reflection, consistent with the theoretical proposition from Grant and Wade-Benzoni (2009) that death anxiety and death reflection are processed through different cognitive systems. On this regard, our findings suggest that omitting death reflection from death awareness research would present an imbalanced and incomplete picture of death-related cognitions, reducing individuals to self-focused beings that are only concerned with self-preservation. In alignment with the broader literature on self-awareness (Trapnell & Campbell, 1999) and cognitive processing (Watkins, 2008), our findings highlight that the prosocial aspects of death awareness hold the key to understanding people's constructive reactions to death-related thoughts. In other words, death reflection should be an integral component to a comprehensive understanding of death-related cognitions.

Additionally, we took an important first step in substantiating the buffering effect of death reflection in the relation between mortality cues and firefighters' safety performance. Specifically, firefighters high in death reflection had a near-zero relationship between mortality

cues and safety performance whereas those low in death reflection demonstrated decreased safety performance, suggesting that death reflection can act as a buffer and minimize the detrimental impact of mortality cues on firefighters. We found preliminary evidence that death reflection has important implications for scholarly understanding of important workplace phenomena in the context of firefighting. This finding also illustrates the general value of death-related topics for the OB literature. We contribute to the workplace safety literature by highlighting the interplay between death-related situation (i.e., mortality cues) and person (i.e., death reflection) variables in influencing firefighter safety performance. Given the prevalence of death awareness issues in many occupations, we believe other streams of OB research will greatly benefit from incorporating death reflection as well.

It is also worth noting that we took a comprehensive approach to assessing the criterion-related validity and the moderating effect of death reflection, using both its dimensions and the composite score. Various scholars have noted that both approaches could prove useful in empirical research (e.g., Judge et al., 2013; LePine et al., 2002). On one hand, using the composite can help researchers cover the construct space of the prosocial aspects of death awareness parsimoniously (Neimeyer, Wittkowski, & Moser, 2004; Thorson & Powell, 1992). On the other hand, focusing on certain dimensions may also prove useful depending on the specific research question. We note the conceptual richness of the five dimensions of death reflection: Motivation to Help involves prosocial intentions to be generous and helpful toward other people in general whereas Connection to Others is mainly concerned with one's bonds with close others (e.g., "people I care about"). Motivation to Live entails a more proactive mindset regarding one's instant future (e.g., "things I still want to do") whereby Legacy taps into the positive impact that one will have left behind. Additionally, Putting Life in Perspective appears

to be closely related to cognitive appraisal, where an individual can interpret the hassles in life from a different lens.

We also note some interesting findings that were not of primary interest to our research purpose. First, mortality cues were positively related to death reflection in Study 4. This finding is consistent with Lykins et al. (2007), who suggested that “when people counter death over a longer period of time ... they move to transcend their defensiveness” (p. 1097). Additionally, this suggests that death reflection is highly relevant for occupational settings that involve chronic exposure to mortality cues (e.g., firefighting; critical care nursing). Second, death reflection was positively correlated with age in the firefighter sample.<sup>8</sup> Although it is not desirable to draw a firm conclusion from one sample, the substantial relationship nonetheless points to the need to incorporate death reflection in relevant OB topics such as retirement and aging.

### **Limitations and Future Research Directions**

We note a few limitations that present interesting opportunities for future research. First, although the time-lagged design can help to reduce common method variance (Podsakoff, MacKenzie, & Podsakoff, 2012), we cannot rule out alternative causal explanations with our correlational study design in Study 4. For example, life satisfaction may also lead to increased death reflection. Similarly, working in a safe manner may make it less likely for firefighters to experience mortality cues at work. Future research utilizing an experimental design will be better able to disentangle the dynamic relationships between these variables. However, in Study 3, we did not intend to make any causal inferences regarding the relationship between death reflection

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<sup>8</sup> The correlation between age and death reflection was not significant in the other three studies (Study 1:  $r = -.03$ , *ns*; Study 2:  $r = -.01$ , *ns*; Study 3:  $r = -.09$ , *ns*).

and its theoretical correlates measured at different time points. Rather, our goal was to establish the nomological network of death reflection while also trying to reduce common method bias.

