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On the Meaningfulness of Existence: When Life Salience Boosts Adherence to Worldviews
European Journal of Social Psychology
2011, 41 (6), pp. 740-750
which has been published in final form at
<http://dx.doi.org/10.1002/ejsp.819>**

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On the Meaningfulness of Existence:
When Life Salience Boosts Adherence to Worldviews

Wijnand A. P. van Tilburg & Eric R. Igou

University of Limerick, Republic of Ireland and Tilburg University, the Netherlands

Author Note

Wijnand A. P. van Tilburg, Department of Psychology, University of Limerick, Castletroy, Republic of Ireland; Eric R. Igou, Department of Psychology, University of Limerick, Castletroy, Republic of Ireland.

This research was in part funded by a PhD scholarship grant from the Irish Research Council for the Social Sciences and Humanities (IRCHSS). We wish to thank Kasper ter Stege for his data collection. Correspondence concerning this article should be addressed to Wijnand A. P. van Tilburg, Department of Psychology, Computer Science Building, University of Limerick; Castletroy, Republic of Ireland, Phone: +35361234692, Email: Wijnand.vanTilburg@ul.ie

Abstract

We investigated when and how life salience boosts adherence to worldviews. It was hypothesized that, similar to thoughts of mortality, thoughts about a meaningful existence increase adherence to worldviews. Study 1a, 1b, and 1c yielded support for the symmetric effects of life and mortality salience on existential thoughts and worldview adherence. Furthermore, Study 2 showed that contemplating life's meaningfulness (vs. meaninglessness) increased adherence to worldviews. Study 3 showed increased worldview adherence when contemplating life's meaningfulness (vs. meaninglessness), and provided additional evidence that the effect on worldview adherence was mediated by the appraisals of life's meaningfulness. Finally, Study 4 suggests that both reflecting on life and mortality leads to more worldview adherence under conditions of meaningful life appraisals. The findings are discussed with respect to research in existential psychology.

Keywords: Life salience, mortality salience, existential psychology, meaning

On the Meaningfulness of Existence:

When Life Salience Boosts Adherence to Worldviews

Research has identified that existential concerns affect inner psychological conflicts, judgments, and behavior. Existential concerns can relate to the question of death, as the end of existence, and they can relate to the value or meaningfulness of life (for overviews see Greenberg, Koole, & Pyszczynski, 2004; Heine, Proulx, & Vohs, 2006; Van den Bos, 2004). Much research has been published on the effects of mortality salience on worldview defense (e.g., Greenberg et al., 2004); in contrast, we are interested in the effects of *life salience* on adherence to worldviews. Based on research regarding the relationship between life and death thoughts (King, Hicks, & Abdelkhalik, 2009; Silvia, 2001), the goal of the present research was to identify the consequences of contemplating life's meaningfulness. Importantly, we pose that not only thoughts about death but also thoughts about life can lead to greater worldviews adherence. We argue that contemplating one's life may have similar effects as contemplating one's death, insofar as both involve appraising life's meaningfulness. We essentially suggest that reflecting on life reminds people of life's meaningfulness and hence increases the value and adherence to the specific worldviews that give life its meaning.

The Source of Existential Thoughts and Worldviews

Like other animals, human beings feed, sleep, and mate. Unlike other animals, humans conduct science, engage in religion, and spend hours discussing whether or not a free will exists. What do these seemingly different activities have in common? One interesting aspect is that each of them illustrates that humans attempt to perceive the world, and themselves, in a meaningful fashion (e.g., Pyszczynski, Greenberg, Koole, 2004). That is, people wish to perceive the world as coherent and understandable; a world that makes sense (i.e. meaningful) is a world that follows our expectations of how elements in the world should or should not be related to each other (Heine et al., 2006).

The desire for meaning can be understood as our response to the ability to think, reflect, and be aware of ourselves. As Fromm (e.g., 1947, 1955) argued, besides offering us freedom, our ability to reason and be aware of ourselves comes with the recognition of our powerlessness and limited existence: Reason is not only a blessing, but also a curse. We cannot fully escape this recognition and we are forced to seek and reaffirm the meaningfulness of our existence by creating and using ideologies (worldviews). Becker (e.g., 1973) identified and integrated the conceptualizations of various social scientists and philosophers on how thinking and behavior result from the terrifying thoughts of one's inevitable death (greatly based on Rank, 1941/1958; 1978a; 1978b). His crucial psychological assumptions were recognized by social psychologists and integrated into terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986; Greenberg, Koole & Pyszczynski, 2004).

TMT points to the conflict between our biological drive to survive and the awareness that immortality is impossible. TMT asserts that the conflict between inevitable death and the drive for self-preservation leads to an existential anxiety that can be resolved by the creation and pursuit of meaning. Worldviews such as religion, cultural values, or group ideologies provide individuals with a feeling of literal or symbolic immortality, and the enduring value associated with these views gives life its perceived meaningfulness (e.g., Greenberg et al., 2004). Worldviews provide people with a framework to interpret the world they live in; worldviews guide people's understanding of the world by offering structures that make life meaningful and individuals adhere to these worldview beliefs which in turn imbue the world with meaning (Greenberg et al., 2004). In other words, appraisals of life's meaningfulness are embedded in the specific worldviews that people embrace (see Figure 1).

