

Research Report

Death, Life, Scarcity, and Value

An Alternative Perspective on the Meaning of Death

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ABSTRACT—*That the scarcity of objects enhances their value is a widely known principle in the behavioral sciences. In addition, research has demonstrated that attaching high value to an object produces biased perceptions of its scarcity. Three studies applied this bidirectional link between scarcity and value to the meaning of death, testing the prediction that death represents the scarcity of life. In Study 1, reminders of death led to enhanced evaluations of life. In Studies 2 and 3, the monetary (Study 2) and psychological (Study 3) value of life were manipulated. In both studies, when human life was highly valuable, the concept of death was more accessible, as predicted from the association between value and scarcity. Previous theoretical treatments of the meaning of death have shared the notion that death is essentially a threat requiring psychological defenses. The present results suggest that, from an informational perspective, death represents the scarcity of life.*

Anecdotal accounts of individuals who have experienced brushes with death suggest that they often experience a renewed appreciation of life's value (e.g., Zamora, 2006). Such experiences are readily explained by the scarcity heuristic, which dictates that commodities that are rare (or likely to be lost) are likely to be perceived as valuable. Life itself emerges with enhanced value after people confront its fragile and finite nature.

Dai, Wertenbroch, and Brendl (2008) recently demonstrated that the link between scarcity and value is so overlearned that its converse also holds. In that study, participants who were given a large monetary reward for identifying a particular class of stimuli tended to underestimate its frequency. Not only are scarce objects likely to be valued, but when an object is highly valued, it is likely to be perceived as scarce, an effect Dai et al. termed the *value heuristic*.

Underlying both the scarcity and the value heuristics is the strong cognitive link between scarcity and value. Both of these

heuristics demonstrate that subjective estimates of a distal attribute of a stimulus (e.g., its value) can rely on available information about another attribute (e.g., its scarcity), and this substitution is based on the presumed covariation of these attributes (Kahneman & Fredrick, 2002). Thus, when information about scarcity is accessible, it might be used in evaluations of value. When information about value is accessible, it might be used in evaluations of scarcity. The bidirectional operation of these heuristics attests to the very strong presumed covariation of scarcity and value. Clearly, scarcity and value share a robust cognitive association.

Applying this link to death and life, we propose that death (essentially the termination of life) serves as a reminder that life is a potentially losable commodity. As such, death represents the scarcity of life and should, therefore, share a strong relationship with life's value. Such a conceptualization leads to two innovative predictions. First, just as the scarcity of any object renders that object more valuable, reminders of death (the scarcity of life) should render life more valuable. Second, just as attaching high value to an object automatically promotes the accessibility of the closely linked concept of its scarcity, promoting the value of life should make the concept of death more cognitively accessible. We now briefly contrast this conceptualization with other approaches to the meaning of death, highlighting the differing predictions that emerge from our approach.

PERSPECTIVES ON THE MEANING OF DEATH

Terror management theory (TMT; Solomon, Greenberg, & Pyszczynski, 1991) posits that humans are uniquely aware of their own mortality and asserts that a variety of social mechanisms (e.g., cultural worldviews) have evolved as defensive buffers against the terror inspired by this existential dilemma. Many studies have demonstrated that when individuals are reminded of their own mortality, they utilize these buffers unconsciously in a variety of ways (e.g., Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). These defensive processes occur after a delay, when death is no longer in focal awareness. Immediately following mortality salience, individuals may instead engage in conscious "pseudo-

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rational efforts” to defend against death (e.g., consciously espousing conventional mores—Kosloff & Greenberg, 2009). It is to these immediate responses that the scarcity heuristic would clearly apply, suggesting that they are not in fact defensive, but follow from the association of scarcity with value.

In contrast to TMT, the meaning-maintenance model (MMM; Heine, Proulx, & Vohs, 2006) views death as a threat to meaning; mortality-salience effects are encompassed under the rubric of meaning reinstatement. Contrary to the MMM, the scarcity heuristic suggests that reminders of death automatically enhance the value of life. To the extent that it represents the finite quality of life, the reality of death might well make life *more* meaningful (not less so).

TMT and MMM share two assumptions: that death is, primarily, a threat and that responses to death are expressions of motivated, defensive processes. These assumptions have become an integral part of psychology’s understanding of the meaning of death, leading to an application of defensiveness as a general explanation for all responses to death (even enhanced implicit positive affect—see DeWall & Baumeister, 2007). In contrast, we suggest that death is not (only) a source of terror or meaninglessness and that at least some responses to death can be explained without resorting to motivated defenses. Because it represents life’s scarcity, death may be cognitively linked with life’s value. When death (or life’s scarcity) is salient, life is, simply, better. Further, when life is highly valued, its scarcity (death) may be rendered more cognitively accessible.

