

Accepted Version

Death Thoughts Predict Increased Depression for Those with Low Self-Worth

Samuel Fairlamb

Psychology Department, Royal Holloway, University of London

Jacob Juhl

School of Psychology, University of Southampton

Author Contribution:

S. Fairlamb developed conceived and designed the study. S. Fairlamb collected and analyzed the data. J. Juhl and S. Fairlamb drafted the manuscript, and both approved the final version of the manuscript for submission.

Corresponding author: Samuel Fairlamb, Department of Psychology, Royal Holloway, University of London. Egham Hill, Egham, TW20 0EX. Email: Samuel.fairlamb@rhul.ac.uk

Abstract

Terror management theory specifies that a sense of self-worth is necessary to prevent the awareness of death from undermining psychological well-being. We tested the theory's claims about well-being within the context of depression, by measuring self-worth, death-thought accessibility, and depression in an online study ($N = 365$). Consistent with the theory, death-thought accessibility predicted increased depression, but only among those with low, not high, self-worth. Our findings support existential clinical theorists' claims for psychological therapies to appreciate the underlying reasons for the need for self-worth.

Keywords: terror management, death-thought accessibility, depression, well-being, self-worth

Terror management theory (TMT; Pyszczynski et al., 2015) is a prominent social psychological theory that illuminates the various ways in which different individuals, from different cultures, go about managing concerns of death. TMT states that humans' awareness of death, alongside the evolutionary-predisposed desire to survive, poses a powerful psychological threat. However, it further stipulates that people are able to manage such threatening thoughts about death by maintaining faith in cultural worldviews and attaining self-worth by living up to the standards prescribed by their worldviews. Cultural worldviews are beliefs about the nature of reality, and are largely informed by the culture and subcultures to which individuals subscribe. Importantly, cultural worldviews provide attitudinal and behavioral standards. Those who perceive that they are living up to these standards are able to possess a sense of self-worth (i.e., value, meaning, significance) that transcends that of their mortal, physical self, thus managing concerns about death and allowing individuals to go about their lives with relative psychological equanimity.

One line of evidence for TMT has tested the death-thought accessibility (DTA) hypothesis (Hayes et al., 2010). This hypothesis states that, if certain structures (i.e., worldviews, self-worth) help keep individuals from being preoccupied with death thoughts, then threatening these structures should heighten the accessibility of death-related thoughts. The most common method of measuring DTA, which has been utilized in over a hundred studies (Steinman & Updegraff, 2015), is a word-stem completion task, whereby some word-stems can be completed with a death-related or neutral-related manner (e.g., KI __ E D can be *killed* or *kissed*). Supporting the hypothesis, Schimel et al. (2007) found in several studies that threatening participants' worldviews (e.g., having Canadians read a website that derogated Canadian values) increases DTA. In another series of studies, Hayes et al. (2008) found that threatening one's self-worth (e.g., providing participants with negative feedback on an intelligence test) increases DTA.

Another main line of evidence stems from the mortality salience (MS) hypothesis (Pyszczynski et al., 2015). According to the MS hypothesis, if certain structures (i.e., cultural worldviews, self-worth) help manage concerns about death, then experimentally heightening the awareness of death (i.e., making mortality salient) should increase investment in these structures. In line with this, studies have shown that MS inductions increase affinity for those who share cultural beliefs and decrease affinity for those who do not; increase aggression towards those who threaten cultural worldviews; reduce the likelihood of using sacred cultural icons irreverently (e.g., American flag, crucifix); increase culturally-valued helping behaviour; and increase efforts to live up to culturally prescribed standards of self-worth (for reviews see Greenberg, Solomon, & Arndt, 2008; Pyszczynski et al., 2015; Vail et al., 2012).

In all, TMT research has shown that the awareness of death underlies several social phenomena (e.g., prejudice, intergroup conflict, prosocial behavior, aggression, see Vail et al., 2012 for full review). However, the theory does not just provide an account of social behavior; it is also a theory about psychological health and well-being (Juhl, 2019). It outlines the conditions that are necessary for well-being and explains why those conditions are necessary. More specifically, it states that people need to maintain a sense of self-worth in order to prevent the awareness of death from compromising well-being.