Mortality and Life Salience

In recent years, the mortality salience hypothesis, which stems from TMT, has been widely studied. Briefly put, this hypothesis states that reminders of mortality (i.e., mortality salience) increases adherence to worldviews by for example embracing cultural values such as materialism (Kasser & Sheldon, 2000), derogating those who are perceived to challenge the dominant cultural worldview (Greenberg, Pyszczynski, & Solomon, 1997), embracing conservative cultural ideologies, or supporting a cultural leader (Landau Solomon, Greenberg, et al., 2004).

As it is the *relation* between life and death that represents an existential threat (i.e., the recognition that death ends existence), there has been a recent increase in attention given to the role of life (as death's logical counterpart). Based on the notion that life and death are so closely linked, it has been proposed that inducing *self-awareness* may lead to thoughts of both life and death, as it is the human awareness of their own *existing self* which creates the potential to experience existential threats (e.g., Arndt, Cook, & Routledge, 2004; Arndt, Greenberg, Simon, Pyszczynski, & Solomon, 1998; Silvia, 2001). For example, Silvia (2001) made the important observation that self-awareness resulted not only in more life-thoughts, but also death thoughts became more accessible. As Silvia expressed it, awareness of one's "being" includes the reflection on "non-being:" Life and death are opposites, but they are also two sides of the same coin, and reflecting upon one implies reflecting upon the other.

In very recent research, King, Hicks, and Abdelkhalik (2009) suggest a novel interpretation of mortality salience effects. Based on research on the value heuristic (Dai, Wertenbroch, & Brendl, 2006), King and colleagues argue that being reminded of death makes life seem more meaningful because people realize life's fragile and finite nature. Specifically, based on the notion that the value attributed to a commodity increases with its scarcity (Kahneman & Fredrick, 2002), King and colleagues suggest that that death

(representing life's scarcity) paradoxically *affirms* life meaningfulness (as a form of value). Indeed, participants who were primed with death related words considered life to be *more* meaningful compared to participants primed with pain related words. Moreover, King and colleagues showed that participants who wrote about why life was meaningful had increased death-thought accessibility relative to conditions in which participants did not contemplate life's meaningfulness or wrote about why life was not meaningful. In sum, King and colleagues found strong evidence of the bidirectional relationship between thought of life and death as earlier suggested by Silvia (2001), and added that death contemplations makes life seem more meaningful.

In essence, these recent findings suggest similar effects of life and death thoughts, and furthermore indicate that death thoughts are associated with appraising life as meaningful. As a next step, we investigated in more detail what effects thoughts of life and death have on appraising life's meaningfulness and adherence to worldviews.

Life Salience and Worldview Adherence

Our focus is on whether and under which conditions life or death thoughts boost the value attached to worldviews. We argue that worldview adherence results from such meaning-appraisals (people's interpretation of the meaningfulness of life). Heine and colleagues' (2006) meaning maintenance model suggests that people maintain or re-establish their overall sense of meaning by a variety of meaning sources such as cultural or personal worldviews. We propose that reflecting about the overall, superordinate meaningfulness of one's existence affects the subordinate components of the meaning system (e.g., worldviews; see Figure 1). If life is appraised as meaningful, then personal and cultural worldviews are likely to be actualized and strengthened, leading to a boost in adherence to worldviews. Consequently, we argue that life and death thoughts have symmetrical effects on worldview

adherence, similar to the symmetrical effects that thus far have been reported for thought accessibility (King et al., 2009; Silvia, 2001).

Note, however, that we propose boundary conditions for the effects on worldview adherence. Consistent with our claim that the value attached to worldviews reflects the appraisal that life in general is *meaningful*, we argue that worldview adherence is reduced when life is appraised as generally meaningless. In essence, our reasoning is straightforward yet very novel: because existential reflections of life remind people of life's meaningfulness, they will increase adherence to the specific worldviews that give life its meaning – in the same way as it has been shown to happen as a result of reflections on death.

Study 1a

Three studies were designed to examine the relationship between thoughts of life and death, meaningfulness, and adherence to worldviews. First, we tested in Study 1a the crucial hypothesis that life salience and mortality salience similarly increase appraisals of life's meaningfulness relative to a control condition. In addition, we addressed an alternative hypothesis. Past research indicates that mortality salience can elicit creatureliness thoughts (i.e. concerns about human-animal similarities; e.g., Goldenberg, Pyszczynski, Greenberg, Solomon, Kluck, & Cornwell, 2001). Given that our approach is *not* based on the idea that such thoughts about human-animal similarities are responsible for symmetrical effects of life and mortality salience on adherence to worldviews, we tested whether life salience increases creatureliness thoughts.

Method

Participants and design. Sixty undergraduate students (44 females; $M_{\text{age}} = 19$, $SD = 15$) from the University of Limerick participated in a paper-and-pencil study in exchange for course credit. Participants were randomly assigned to the Mortality Salience, Life Salience, or Control condition.