Study 1 examined the prediction that reminders of the scarcity of life (i.e., death) would promote its value. Studies 2 and 3 examined the opposite prediction, which does not follow parsimoniously from either TMT or MMM, that enhancing life’s value would automatically increase the cognitive accessibility of death (i.e., life’s scarcity).

STUDY 1

In Study 1, participants were exposed to death-related or control words and then completed measures of meaning in life and life satisfaction. We predicted that reminders of life’s scarcity (death) would lead to higher evaluations. Participants (281 undergraduates; 57% women) were randomly assigned to complete one of two word-find puzzles on-line. In the experimental condition ($n = 112$), the words embedded in the puzzle were death related (e.g., *dead*, *tombstone*). In the control condition ($n = 169$), they were pain related (e.g., *pain*, *headache*). Participants then completed three established measures of meaning in life: Krause’s (2007) scale, items adapted from the Purpose in Life test (PIL; Crumbaugh & Maholick, 1964; Hicks & King, 2008), and the Presence of Meaning subscale from the Meaning in Life Questionnaire (MLQ; Steger, Frazier, Oishi, & Kaler, 2006). Finally, they completed the Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). Items on

all measures were rated on a scale from 1 (*not at all*) to 7 (*extremely much*).

A multivariate analysis of variance demonstrated a significant multivariate effect of condition (Wilks’s $\lambda = .93$), $F(4, 273) = 5.49$, $p < .0001$; $p_{\text{rep}} > .996$. All univariate effects were significant, $F_s(1, 276) = 4.98\text{--}17.00$, $d_s = .27\text{--}.48$. As predicted, after exposure to reminders of death, evaluations of life were uniformly more positive (Krause: $M_{\text{death}} = 5.14$, $M_{\text{control}} = 4.68$; PIL: $M_{\text{death}} = 5.47$, $M_{\text{control}} = 5.19$; MLQ: $M_{\text{death}} = 4.72$, $M_{\text{control}} = 4.36$; SWLS: $M_{\text{death}} = 5.01$, $M_{\text{control}} = 4.46$).

In order to determine whether these results were specific to the association between death and evaluations of life, we asked a supplemental sample of 89 participants to complete the same word-find puzzles on-line and then evaluate a variety of products (e.g., toasters, cell phones, alarm clocks). Results showed that reminders of death did not enhance the evaluations of these products, all $t_s(87) < 1.0$, all $p_s > .50$ (see Kasser & Sheldon, 2000, for similar null results for evaluations of non-life-related possessions following mortality salience).

The results of Study 1 are quite parsimoniously explained by the scarcity heuristic: Reminders of life’s scarcity enhance its value. Still, these findings might be explained (albeit less parsimoniously) by defensive processes; that is, evaluating one’s life as meaningful or particularly satisfying might serve as coping with the terror of death (DeWall & Baumeister, 2007), as a conscious effort to fend off death anxiety (Kosloff & Greenberg, 2009), or as compensation for the sense of meaninglessness fostered by thoughts of death (Heine, Proulx, & Vohs, 2006). Such explanations would require that the death-related words in the puzzles, despite leading to higher evaluations of life, nevertheless were experienced as threatening and elicited conscious or automatic defenses.

Given the bidirectional cognitive association between scarcity and value, promoting the value of an object should automatically heighten the cognitive accessibility of its scarcity. Thus, to further explore the possibility that the relationship between scarcity and value explains the effects observed in Study 1, in Studies 2 and 3 we manipulated life’s value. In both studies, participants were randomly assigned to conditions in which a high or low value of life was suggested or to a control group. The dependent measure was the cognitive accessibility of death, measured via word completions. Our use of this dependent measure relied on the notion that death represents the scarcity of life. On the basis of the link between value and scarcity, we predicted that the cognitive accessibility of death would be highest among participants in the high-value conditions.

Our operational definition of life’s scarcity (cognitive accessibility of death) allowed for a direct examination of alternative predictions from TMT. Specifically, within TMT, the death-thought-accessibility hypothesis holds that information that challenges one’s worldview should lead to heightened accessibility of death-related thoughts (Schimmel, Hayes, Williams, & Jahrig, 2007). According to this hypothesis, if our low-value

manipulations (Study 2: being told that a human body is worth the same as a Big Mac Extra Value Meal; Study 3: writing about how human life is not meaningful) challenged preexisting worldviews, the concept of death would be most accessible in the low-value conditions and least accessible in the high-value conditions—the opposite of our prediction.