Recent work has examined whether the awareness of death bears negative consequences on well-being among those who lack self-worth (for reviews, see Juhl, 2019; Juhl & Routledge, 2016). For example, across several studies, Routledge et al. (2010) measured self-worth, experimentally heightened the awareness of death (i.e., MS vs. control), and then measured various aspects of well-being (e.g., anxiety, vitality, satisfaction with life). Consistent with TMT, heightening death awareness increased anxiety and decreased satisfaction with life and vitality, but only for those with low, not high, self-worth.

This line of work provides key evidence for the theory's assertions about

psychological health. However, it has largely focused on the effects of death awareness on anxiety (e.g., Abeyta, Juhl, & Routledge, 2014; Juhl & Routledge, 2014). Little empirical attention has been given to an important mental health condition: depression. However, theorists have claimed that the awareness of death provides grounds for feelings of hopelessness and depression (Becker, 1973; Yalom, 2008). The prospect that life is ultimately going to end, despite one's best efforts to live a healthy life, can be extremely demotivating (Hayes, Ward, & McGregor, 2016). Moreover, humans' awareness of the fact that death could happen at any time for unpredictable reasons highlights the potential meaninglessness of life and efforts to survive. According to TMT, however, possessing a sense of self-worth that transcends one's physical existence protects against depression.

One prior study has examined the role of death awareness in depression (Hayes et al., 2016; Study 5). This study found that MS (vs. control) marginally increased depression, but only for those with low "self-satisfaction" (a composite of life satisfaction and self-worth) who had also reflected on a personal failure. Although this study has merit, it has a limited capacity to test our current hypothesis that depression may be a manifestation of when people lack the necessary conditions (i.e., self-worth) to protect from the awareness of death. First, the study was intended to examine a different hypothesis, which regarded death awareness, goal frustration, and the desire for life, and it contained an experimental manipulation (reflection of goal failure vs. goal success) that was outside the purview of our current hypothesis. Second, the study used a measure of state depression (Spielberger et al., 2003), which measures depressed mood. Although this was ideal for the purpose of that study, it does not capture depression as a more stable mental health condition, which was our focus.

One barrier to examining depression as an outcome of death awareness is that, as a more stable condition, it is unlikely to be affected by brief experimental inductions (Cruwys, South, Greenaway, & Haslam, 2015), such as temporally heightening the awareness of death.

One way to circumvent this issue is to measure individual differences in the accessibility of death thoughts (Hayes et al., 2010), rather than temporally inducing death thoughts. Although DTA was initially measured as an outcome of threats to worldviews and self-worth (Hayes et al., 2008; Schimel et al., 2007), research has also measured it as an individual difference and shown that it relates to other constructs in theoretically consistent ways (e.g., Taubman-Ben-Ari & Noy, 2010; Vess, Routledge, Landau, & Arndt, 2009).

Thus, in the present study, we measured self-worth, DTA, and depression. We hypothesized that DTA would predict increased depression, but only for those with low, not high, self-worth.

Method

Participants

In all, 407 participants initiated the study, but we removed 36 who did not complete it, 5 who took longer than 10 minutes to complete the DTA task, and 1 whose responses indicated that they did not take the task seriously. This left a final sample of 365 participants ($M_{age} = 25.3$, $SD_{age} = 6.8$, age range = 16-55, 183 females, 175 males, 6 transsexual or intersex, 1 unknown).

Procedure

We obtained ethical approval from the university. We recruited participants from various online forums (studentroom, reddit) as well as social media, and participation was voluntary. We collected data from February-August, 2019. All participants completed the study anonymously, and completed the materials in the following order.

Materials

The Rosenberg Self-Esteem Scale (Rosenberg, 1965) includes 10 statements measuring one's perception of their own self-worth on a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*) (e.g., *I feel that I'm a person of worth, at least on an equal*

basis with others). Rosenberg (1965) reported that the scale had high reliability ($\alpha = .92$). We also obtained high reliability ($\alpha = .92$), and thus, after reverse scoring appropriate items, we averaged them to compute self-worth scores. Higher scores reflect higher self-worth.