Materials and procedure. After giving informed consent, participants answered two essay questions designed to elicit existential thoughts of life or death, whereas participants in the control condition were asked to write about watching television. For Mortality Saliency we adopted two widely used tasks: “Please briefly describe the emotions that the thought of your own death arouses in you,” and “Jot down, as specifically as you can, what you think will happen to you physically as you die and once you are physically dead” (e.g., Greenberg et al., 2004). For the Existential Life Saliency condition, these tasks were slightly altered and read: “Please briefly describe the emotions you feel when ‘living life to the fullest,’” and “Jot down a situation in which you physically experience your life intensely.” In the Control condition the essay questions read: “Please, briefly describe the emotions that you experience when you watch television,” and “Jot down, as specifically as you can how important it is for you to watch television” (e.g., Kasser & Sheldon, 2000). Next, we measured the extent to which the essay questions made participants contemplate life’s meaningfulness with the items “To what extent do these questions make you think about life’s meaningfulness?” and “To what extent do these questions make you think about the value of life?” that had to be rated on a seven-point scale from 1 (*not at all*) to 7 (*very much*). In addition, we included two items that measured the extent to which the essay questions made participants reflect on similarities between animals and humans. Specifically, participants rated their agreement with the items “To what extent do these questions make you consider whether humans and other animals are the same?” and “To what extent do these questions make you reflect on the similarities between humans and other animals?” on seven-point scales from 1 (*not at all*) to 7 (*very much*). Afterwards, participants were thanked and debriefed.

Results

A one-way ANOVA with the manipulation (Mortality Saliency, Life Saliency, and Control) as independent variable and with the composite score of meaningfulness appraisals

($r = .81, p < .001$) as dependent variable revealed significant differences between conditions, $F(2, 57) = 9.95, p < .001, \eta^2 = .26$. Contrast analysis revealed that participants reflected to a greater extent on life's meaningfulness in the Life Salience condition ($M = 4.75, SD = 1.33$) compared to the Control condition ($M = 2.13, SD = 1.85$), $F(1, 37) = 12.36, p < .001, \eta^2 = .25$; response in the Mortality Salience condition ($M = 5.26, SD = 1.69$) also differed from the Control condition, $F(1, 39) = 14.98, p < .001, \eta^2 = .28$. Consistent with our hypothesis, there was no difference between the Life Salience and Mortality Salience conditions in appraising life's meaningfulness ($F < 1$).

A one-way ANOVA with the manipulation (Mortality Salience, Life Salience, and Control) as independent variable and with the composite score of creatureliness thoughts ($r = .81, p < .001$) as dependent variable revealed significant differences between conditions, $F(2, 57) = 7.70, p < .001, \eta^2 = .21$. Consistent with past research (e.g., Goldenberg et al., 2001), participants thought more about human-animal similarities in the Mortality Salience condition ($M = 4.07, SD = 1.91$) compared to the Control condition ($M = 2.16, SD = 1.12$), $F(1, 39) = 15.67, p < .001, \eta^2 = .29$. More importantly, however, we observed more of these thoughts in the Mortality than in the Life Salience condition ($M = 2.71, SD = 1.75$), $F(1, 38) = 5.49, p = .03, \eta^2 = .17$; and there was no significant difference between the Life Salience and Control conditions, $F(1, 37) = 1.56, p = .22, \eta^2 = .04$. Hence, these results suggest that *both* mortality and life salience increased meaningfulness appraisals but *only* mortality salience triggers creatureliness thoughts.

Study 1b

After establishing that life and mortality salience elicited existential thoughts, we tested the hypothesis that both life and mortality salience increased worldview adherence in the context of Dutch society. In Study 1b, we investigated this hypothesis by comparing participants' attitudes to the right of immigrants to maintain their cultural lifestyle in the

Netherlands. Greenberg and colleagues (1997) found that mortality salience increases the derogation of an out-group and suggested that this resulted from the potential threat that the out-group imposed to the dominant cultural worldview. Similarly, we suggested that when Dutch participants engage in existential contemplations of life or of death, they would derogate immigrants to a greater extent as a result of their greater adherence to the dominant cultural worldview. Immigrants were specifically selected as target out-group as immigration and integration issues received increasing media attention in the Netherlands at the time of the research; the integration of immigrants had become one of the major issues in (inter)national and regional Dutch politics as many citizens seemed to worry that immigrants challenged the dominant Dutch culture. We predicted increased cultural worldview adherence under *both* mortality salience and life salience compared to a control condition.

Method

Participants and design. Eighty-four visitors of a Dutch public library were willing to participate in a short paper-and-pencil study in exchange for a candy-bar. Four participants were excluded from the analysis as they failed to follow instructions (skipping measures). The remaining sample consisted of 80 participants (41 females; $M_{\text{age}} = 31$, $SD = 15$), who were randomly assigned to a Mortality Salience, Life Salience, or Control condition.

Materials and procedure. After giving informed consent, participants answered the two essay questions used in Study 1a according to their assigned condition. Effects of mortality salience on worldview adherence are commonly studied after a short delay (e.g., Arndt et al., 2004) and the manipulation was therefore followed by an unrelated filler task (a word puzzle) before worldview adherence was assessed.