STUDY 2

In Study 2, 86 adults (50% women) were approached in various public places in Columbia, Missouri, and invited to complete a short questionnaire in return for a piece of candy. Participants were randomly assigned to one of three conditions. In the high-value condition ($n = 28$), they read a passage that included an itemized list giving the value of various bodily organs, describing the total monetary value of a human body as \$45 million, the equivalent of “400 Porsches, 265 houses, [or] 45 luxury yachts.” In the low-value condition ($n = 32$), participants read a similar passage giving an itemized list of the chemicals in the body, describing the total monetary value of a human body as \$4.50, the equivalent of “a Big Mac Extra Value Meal at McDonald’s.” (Both descriptions were technically accurate.) In the control condition ($n = 26$), no passage was presented. On the back of the page, all participants completed a 25-item word-completion task. Five of the items could be completed with death-related words (e.g., “coff_” could be completed as “coffee” or “coffin”; “de_” could be completed as “deal” or “dead”).

A one-way analysis of variance on the number of word completions that were death related (*death completions*) was significant, $F(1, 83) = 4.0, p < .05, p_{rep} > .89$. A planned polynomial contrast examining whether the high-value condition (+2) led to more death completions than the low-value (−1) or control (−1) conditions was also significant, $t(83) = 2.06, p < .05, p_{rep} > .89, d = 0.45$. Individuals who read the passage describing life as particularly valuable produced significantly more death completions ($M = 2.30$) than participants in the low-value ($M = 1.84$) and control ($M = 1.70$) groups, as predicted by the association between value and scarcity.

Because the manipulation in Study 2 was rather unusual, we conducted Study 3 in an attempt to conceptually replicate these results with a manipulation of life’s psychological value. Once again, we predicted that promoting life’s value would lead to the heightened cognitive accessibility of its scarcity, death.

STUDY 3

At the end of a psychology class, 133 undergraduates (60% women) were randomly assigned to one of three conditions. Participants in the high-value ($n = 50$) and low-value ($n = 43$) conditions wrote for approximately 3 min about how the statement “Human life is purposeful and meaningful” was true or not true, respectively. They then completed the same word fragments from Study 2. Participants in the control condition

($n = 40$) did not write an essay before completing these word fragments. A one-way analysis of variance on death completions was significant, $F(2, 129) = 8.99, p < .001, p_{rep} > .98$, as was the predicted contrast, $t(129) = 4.23, p < .001, p_{rep} > .98, d = 0.74$; the number of death completions was significantly higher in the high-value condition ($M = 2.0$) than in the other two conditions (both $M_s = 1.20$). Notably, the mean numbers of death completions for the high-value groups in both Studies 2 and 3 are on par with those reported in response to worldview challenges (Schimmel et al., 2007).

DISCUSSION

These results demonstrate the operation of the cognitive association between scarcity and value in evaluations of life and the accessibility of death. Reminders of death enhance life’s value, and placing a high value on life enhances the cognitive accessibility of death. These results support the contention that death is a reminder that life is a limited and valuable commodity—in short, that death represents life’s scarcity. Although the operation of these cognitive mechanisms in response to death has not been previously considered, they provide an innovative and parsimonious framework for understanding at least some of the effects of mortality salience. Certainly, we are not arguing that death is a pleasant thought or that it could not be perceived as a threat requiring defensive responses. Rather, our results support the notion that the meaning of death may be more complex (and much simpler) than previous theoretical approaches have acknowledged. From a purely informational perspective, death may serve as a reminder that life is finite. This finiteness may lead to more positive evaluations of the commodity that is human existence. Furthermore, enhancing life’s value promotes the cognitive accessibility of death (i.e., life’s scarcity). The results of Studies 2 and 3 do not seem to be easily explained by previous conceptualizations of death, but they are explained by the strong, bidirectional association of value with scarcity.

Certainly, the operations of this cognitive association may coexist with more distal defensive processes. The defensive processes described by TMT occur after delay, when mortality has moved from focal awareness. This delay seems to be crucial to differentiating responses that are due to cognitive processes and those that are motivational in nature. These distal defensive processes represent the “meat” of TMT, and the present results do not speak to these. However, our results do suggest that immediate reactions to mortality salience are not necessarily defensive, but rather follow from the association between scarcity and value. Future research might examine the extent to which the operations of the scarcity heuristic (in enhancing life’s value) may influence subsequent efforts to buffer the threatening aspects of death. Furthermore, death may render a variety of variables associated with being alive (e.g., the self, worldviews) more valuable. Research might examine whether death re-

mindings affect evaluations of these varied aspects of life in a way predicted by the scarcity heuristic.

These results suggest that rather than being intricately connected with meaninglessness, the reality of death may promote a sense of meaning in life. Further, when life is highly valuable, death is not pushed out of awareness, but is rendered more accessible because of the link between value and scarcity. Perhaps ironically, enhancing the value of life promotes thoughts of death. Such an association might have implications for policies aimed at promoting a “culture of life.” Reminding individuals of the reality of death may be more effective for promoting the value of life than directly reminding them of the value of life.

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