The Depression, Anxiety and Stress Scales - 21 (DASS-21) (Lovibond & Lovibond, 1995) is a well-validated scale that measures depression, anxiety and stress, each in 7 items. Our interest was on the depression subscale, for which participants indicated how frequently (0 = *almost never*, 4 = *almost all the time*) they experienced seven symptoms over the past week (e.g., *I felt that I had nothing to look forward to*). Lovibond and Lovibond (1995) reported that the scale had high reliability ($\alpha = .91$). We also obtained high reliability ($\alpha = .91$) and thus averaged them to compute depression scores. Higher scores indicate greater depression. Although our main focus was on depression, we present results for anxiety and stress in the Supplementary Materials.

We measured DTA using a well-validated word-stem completion task (Schimmel et al., 2007; Steinman & Updegraff, 2015). We presented participants with 20-word fragments and instructed them to fill in the blanks to form a word using the first word that came to mind. Six of the fragments could be completed with a death-related word or a word that is not related to death (e.g., SK _ _ L could be *skill* or *skull*). The possible death related words were buried, dead, killed, grave, skull, and coffin. We summed the number of death-related words that participants used to complete these fragments to compute DTA scores.

Results

Table 1 presents the descriptive statistics for all measured variables. Overall, participants exhibited varying levels of DTA, with the mean score (2.06) being consistent with prior research that has measured DTA as an individual difference (e.g., Vess et al., 2009). Self-worth levels were just above the mid-point of the scale and similar to those reported in previous research (Phillips & Hine, 2016; Routledge et al., 2010). Depression

levels were mild (Lovibond & Lovibond, 1995) and but slightly higher than reported in previous research (Woodward McIlwain, & Mond, 2019).

To test the hypothesis that DTA would be associated with increased depression, but only for those with low, not high, self-worth, we conducted a moderation analysis using model 1 of PROCESS (v.3.4, Hayes, 2018). We entered DTA as the independent variable, self-worth as the moderator, and depression as the dependent variable.

The self-worth X DTA interaction was significant, $\beta = -.04$, $SE = .02$, $t(361) = 2.29$, $p = .023$, 95% CI [-.08, -.01] (see Figure 1). To probe this interaction, we examined the relationship of DTA with depression at high (+1 *SD*) and low (-1 *SD*) levels of self-worth. At low levels of self-worth, DTA predicted increased depression, $\beta = .12$, $SE = .03$, $t(361) = 3.58$, $p < .001$, 95% CI [.05, .18]. However, this effect was not found at high levels of self-worth, $\beta = .01$, $SE = .04$, $t(361) = .31$, $p = .758$, 95% CI [-.06, .08]. We also examined the relationship between self-worth and depression at high and low levels of DTA by re-running the analysis entering self-worth as the independent variable and DTA as the moderator. At both high, $\beta = -.46$, $SE = .03$, $t(361) = 16.26$, $p < .001$, 95% CI [-.51, -.40], and low, $\beta = -.37$, $SE = .03$, $t(361) = 12.04$, $p < .001$, 95% CI [-.42, -.31], levels of DTA, self-worth predicted reduced depression. However, this relationship was significantly stronger at high levels of DTA than at low levels of DTA, and these slopes were significantly different from each other, $t(361) = 2.29$, $p = .023$, 95% CI [-.15, -.01].

As shown in Table 1, gender and age evince relations with our primary variables. Re-running the above analysis controlling for age and gender did not alter the findings.

Discussion

Our findings improve the understanding of the conditions necessary for maintaining sound mental health and support a TMT perspective on why those conditions are necessary. Specifically, they highlight the importance of self-worth for preventing depression and

suggest that an underlying reason why self-worth is important is because it helps prevent the awareness of death from resulting in depression.

Unlike previous research, we measured, rather than manipulated, individual differences in death thoughts. This creates a limitation, hindering the capacity to make strong causal inferences about the effect of death thoughts on depressive symptomology. This limitation, however, is inherent to the hypothesis we aimed to examine; as noted, temporary manipulations are not likely to alter symptoms of a more stable condition, such as depression (Cruwys et al., 2015). Future research could manipulate death thoughts and measure state depression (or depressive mood) in order to ascertain the causal effect of death thoughts. However, measuring depressive mood would not afford the capacity to draw conclusions about depression as a more stable condition, which was the focus of our current investigation. Measuring individual differences in death thoughts thus afforded the opportunity to test our hypothesis. When experimental manipulations prove difficult or problematic, this approach may be a useful avenue for further exploring TMT. Moreover, measuring naturally occurring individual differences in death thoughts, rather than artificially inducing death thoughts, lends some degree of ecological validity to our findings.