After the filler task, participants read a brief passage about a code of conduct for immigrants recently adopted by the Rotterdam city council. The passage then stated that as a reaction to this code, an immigrant organization had developed an “alternative code,” which

consisted of seven statements about the rights of immigrants to be relatively free in their adoption of Dutch culture in the domains of religion, norms, and identity (e.g., “We oppose religious extremism and we oppose that on the basis of appearance characteristics like clothing, people are treated as religious extremists”). After reading the passage, participants were asked to indicate for each of these statements to what extent they agreed on a seven-point scale, ranging from 1 (*total disagreement*) to 7 (*total agreement*), with higher scores indicating greater support for immigrant rights in the Netherlands. Participants were then asked for demographic information and were shown a cartoon to enlighten their mood. Afterwards, they were rewarded and debriefed.

Results

A one-way ANOVA with the manipulation (Mortality Saliency, Life Saliency, and Control) as independent variable and with the composite score of worldview adherence (agreement to immigrants’ demands; $\alpha = .75$) as dependent variable revealed significant differences between conditions, $F(2, 77) = 3.17, p = .05, \eta^2 = .08$. Contrast analysis revealed that that agreement with the alternative code was lower under Life Saliency ($M = 5.55, SD = 1.04$) compared to the Control condition ($M = 6.10, SD = .66$), $F(1, 55) = 5.91, p = .02, \eta^2 = .10$, and similarly Mortality Saliency ($M = 5.74, SD = .81$) differed from the Control condition, $F(1, 51) = 3.27, p = .09, \eta^2 = .06$.¹ There was no difference between the Existential Life Saliency and Mortality Saliency conditions ($F < 1$).

Study 1c

In Study 1c, we opted for another measure of worldview adherence. We focused on the effects of mortality and existential life saliency on the endorsement of a typical Dutch value: the desire for equal treatment regardless of sexual orientation. In Dutch society and politics, this is a value that seems relatively independent of political beliefs and is often proudly cited and celebrated as a cultural achievement. For example, the late politician Pim

Fortuyn – considered by many as a right-wing nationalist – was very popular, and he frequently talked openly about his homosexuality and personal sexual behavior on national television. A pilot study confirmed that Dutch participants generally regarded the desire for equal treatment independent of one's sexual orientation as a typical aspect of Dutch culture. Specifically, of twenty-one participants, 14 indicated that they perceived the value as highly typical, whereas 5 were neutral, and only 2 regarded it as non-typical. Furthermore, participants strongly agreed with the statements “We need to recognize discrimination against homosexuals in order to fight it,” and “If there is discrimination against homosexuals, we should take care of this.” Average agreement ($M = 6.26$, $SD = .90$) significantly differed from the theoretically neutral value of four, $t(20) = 11.48$, $p < .001$, $d = 5.13$. Based on the assumption that the desire for equal treatment independent of one's sexual orientation is a shared Dutch cultural worldview, we predicted increased adherence to the cultural worldview under *both* mortality salience and life salience compared to a condition.

Method

Participants and design. Sixty-three Dutch visitors (27 females; $M_{\text{age}} = 39$, $SD = 10.02$) of a public library were willing to participate in a paper-and-pencil study in exchange for a candy bar. They were again randomly assigned to the Mortality Saliency, Life Saliency, or Control condition.

Materials and procedure. The materials and procedure were similar to those of Study 1b except for the measure of worldview adherence, which consisted of an article that highlighted several unsolved problems regarding the equal treatment of homosexuals in terms of reduced career opportunities, lower salaries, and psychological problems arising from discrimination; it described a proposal of the Dutch national organization for homosexuals advocating that the state should do more to address these issues. After reading the article, participants were asked to indicate their agreement to four questions that measured the

support for the organization's proposal (e.g., "To what extent do you agree with the organization's stance?"). Participants indicated their responses on seven-point scales ranging from 1 (*total disagreement*) to 7 (*total agreement*), with higher scores reflecting greater support. Afterwards, participants were rewarded and debriefed.

Results

A one-way ANOVA with our manipulation as independent variable and the worldview adherence measure (agreement to rights of homosexuals; $\alpha = .79$) as dependent variable revealed significant differences between the three conditions, $F(2, 60) = 5.34, p < .01, \eta^2 = .15$. The average endorsement of the cultural value was higher under Life Salience ($M = 4.59, SD = .94$) than in the Control condition, ($M = 3.84, SD = 1.22$), $F(1, 38) = 4.74, p = .04, \eta^2 = .11$. Furthermore, the average endorsement of the cultural value was higher under Mortality Salience ($M = 4.91, SD = 1.10$) versus the Control condition, $F(1, 41) = 9.21, p < .01, \eta^2 = .18$. Again, there was no difference between the Life Salience and Mortality Salience conditions ($F < 1$).

Discussion

Based on the findings that life and death thoughts are closely related (e.g., Silvia, 2001; see also King et al., 2009), we expected similar effects of life and death salience on worldview adherence. Importantly, King and colleagues (2009) demonstrated that mortality salience in specific increases the appraisal of life's meaningfulness. The results of our studies so far indicate that both mortality and life salience made people appraise life's meaningfulness and boosted worldview adherence compared to a control condition. In addition, the findings from Study 1a suggest that the observed parallel effects on worldview adherence unlikely stem from increased salience of creatureliness thoughts. These findings are conceptually consistent with the research by Silvia and King and colleagues but add that

appraising life's meaningfulness and contemplating death additionally increase adherence to the worldviews that give life its meaning.