Second, self-report measures were used in all studies. Although this is deemed appropriate for most of our study variables that involve self-focused cognitions and personality traits, the use of self-reported safety performance may introduce common method variance concerns. In that regard, we used a temporal lag to help reduce its potential impact. Further, we note that objective safety outcomes often have other problems such as low base rates and inaccurate organizational record keeping (Hofmann & Mark, 2006). Recent evidence suggests that employees are more likely to report engaging in undesirable work behaviors than are observers, which suggests supervisor-reported safety performance may be deficient (Berry, Carpenter, & Barratt, 2012). Therefore, while self-reported safety performance should be considered as a viable option, we also encourage researchers to incorporate criterion variables measured through different sources in the future.

Third, we sampled a group of firefighters when examining the criterion validity of death reflection. Although this occupation represents a high-risk job context where death reflection plays an important role, the specific features of this job (e.g., intensity of and frequent exposure to traumatic stressors) may have limited the generalizability of our findings. For example, in occupations where mortality cues may be a necessary, but unexpected, aspect of the job (Mooney, 2005), the moderating effect of death reflection may be even stronger. In accordance with our overarching goal in this research, we encourage scholars to extend death reflection to a broader range of employee outcomes in different occupational contexts in their future work. For example, death reflection may serve to improve employee sleep, reduce substance abuse, and promote physical health (e.g., cardiovascular functioning) as people high in death reflection are

motivated to live better. In terms of work behaviors, death reflection may be associated with prosocial behaviors such as organizational citizenship behaviors and willingness to mentor (Grant & Wade-Benzoni, 2011). It may also act to reduce undesirable work behaviors such as workplace deviance and discrimination. Death reflection may also be relevant for specific working populations such as those who choose to participate in bridge employment after retirement as a way to give back to the society (Kim & Feldman, 2000). As people high in death reflection are motivated to maintain meaningful connections with close others, it can also influence employees' behaviors at home, and how they manage their work-family interface. Moreover, in addition to serving as an independent variable, death reflection could be an important criterion in itself. Pinpointing the factors that foster death reflection will help researchers and practitioners develop interventions.

Consistent with our trait-like conceptualization of death reflection, we did not specify whose death in the items on the Death Reflection Scale, as the defining component of death reflection is the deep level of processing of mortality, not the source of mortality. Although thinking about one's own death may elicit greater "hot" reactions such as anxiety and threat, as supported in TMT (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994), this may not be the case for death reflection that involves the "cool" information processing system. Further, the dimensions of death reflection suggest that it reflects a comprehensive processing of mortality, covering aspects associated with the self (e.g., motivation to live; putting live in perspective) and others (e.g., motivation to help). Further, pragmatically speaking, this distinction may be less pronounced in reality given that many jobs (e.g., firefighting) involve danger to both the self and others. Nonetheless, this could be a direction that might be fruitful for future inquiries.

### **Implications for Practice**

Because of their occupations, many people, such as healthcare and law enforcement employees, experience death and death-related issues as a salient stressor at work. Accordingly, we encourage management and policy makers to recognize that mortality cues are pertinent job stressors that often fall outside of employees' control. As a result, employees need continuous support in order to process and cope with death-related job stressors. Such resources should be an integral component of employee assistance programs. Moreover, for these employees, we recommend training that helps to increase death reflection. Although interventions designed to increase death reflection have not yet been developed, recent work on mindfulness training (Jamieson & Tuckey, 2017) could be adapted to the context of death-related education and training. Specifically, its explicit focus on concrete processing of the present (Brown & Ryan, 2003) and the newly-expanded incorporation of social connectedness (Van Doesum, Van Lange, & Van Lange, 2013) fit nicely with some of the defining features of death reflection. Therefore, organizations can consider incorporating mindfulness training into their death-related education and training programs. Finally, as Sliter et al. (2014) note, because attitudes toward death may be difficult to change in a shorter time span (Rasmussen, Templer, Kenkel, & Cannon, 1998), death educational programs should be long-term, intensive, and participative in order to be effective (Mooney, 2005).