Our findings are consistent with the view espoused by TMT and existential theorists' that humans' awareness of death underlie mental health problems. Specifically, they support the notion that death cognitions may manifest in hopelessness, futility, and despair when people lack the necessary buffers (i.e. self-worth) to manage these thoughts. In a similar vein, our study lends support to existential clinical theorists' (e.g., Yalom, 2008) call for therapies to appreciate the deeper reasons (e.g., death awareness) why self-worth is important and the underlying psychological structures upon which individual's self-worth is based. Regarding the latter, TMT states that self-worth is rooted in perceptions that one is living up to the standards provided by their worldview (i.e., beliefs about the nature of reality). Thus, it is

important to take stock of the integrity of an individual's contingencies of self-worth and the beliefs system upon which they are based (see also Janoff-Bulman, 1992).

If one's belief system proposes rigid, or unrealistic, standards of self-worth, then this could be a recipe for psychological despair. Similarly, extrinsic contingencies of self-worth require external validation in order for individuals to attain perceptions of worth, which might make them ultimately unstable sources of self-worth. Intrinsic contingencies, however, do not rely on external validation. Indeed, intrinsic contingencies are positively associated with well-being, while negative extrinsic contingencies are negatively associated with well-being (Vonk & Smith, 2012). Research suggests that Yalom's (2008) appeal for therapy to uncover the core source of existential concern (i.e., death) may help individuals shift from extrinsic to intrinsic contingencies. For example, conscious contemplation of death leads individuals to trivialize extrinsic goals (Kosloff & Greenberg, 2009). Willingness to confront one's own mortality in therapeutic settings could thus be an effective means to build a more stable set of contingencies for self-worth upon which mortality-related concerns can be managed.

Our research is not without limitations. As mentioned, we are unable to make causal claims regarding the role of death thoughts. Additionally, other factors not measured in the present study, such as education level, may have influenced participant's capacity to complete word-stems, thus influencing their responses on the task. Future research measuring DTA using a word-stem task should also assess education level to account for this. Finally, participants completed the study online with their own devices in an uncontrolled environment. This introduced the possibility that distractions and extraneous factors could influence death thoughts or interfere with the assessment of self-worth or depression. Follow-up research should seek to collect data in a controlled laboratory.

In sum, the present study adds to a growing area regarding the role of death awareness on well-being by examining the case of depression. The findings suggest that depression may

be characterized by heightened death thoughts, amongst those who lack self-worth.

References

- Abeyta, A. A., Juhl, J., & Routledge, C. (2014). Exploring the effects of self-esteem and mortality salience on proximal and distally measured death anxiety: A further test of the dual process model of terror management. *Motivation and Emotion*, 38(4), 523-528. DOI: 10.1007/s11031-014-9400-y
- Becker, E. (1973). *The Denial of Death*. New York: Free Press.
- Cruwys, T., South, E. I., Greenaway, K. H., & Haslam, S. A. (2015). Social identity reduces depression by fostering positive attributions. *Social Psychological and Personality Science*, 6(1), 65-74. DOI: 10.1177/1948550614543309
- Greenberg, J., Solomon, S., & Arndt, J. (2008). A basic but uniquely human motivation: Terror management. In J. Y. Shah, W. L. Gardner (Eds.). *Handbook of motivation science* (pp. 114-134). New York: Guilford Press.
- Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Publications.
- Hayes, J., Schimel, J., Arndt, J., & Faucher, E. H. (2010). A theoretical and empirical review of the death-thought accessibility concept in terror management research. *Psychological bulletin*, 136(5), 699-739. DOI: <https://psycnet.apa.org/doi/10.1037/a0020524>
- Hayes, J., Schimel, J., Faucher, E. H., & Williams, T. J. (2008). Evidence for the DTA hypothesis II: Threatening self-esteem increases death-thought accessibility. *Journal of Experimental Social Psychology*, 44(3), 600-613. DOI: <https://doi.org/10.1016/j.jesp.2008.01.004>
- Hayes, J., Ward, C. L., & McGregor, I. (2016). Why bother? Death, failure, and fatalistic withdrawal from life. *Journal of Personality and Social Psychology*, 110(1), 96-115.