Study 2

The results of Study 1a suggest that both life salience and mortality salience make people appraise life's meaningfulness, and we argue that this appraisal of meaning in life is reflected in the value attached to worldviews – which are related to life's meaningfulness (see Heine et al., 2006). Indeed, the results of Study 1b and 1c suggest that contemplating life increases worldview adherence relative to a control condition in the context of Dutch culture.

To examine the relation between appraising life's meaningfulness and the value attached to worldviews in more detail we next experimentally manipulated whether people appraised life as meaningful or as meaningless. Specifically, we tested in Study 2 whether existential thoughts about a *meaningful* life compared to a relatively *meaningless* life hence affected the evaluation of a *symbol* associated with Irish culture, specifically a Shamrock (i.e. an Irish clover). In addition, we included four symbols that were *not* particularly relevant to the worldview (pi sign, a star, a square root sign, and a spiral) in this cultural context, and one symbol that was relevant and carries negative meaning: a danger sign. Given that a general sense of meaningfulness is associated with more specific meaning-laden pieces of information, we argue that when people appraise life in general as meaningfulness, then this will affect perceptions of the more specific worldviews. We therefore predicted that contemplating life's meaningfulness (vs. meaninglessness) would affect the evaluations of the two symbols that carried meaning, but would not affect the evaluation of neutral signs. That is, the cultural worldview symbol associated with positive aspects of one's identity, the Shamrock, was expected to be evaluated more positively when participants contemplated meaningfulness than when they contemplated meaninglessness of life. In contrast, the symbol associated with the negative meaning, a danger sign, was predicted to be evaluated more

negatively when participants contemplated meaningfulness than when they contemplated meaninglessness of life.

Method

Participants and design. Thirty-four *Irish* undergraduate students from the University of Limerick participated in a paper-and-pencil study in exchange for a candy bar (18 females; $M_{\text{age}} = 20$, $SD = 6.71$). Participants were randomly assigned to the Meaningful Life or Meaningless Life condition.

Materials and procedure. After giving informed consent and reporting demographic information, participants were either asked to describe an event in which they felt that life was highly meaningful or utterly meaningless. Next, participants rated the extent to which they experienced a sense of meaningfulness and a sense of meaninglessness during the event on scales ranging from 1 (*not at all*) to 7 (*very much*), followed by a filler text on computers. In the current study, meaningfulness appraisals were assessed using the established presence of meaning in life scale developed by Steger, Frazier, Oishi, and Kaler (2006). Participants rated the 5 items (e.g., 'I understand my life's meaning') on seven-point interval scales from 1 (*strongly disagree*) to 7 (*strongly agree*). Next, participants evaluated six symbols; one that was associated with participants' national identity (a Shamrock), one that was associated with danger, and four neutral symbols (a pi sign, a star, a square root sign, and a spiral). A within subjects pilot study among 29 Irish students confirmed that participants regarded the Shamrock symbol significantly more important in life compared to each of the neutral symbols (all $ps < .05$), as was the case for the danger sign (all $ps < .01$). In addition, participants rated the meaning of the Shamrock symbol on a scale from -3 (*very negative*) to 3 (*very positive*) as most positive and significantly more positive ($M = 2.10$, $SD = 1.11$) compared to the neutral value of 0, $t(28) = 10.18$, $p < .001$, $d = 3.85$, whereas the danger sign was evaluated as most negative and significantly more negative compared to the neutral value

of 0 ($M = -1.03$, $SD = 1.76$), $t(28) = -3.16$, $p < .01$, $d = 1.19$. Participants evaluated the extent to which they liked these symbols on seven-point interval scales ranging from 1 (*not at all*) to 7 (*very much*). Afterwards, participants were thanked, debriefed, and rewarded.

Results

Meaningfulness at the time of the recalled event. Ratings of meaningfulness and meaninglessness were averaged after recoding the meaninglessness item ($r = .64$, $p < .001$). The results of a one-way ANOVA showed that that participants in the meaningful life condition felt significantly more meaningful at the time of the event ($M = 5.56$, $SD = 0.87$) compared to participants in the meaningless life condition ($M = 3.11$, $SD = 0.92$), $F(1,32) = 63.34$, $p < .001$, $\eta^2 = .66$, thus demonstrating the effectiveness of our manipulation.

Presence of meaning in life. The five items of the presence of meaning in life scale were averaged after recoding the reversed item ($\alpha = .80$) and then entered as dependent variable into a one-way ANOVA with the meaningfulness of life as independent variable. This analysis indicated that participants in the meaningful life condition considered also life in general to be more meaningful ($M = 4.63$, $SD = 1.18$) compared to participants in the meaningless life condition ($M = 3.77$, $SD = 1.20$), $F(1,32) = 4.38$, $p = .04$, $\eta^2 = .12$.