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Table 1

## Items and Factor Loadings from Exploratory and Confirmatory Factor Analyses

Factors and Items	EFA (Study 1)					CFA (Study 2)				
	1	2	3	4	5	1	2	3	4	5
<b>1. Motivation to Help</b>										
When I think about death, I feel like I should do more for the world.	<b>.71</b>	.10	-.09	.14	-.08	<b>.73</b>				
When I think about death, I feel a strong urge to help other people.	<b>.91</b>	-.08	.01	-.05	.04	<b>.79</b>				
When I think about death, I want to be a more generous person.	<b>.80</b>	-.01	.06	-.04	.09	<b>.81</b>				
<b>2. Motivation to Live</b>										
When I think about death, I make plans for my life.	.03	<b>.58</b>	.11	.02	.08		<b>.73</b>			
When I think about death, I reflect on the things I still want to do.	-.09	<b>.78</b>	-.09	.00	.03		<b>.63</b>			
When I think about death, I am motivated to try new things.	.09	<b>.66</b>	.07	-.03	-.07		<b>.73</b>			
<b>3. Putting Life in Perspective</b>										
When I think about death, I can let go of the little problems.	-.01	.05	<b>.73</b>	-.01	.07			<b>.91</b>		
When I think about death, I am able to stop sweating the small stuff.	-.04	-.04	<b>.94</b>	-.02	-.02			<b>.83</b>		
When I think about death, I am less stressed about the things that are bothering me.	.05	-.01	<b>.68</b>	.07	-.06			<b>.67</b>		
<b>4. Legacy</b>										
When I think about death, I think about what legacy I will have left behind.	.16	.05	-.03	<b>.66</b>	-.08				<b>.82</b>	
When I think about death, I reflect on whether people will think of me after death.	-.09	-.02	.01	<b>.87</b>	.06				<b>.81</b>	
When I think about death, I reflect on how I will be remembered.	-.01	-.04	.03	<b>.91</b>	.02				<b>.89</b>	
<b>5. Connection to Others</b>										
When I think about death, I want to spend more time with the people I care about.	-.04	.05	-.04	.01	<b>.91</b>					<b>.90</b>
When I think about death, I want to tell the people I care about how I feel about them.	.04	-.01	.02	.06	<b>.75</b>					<b>.76</b>
When I think about death, I want to spend more time with my family.	.04	-.04	.00	-.04	<b>.83</b>					<b>.81</b>
% of variance explained	5.23	4.30	8.58	10.57	36.18	-	-	-	-	-
Cronbach's alpha value	.86	.74	.82	.86	.88	.82	.73	.84	.86	.87
Mean	3.72	4.23	3.57	3.92	4.55	3.82	4.26	3.50	4.00	4.60
SD	1.17	0.96	1.14	1.20	1.14	1.08	0.94	1.20	1.21	1.06

Table 2

Descriptive Statistics and Correlations among Latent Factors (Study 2)

	<i>Mean</i>	<i>SD</i>	1	2	3	4	5
1. Motivation to help	3.82	1.08	.82				
2. Motivation to live	4.26	0.94	.65**	.73			
3. Putting life in perspective	3.50	1.20	.47**	.47**	.84		
4. Connection to others	4.60	1.06	.61**	.63**	.34**	.86	
5. Legacy	4.00	1.21	.51**	.55**	.14*	.48**	.87

*Note.*  $n = 380$ . *SD* = Standard Deviation. Cronbach's alpha values are italicized along the diagonal where applicable.

\*  $p < .05$ ; \*\*  $p < .01$ .

Table 3

Descriptive Statistics and Correlations among Study Variables (Study 3)

	<i>Mean</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Age	20.20	1.91																		
2. Motivation to help	3.71	0.82	-.07	.83																
3. Motivation to live	3.79	0.77	-.10	.72**	.72															
4. Putting life in perspective	3.13	1.00	.06	.44**	.46**	.83														
5. Connection to others	3.84	0.87	-.12	.65**	.61**	.28**	.86													
6. Legacy	4.08	0.82	-.13	.69**	.74**	.35**	.59**	.86												
7. Death reflection	3.71	0.68	-.09	.87**	.87**	.66**	.78**	.83**	.92											
8. Motivation to help (T2)	3.81	0.80	-.08	.58**	.54**	.29**	.42**	.50**	.58**	.84										
9. Motivation to live (T2)	3.86	0.80	-.09	.53**	.58**	.32**	.42**	.50**	.58**	.78**	.79									
10. Putting life in perspective (T2)	3.39	0.95	-.03	.40**	.43**	.52**	.22**	.36**	.49**	.53**	.60**	.84								
11. Connection to others (T2)	3.93	0.87	-.10	.46**	.42**	.15	.60**	.46**	.51**	.64**	.60**	.24**	.89							
12. Legacy (T2)	4.09	0.82	-.06	.49**	.52**	.20**	.41**	.67**	.56**	.68**	.68**	.38**	.64**	.89						
13. Death reflection (T2)	3.81	0.68	-.09	.61**	.61**	.38**	.51**	.61**	.67**	.89**	.90**	.69**	.76**	.82**	.93					
14. Trait reflection	4.78	1.34	.07	.28**	.32**	.16*	.20**	.14	.27**	.20*	.26**	.14	.13	.13	.24**	.86				
15. Trait rumination	4.93	1.34	.02	.12	.08	-.12	.15	.03	.06	.11	.13	-.01	.20*	.08	.12	.33**	.89			
16. Openness to experience	5.14	1.12	.01	.01	.13	.02	.05	.05	.06	.07	.17*	.05	.04	.04	.09	.39**	.10	.79		
17. Relational self	5.44	0.83	-.03	.21**	.22**	-.03	.19*	.28**	.21**	.21**	.26**	.08	.18*	.19*	.23**	.26**	.19*	.28**	.87	
18. Prosocial identity (T2)	4.21	0.72	-.06	.19*	.15*	-.04	.06	.19*	.13	.22**	.21**	.19*	.18*	.15*	.23**	.10	.08	.07	.40**	.88