DOI: 10.1037/pspp0000039

Janoff-Bulman, (1992). *Shattered Assumptions*. New York: Free Press.

Juhl, J. (2019). Terror Management Theory: A Theory of Psychological Well-Being. In C. Routledge & M. Vess (Eds.), *Handbook of Terror Management Theory* (pp. 303-324). Academic Press.

Juhl, J., & Routledge, C. (2014). The effects of trait self-esteem and death cognitions on worldview defense and search for meaning. *Death studies*, 38(1), 62-68. DOI: <https://doi.org/10.1080/07481187.2012.718038>

Juhl, J., & Routledge, C. (2016). Putting the terror in terror management theory: Evidence that the awareness of death does cause anxiety and undermine psychological well-being. *Current Directions in Psychological Science*, 25(2), 99-103. DOI: 10.1177/0963721415625218

Kosloff, S., & Greenberg, J. (2009). Pearls in the desert: Death reminders provoke immediate derogation of extrinsic goals, but delayed inflation. *Journal of Experimental Social Psychology*, 45(1), 197-203. DOI: <https://doi.org/10.1016/j.jesp.2008.08.022>

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour research and therapy*, 33(3), 335-343. DOI: 10.1016/0005-7967(94)00075-U

Phillips, W. J., & Hine, D. W. (2016). En route to depression: Self-esteem discrepancies and habitual rumination. *Journal of personality*, 84(1), 79-90. DOI: <https://doi.org/10.1111/jopy.12141>

Pyszczynski, T., Solomon, S., & Greenberg, J. (2015). Thirty years of terror management theory: From genesis to revelation. *Advances in experimental social psychology*, 52, 1-70. DOI: <https://doi.org/10.1016/bs.aesp.2015.03.001>

- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Routledge, C., Ostafin, B., Juhl, J., Sedikides, C., Cathey, C., & Liao, J. (2010). Adjusting to death: The effects of mortality salience and self-esteem on psychological well-being, growth motivation, and maladaptive behavior. *Journal of Personality and Social Psychology, 99*, 897-916. DOI: <https://doi.org/10.1037/a0021431>
- Schimmel, J., Hayes, J., Williams, T., & Jahrig, J. (2007). Is death really the worm at the core? Converging evidence that worldview threat increases death-thought accessibility. *Journal of personality and social psychology, 92*(5), 789-803. DOI: <https://psycnet.apa.org/doi/10.1037/0022-3514.92.5.789>
- Spielberger, C. D., Ritterband, L. M., Reheiser, E. C., & Brunner, T. M. (2003). The nature and measurement of depression. *International Journal of Clinical and Health Psychology, 3*, 209–234.
- Steinman, C. T., & Updegraff, J. A. (2015). Delay and death-thought accessibility: A meta-analysis. *Personality and Social Psychology Bulletin, 41*(12), 1682-1696. DOI: <https://doi.org/10.1177%2F0146167215607843>
- Taubman–Ben-Ari, O., & Noy, A. (2010). Self-consciousness and death cognitions from a terror management perspective. *Death studies, 34*(10), 871-892. DOI: <https://doi.org/10.1080/07481187.2010.496685>
- Vail III, K. E., Juhl, J., Arndt, J., Vess, M., Routledge, C., & Rutjens, B. T. (2012). When death is good for life: Considering the positive trajectories of terror management. *Personality and Social Psychology Review, 16*(4), 303-329. DOI: 10.1177/1088868312440046
- Vess, M., Routledge, C., Landau, M. J., & Arndt, J. (2009). The dynamics of death and meaning: The effects of death-relevant cognitions and personal need for structure on

perceptions of meaning in life. *Journal of Personality and Social Psychology*, 97(4), 728–744. DOI: <https://doi.org/10.1037/a0016417>

Vonk, R., & Smit, H. (2012). Optimal self-esteem is contingent: Intrinsic versus extrinsic and upward versus downward contingencies. *European Journal of Personality*, 26(3), 182-193. DOI: <https://doi.org/10.1002/per.817>

Woodward, K., McIlwain, D., & Mond, J. (2019). Feelings about the self and body in eating disturbances: The role of internalized shame, self-esteem, externalized self-perceptions, and body shame. *Self and Identity*, 18(2), 159-182. DOI: <https://doi.org/10.1080/15298868.2017.1403373>

Yalom, I. D. (2008). *Staring at the sun: Overcoming the terror of death*. San Francisco, CA: Jossey-Bass.