Evaluation of symbols. A 2 x 6 repeated ANOVA was conducted with the meaningfulness of life as between participants variable, the symbols as within participants variables, and the symbol evaluations as dependent variables. This analysis revealed significant differences across the evaluations of the symbols, $F(5, 150) = 6.22$, $p < .001$, $\eta^2 = .17$, no main effect of the manipulated meaningfulness of life, $F(1, 30) = 2.07$, $p = .16$, $\eta^2 = .06$, and the critical interaction between the meaningfulness of life manipulation and what symbol was evaluated, $F(5, 150) = 12.54$, $p < .001$, $\eta^2 = .30$. As reflected in Figure 2, participants' evaluations of the Shamrock were significantly higher among participants who described a meaningful life ($M = 5.31$, $SD = 1.40$) compared to participants who described a

meaningless life ($M = 2.12$, $SD = 0.86$), $t(31) = 7.96$, $p < .001$, $d = 2.86$. In reverse, the danger symbol was evaluated more negatively in the meaningful life condition ($M = 2.69$, $SD = 1.92$) compared to the meaningless life condition ($M = 5.06$, $SD = 1.47$), $t(31) = 4.06$, $p < .001$, $d = 1.46$. No significant effects were found on the other symbols (all $ps > .11$).²

Discussion

Based on the argument that general appraisals of life meaningfulness are closely associated with specific cultural worldviews (e.g., symbols), we predicted that participants who thought of life's meaningfulness – and hence appraised life as meaningful – would give more positive evaluations of a symbol positively related to their worldview and more negative evaluations of a symbol representing danger. Consistent with this reasoning, the results of the present study confirmed that participants who contemplated life's meaningfulness evaluated a national symbol more positively than those who contemplated life's meaninglessness, and participants contemplating the meaningfulness of life also disliked a symbolic representation of threat to a greater degree compared to participants who contemplated life's meaninglessness. In sum, these findings are consistent with the idea that appraising life as meaningful compared to meaningless is reflected in increased meaning-related judgments, the basis for increased adherence to cultural worldviews.

Study 3

As proposed, we found in Study 2 that boosts in worldview adherence occurred as a function of appraising life's meaningfulness. Study 3 extended the previous studies by including a different manipulation of meaningfulness and by assessing worldviews on a diverse set of measures. Cultural worldview adherence was measured in two different domains (materialism and support for Queen Beatrix), and we additionally measured a relatively personal worldview by examining how people reacted to meaningful or meaningless structures adopting the 'modern art-evaluation' paradigm inspired by Landau

and colleagues (2006). These researchers found that the effect of mortality salience on art evaluations was moderated by individual differences in personal need for structure and that this moderation emerged because participants high in need for structure were more likely to perceive modern art as meaningless compared to people low in need for structure. Consistent with this reasoning, we included a measure of individual differences in perceived meaningfulness of the artwork as a moderator of the effect of life's meaningfulness on art evaluations.

With regard to the cultural worldview measures, Kasser and Sheldon (2000) found that mortality salience led people to endorse one specific western world worldview; namely materialism. Furthermore, Landau and colleagues (2004) demonstrated that mortality salience and reminders of 9/11 increased support for the American president, G. W. Bush – an indicator of support for the culturally dominant worldview among an American audience. As the current study was conducted in the Netherlands, we selected support for Queen Beatrix, the Dutch monarch, as a measure of support for a cultural symbol.

Following Landau and colleagues (2006) we expected that when the meaningfulness of existence was high (vs. low), then attractiveness ratings of art would decrease (increase) when the artwork was seen as meaningless (vs. meaningful). Adherence to the materialistic worldview was expected to increase when existential life thoughts were associated with a meaningful existence compared to a meaningless existence. Similarly, we expected greater adherence to Queen Beatrix when people appraised life as meaningful compared to meaninglessness.

Method

Participants and design. Fifty-five visitors to a shopping mall in the Netherlands were willing to participate in a twenty minute paper-and-pencil study in exchange for a free drink at one of the mall's restaurants. Five participants did not follow the instructions

(skipping measures) and were therefore excluded from the analyses, leaving a total amount of 50 participants (31 females; average age 34, $SD = 16.60$), who were randomly assigned to either the High or Low Meaningfulness of Existence condition; the order in which the indicators of worldview adherence were assessed was varied following a Latin square rationale. Preliminary analysis revealed no main or interaction effects of order on any of the measures (all $ps > .16$).

Materials and procedure. Participants were handed a questionnaire and an additional envelope containing a picture of Jackson Pollock's painting *Guardian of the Secret*, which they were not to open until instructed to do so. The first page of the questionnaire consisted of a consent form, which informed participants of their anonymity and their right to stop at any time; it also provided appropriate contact information.

Independent variables. Rather than asking participants to describe what makes life meaningful or meaningless, we manipulated meaning appraisals in the current study more indirectly. Our appraisal manipulation was designed to make participants appraise life from different angles, as either meaningful or relatively meaningless. We developed two scenarios, both of which were preceded by the statement: "A large study on the impact of the senses has revealed that sight plays a crucial role in the appreciation of life. This is because sight is very important for the enjoyment of experiences." Thereafter, participants were provided with a scenario that described life as working as a nature guide and enjoying the nature every day. In the High Meaningfulness condition, the scenario further described a situation of relatively untroubled living, with only a minor issue concerning a trivial disease that did not pose a serious threat. This was followed by two essay questions: "Describe the emotions that the thought of this diagnosis elicits," and "Describe the emotions that the thought of your subsequent life elicits." These questions were included to assure that people really reflected on the scenario. In the Low Meaningfulness condition, participants contemplated on a

relatively meaningless existence. In this case, the trivial disease would lead to irreversible blindness. This scenario was also followed by two essay questions: “Describe the emotions that the thought being diagnosed with this disease elicits,” and “Describe the emotions that the thought of your subsequent life elicits.” As such, we elicited existential life thoughts that were associated with a relatively meaningless existence. The scenarios were followed by a filler (a maze), and the measures of worldview adherence.