*Note.*  $n = 169$ . *SD* = Standard Deviation. Variables measured at Time 2 are indicated in the parentheses. Cronbach's alpha values are italicized along the diagonal where applicable.

\*  $p < .05$ ; \*\*  $p < .01$ .

Table 4

## Descriptive Statistics and Correlations among Study Variables (Study 4)

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	32.81	6.57												
2. Occupational tenure	7.30	7.12	.74**											
3. Motivation to help	3.38	0.79	.05	-.02	.79									
4. Motivation to live	3.34	0.74	.16**	.05	.63**	.77								
5. Putting life in perspective	3.34	0.77	.06	-.07	.70**	.58**	.79							
6. Connection to others	3.34	0.73	.21**	.05	.52**	.58**	.53**	.75						
7. Legacy	3.35	0.74	.18**	.01	.55**	.60**	.51**	.62**	.79					
8. Death reflection	3.35	0.62	.16**	.00	.84**	.83**	.82**	.79**	.80**	.92				
9. Death anxiety	2.98	0.26	-.24**	-.19**	.02	-.10	.01	-.12	-.12	-.07	.86			
10. Mortality cues	3.09	1.03	-.24**	-.36**	.35**	.29**	.36**	.29**	.35**	.41**	.00	.97		
11. Safety performance (T2)	4.99	0.97	.17**	.16*	.03	.06	.04	.18**	.08	.09	-.06	-.15*	.96	
12. Life satisfaction (T2)	3.39	0.66	.11	.13*	.10	.10	.12	.25**	.15*	.18**	-.22**	.14*	.37**	.80

Note.  $n = 268$ .  $SD$  = Standard Deviation. Variables measured at Time 2 are indicated in the parentheses. Cronbach's alpha values are italicized along the diagonal where applicable.

\*  $p < .05$ ; \*\*  $p < .01$ .

Table 5

## Death Reflection Predicting Life Satisfaction (Study 4)

Variables	DV: Life Satisfaction													
	Single Factor		Single Factor		Single Factor		Single Factor		Single Factor		Simultaneous		Composite	
	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>
Intercept	2.96**	.30	2.95**	.29	2.91**	.29	2.72**	.27	2.92**	.28	2.76**	.30	2.73**	.30
Age	.00	.01	.00	.01	.00	.01	-.01	.01	.00	.01	-.01	.01	.00	.01
Occupational Tenure	.01	.01	.01	.01	.01	.01	.02	.01	.01	.01	.02	.01	.01	.01
Motivation to help	.09	.05									-.03	.08		
Motivation to live			.08	.06							-.06	.08		
Putting life in perspective					.11*	.05					.03	.08		
Connection to others							.23*	.06			.24*	.07		
Legacy									.14*	.06	.02	.07		
DR Composite													.20**	.07
<i>R</i> <sup>2</sup>	.03		.03		.03		.08		.04		.08		.05	
<i>F</i>	2.47		2.52		3.03*		7.45**		3.53*		3.23**		4.46**	

Note.  $n = 268$ . Unstandardized coefficients reported. *S.E.* = Standard Error. DR Composite = Death Reflection Composite.  
 \*  $p < .05$ ; \*\*  $p < .01$ .