Table 1.

Means, standard deviations and correlations between the measured variables

	1.	2.	3.	4.	5.
1. Self-worth	-	-.73***	-.29***	.22**	-.18**
2. Depression		-	.30***	-.17**	.16**
3. DTA			-	-.11*	.03
4. Age				-	-.04
5. Gender					-
Mean	4.19	2.11	2.06	25.31	-
SD	1.32	0.78	1.11	6.77	-

Note. * $p < .05$; ** $p < .01$; *** $p < .001$. $N = 365$; $df = 363$. Correlations concerning gender (male = 0 Male; Female = 1) are point biserial and excluding non-binary responses ($N = 358$; $df = 356$).

Figure

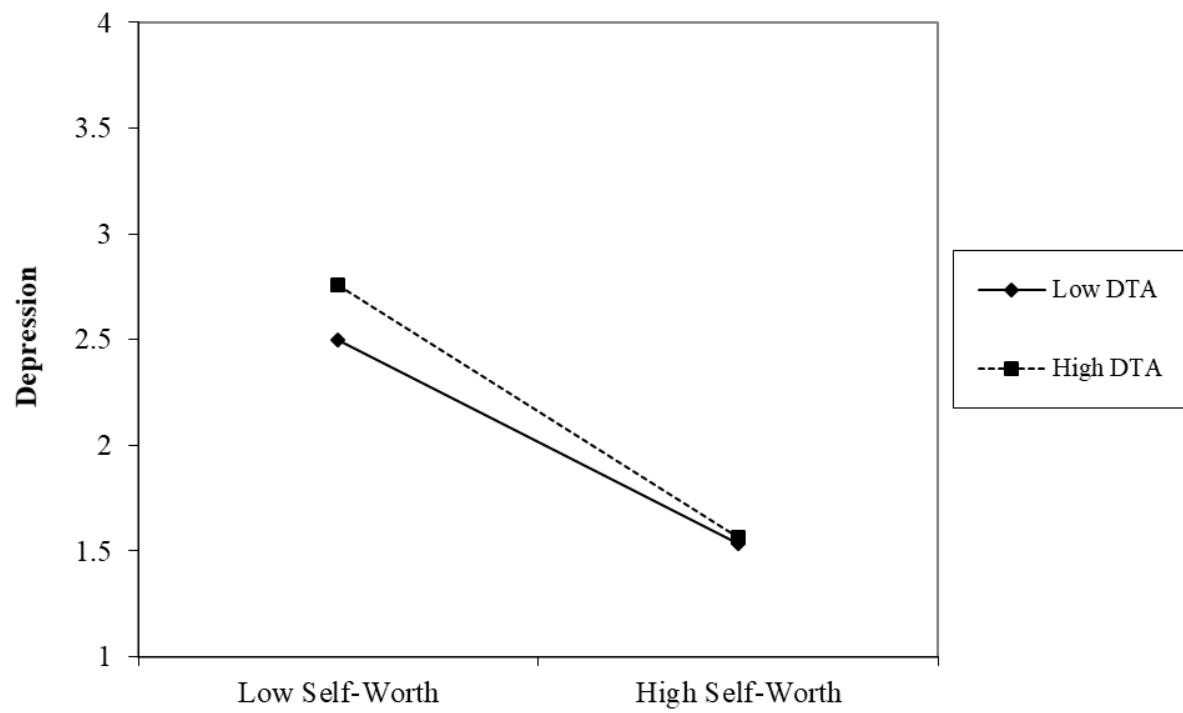


Figure 1: Interaction between self-worth and DTA on depression plotted at low ($-1 SD$) and high ($+1 SD$) of self-worth and DTA.