Art impressions. Participants were shown a picture of Jackson Pollock’s painting *Guardians of the Secret* (Landau et al., 2006). We assessed art impressions with the question: “How attractive do you find this piece of art?” measured on a scale from -3 (*not attractive*) to 3 (*highly attractive*). Landau and colleagues’ argued that evaluations of art were moderated by individual differences (need for structure) that reflect the extent to which people perceive modern art as meaningful. Following this rationale, we measured individual differences in perceived meaningfulness of the artwork with six questions (e.g., “To what extent do you consider this piece of art meaningful?”), on a scale from -3 (*not meaningful*) to 3 (*very meaningful*).

Cultural Worldviews. We adopted the pleasure spending measure used by Kasser and Sheldon (2000) in their first experiment as an indicator of materialism. Participants predicted the amount of money they would spend on clothing, entertainment, and leisure activities after 15 years from now. As a result of successful pilot studies, we assessed support for Queen Beatrix with a four-item scale (e.g., “I think Queen Beatrix fulfills her role as Queen of the Dutch very well.”), that yielded good internal reliability ($\alpha = .82$). All items had to be rated on a seven-point scale, ranging from 1 (*total disagreement*) to 7 (*total agreement*), with high scores indicating greater support for Queen Beatrix.

Appraisals of life’s meaningfulness. Two items were added to measure appraisals of life’s meaningfulness as a manipulation check: “Do you consider your existence to be

meaningful?” and “Do you understand the meaning of life?” Both were rated on a six-point interval scale, ranging from 1 (*not at all*) to 6 (*very much*), with high scores indicating higher perceived meaningfulness of life.

Results

Appraisals of life’s meaningfulness. The two items measuring perceptions of a meaningful existence were significantly positively correlated ($r = .41, p < .01$), and were therefore averaged and entered it in a one-way ANOVA, which revealed a significant effect, $F(1, 48) = 5.17, p = .03, \eta^2 = .10$. In line with our predictions, life was appraised as more meaningful when meaningfulness of life was high ($M = 5.00, SD = .84$) compared to low ($M = 4.48, SD = .76$). These results demonstrate the effectiveness of our appraisal manipulation.

Worldview adherence. An exploratory factor analysis on the measures of worldview adherence and art impressions (we recoded the art impression scores for those participants who regarded the artwork as meaningless, so that the original interaction was now represented by a main effect of meaningfulness of existence) revealed a single underlying factor, which we labeled ‘worldview adherence.’ Participants’ scores on this factor were entered as dependent variables in a one-way ANOVA with the High and Low Meaningfulness of Existence conditions as independent variable. As predicted, this analysis indicated that participants in the High Meaningfulness of Existence condition more strongly adhered to the worldviews ($M = 0.36, SD = 0.62$) compared to those in the Low Meaningfulness of Existence condition ($M = -0.52, SD = 0.65$), $F(1, 40) = 19.34, p < .001, \eta^2 = .33$.³

Mediation. We argue in our model that increased worldview adherence results from appraising life’s meaningfulness, and the appraised meaningfulness of existence should hence at least partially mediate the effects obtained on worldview adherence and art evaluations. The manipulated meaningfulness of existence was dummy coded (high = 0, low = 1) and was

entered as predictor of the extracted factor. Results indicated a significant relationship, $\beta = -.57$, $t(40) = 4.40$, $p < .001$. Next, the extracted factor was regressed on the appraised meaningfulness of life, yielding a significant relationship, $\beta = .44$, $t(40) = 3.13$, $p < .01$. The extracted factor was regressed on both meaningfulness of existence and appraised meaningfulness. Both predictors were significant, $\beta = -.49$, $t(39) = 3.95$, $p < .001$ for meaningfulness of existence; $\beta = .33$, $t(39) = 2.60$, $p = .01$ for the appraised meaningfulness of life. Estimation of the mediated effect using an accelerated bootstrapping method suggested by Preacher and Hayes (2008) employing 1,000 bootstraps, confirmed the existence of a significant mediated effect, $Z = 1.98$, $p = .02$. These results indicate that the effect of the meaningfulness of existence manipulation on the extracted factor was partially mediated by the degree to which life was appraised as meaningful.

Discussion

As predicted, we found that if one's existence is appraised as meaningful, then existential life salience led to greater adherence to worldviews in the context of Dutch culture, compared to when one's existence was appraised as meaningless. In addition, these effects were partially mediated by the measured appraisal of life's meaningfulness. These results are fully in line with our reasoning that the value attached to worldviews in part reflect people's general appraisals of life's meaningfulness.