Table 6

## Death Reflection Predicting Safety Performance (Study 4)

Variables	DV: Safety Performance													
	Single Factor		Single Factor		Single Factor		Single Factor		Single Factor		Simultaneous		Composite	
	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>
Intercept	4.21**	.43	4.13**	.42	4.19**	.43	3.87**	.41	4.16**	.42	4.04**	.44	4.01**	.44
Age	.02	.01	.02	.01	.02	.01	.01	.01	.02	.01	.01	.01	.02	.01
Occupational Tenure	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
Motivation to help	.04	.07									-.04	.11		
Motivation to live			.05	.08							-.03	.11		
Putting life in perspective					.04	.08					-.04	.11		
Connection to others							.21*	.08			.29*	.11		
Legacy									.07	.08	-.04	.11		
DR Composite													.12	.10
<i>R</i> <sup>2</sup>	.03		.04		.03		.06		.03		.06		.04	
F	2.99*		3.36*		3.02*		5.17**		3.15*		2.44*		3.46*	

Note.  $n = 268$ . Unstandardized coefficients reported. *S.E.* = Standard Error. DR Composite = Death Reflection Composite.  
 \*  $p < .05$ ; \*\*  $p < .01$ .

Table 7

## Moderation Results for Life Satisfaction (Study 4)

DV: Life Satisfaction												
Variables	Death Reflection Dimension										Death Reflection Composite	
	Motivation to help		Motivation to live		Putting life in perspective		Connection to others		Legacy		B	S.E.
	B	S.E.	B	S.E.	B	S.E.	B	S.E.	B	S.E.		
Intercept	3.18**	.26	3.15**	.26	3.21**	.26	3.39**	.26	3.24**	.26	3.27**	.26
Age	.00	.01	.00	.01	.00	.01	-.01	.01	.00	.01	.00	.01
Occupational Tenure	.02*	.01	.02†	.01	.02*	.01	.02*	.01	.02*	.01	.02*	.01
Mortality Cues	.12*	.04	.12**	.04	.11*	.04	.07†	.04	.10*	.05	.09†	.05
Death Reflection Dimension	.04	.06	.03	.06	.07	.06	.23**	.06	.10†	.06	.15*	.08
Death Reflection Dimension × Mortality Cues	.05	.06	.01	.06	.02	.06	.09	.06	.08	.06	.08	.07
$\Delta R^2$	.00		.00		.00		.01		.01		.00	
$R^2$	.06		.06		.06		.10		.07		.07	
F	3.19**		3.17**		3.26**		5.86**		3.78**		3.87**	

Note.  $n = 268$ . Unstandardized coefficients reported. *S.E.* = Standard Error.  $\Delta R^2$  refers to the incremental contribution of the interaction between morality cues and death reflection dimension.

†  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ .

Table 8

## Moderation Results for Safety Performance (Study 4)

Variables	DV: Safety Performance											
	Death Reflection Dimension										Death Reflection Composite	
	Motivation to help		Motivation to live		Putting life in perspective		Connection to others		Legacy		B	S.E.
	B	S.E.	B	S.E.	B	S.E.	B	S.E.	B	S.E.	B	S.E.
Intercept	4.30**	.38	4.28**	.38	4.29**	.38	4.59**	.38	4.36**	.38	4.39**	.38
Age	.02	.01	.02	.01	.02	.01	.01	.01	.01	.01	.01	.01
Occupational Tenure	.00	.01	.00	.01	.00	.01	.01	.01	.01	.01	.01	.01
Mortality Cues	-.16*	.07	-.16*	.06	-.16*	.06	-.21**	.06	-.19**	.06	-.22**	.07
Death Reflection Dimension	.15†	.08	.17*	.09	.19*	.09	.40**	.09	.26**	.09	.38**	.11
Death Reflection Dimension × Mortality Cues	.16†	.09	.21*	.08	.20*	.08	.27**	.09	.32**	.09	.36**	.10
$\Delta R^2$	.01		.02		.02		.03		.05		.04	
$R^2$	.06		.08		.07		.12		.10		.10	
F	3.43**		4.26**		4.03**		6.97**		5.89**		6.02**	

Note.  $n = 268$ . Unstandardized coefficients reported. *S.E.* = Standard Error.  $\Delta R^2$  refers to the incremental contribution of the interaction between morality cues and death reflection dimension.

†  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ .

Figure 1

Moderating Effect of Death Reflection on Safety Performance