Study 4

We investigated in Study 4 whether an increase in adherence to worldviews was found under *both* life and mortality salience when life was appraised as meaningful versus relatively meaningless. For this purpose, we adopted a meaning-appraisal manipulation for life salience *and* mortality salience. Our measures of worldview adherence in this study were cultural conservatism and support for Queen Beatrix, again in the context of Dutch culture. We predicted that thoughts of life and death associated with a meaningful existence would

yield higher worldview adherence compared to existential thoughts associated with a meaningless existence.

Method

Participants and design. Ninety-two visitors to a Dutch public library agreed to participate in this study in exchange for a bag of candies. Nine participants were excluded from our analyses, as they failed to follow instructions (skipping measures). The remaining sample consisted of 83 participants (55 females; $M_{\text{age}} = 32$, $SD = 13.60$) who were randomly assigned to the four cells of a 2 (Existential Thoughts: Mortality vs. Life) x 2 (Meaningfulness of Existence: High vs. Low) between-participants design.

Materials and procedure. For the purpose of this study it was necessary to develop a meaning-appraisal manipulation for mortality salience. We developed two new scenarios on mortality that participants were asked to imagine which both started with a statement: “Last year, more than 40,000 people passed away due to cancer. Therefore, this disease is responsible for three out of ten cases of death. The total amount of deaths due to cancer is increasing every year.” In both mortality salience scenarios it was further described that one was diagnosed with terminal cancer. In the mortality salience scenario associated with a meaningful existence a situation of living with relatively little physical or mental problems associated with the disease was described. To assure that people carefully reflected on the scenarios we again included two essay questions. For the high meaningfulness of existence these read: “Describe the emotions that the thought of hearing this news about your death and the possible reactions of your relatives elicits,” and “Describe the emotions that the thought of your death elicits.” In the low meaningfulness of existence these read: “Describe the emotions that the thought of this suffering elicits,” and “Describe the emotions that the thought of death as an end of this suffering elicits.” As in Study 3, participants read imagined

of the scenarios and answered the questions to assure that they carefully did so. The manipulation of life salience was identical to Study 3.

Worldview adherence. We measured cultural conservatism using two measures. First of all, participants responded to twelve items indicative of conserving and protecting the dominant Dutch culture (e.g., “Foreigners who misbehave in the Netherlands should be treated harshly.”); six of these items were reverse scored (e.g., “People should be more open-minded towards other cultures and customs.”). These statements were rated on scales ranging from 1 (*total disagreement*) to 7 (*total agreement*). In addition, participants indicated to what extent they considered themselves left-wing or right-wing and progressive or conservative by rating this on two seven-point scales ranging from 1 (highly left-wing; progressive) to 7 (highly right-wing; conservative). We measured support for Queen Beatrix with the four-item measure used in Study 3.

Pilot Study. To verify that our manipulation of appraised meaningfulness across the mortality and life salience conditions worked, we assigned forty students of the University of Limerick (22 females; $M_{\text{age}} = 20.95$, $SD = 2.96$) to the manipulation of Study 4 in a pilot study. Participants then indicated their agreement with the questions “If this happened to you, would you think that life was still meaningful?” and “If this happened to you, would you think that life had become meaningless?” on scales from 1 (*not at all*) to 7 (*very much*). A two-way ANOVA on the combined meaningfulness items (after reversing the meaningfulness item, $r = .81$, $p < .001$) confirmed that participants appraised life to be more meaningful for the High Meaningfulness of Existence condition ($M = 6.15$, $SD = 1.05$) compared to the Low Meaningfulness of Existence scenarios ($M = 4.20$, $SD = 1.57$), $F(1, 36) = 20.84$, $p < .001$, $\eta^2 = .37$. Neither differences between the life and death conditions, nor an interaction effect was observed (all F s < 1). Hence, the procedure was useful for inducing different appraisals of life’s meaningfulness across the life and mortality salience scenarios.

Results and Discussion

First, aggregated scores were calculated for each of the three worldview adherence measures after recoding reversed items where applicable (support for Queen Beatrix: $\alpha = .86$; cultural conservatism statements: $\alpha = .62$; self-reported cultural conservatism: $r = .38, p < .01$). An exploratory factor analysis on the aggregated measures of worldview adherence revealed a single underlying factor, which we labeled ‘worldview adherence.’ Participants’ scores on this factor were entered as dependent variables in a two-way ANOVA with the High and Low Meaningfulness of Existence manipulation and the Life vs. Mortality Thoughts manipulation as independent variables. As reflected in Figure 3, this analysis revealed no main effect of the Life vs. Mortality Thoughts manipulation ($F < 1$), and also no interaction effect ($F < 1$). Importantly, the predicted main effect of Meaningfulness of Existence was observed, $F(1, 79) = 6.46, p = .02, \eta^2 = .08$, indicating that participants in the High Meaningfulness of Existence condition more strongly adhered to the worldviews ($M = 0.26, SD = 0.92$) compared to those in the Low Meaningfulness of Existence condition ($M = 0.23, SD = 0.82$).⁴

The obtained results confirm that appraisals of life’s meaningfulness affect specific worldviews, the specific components of one’s overall meaning system (e.g., Heine et al., 2006). These effects were found under conditions of both contemplations of life and death. Specifically, by manipulating whether existence was appraised as high or low in meaningfulness, higher worldview adherence was found when thoughts of life and death were associated with an existence that was appraised as meaningful, compared to when the associated existence was appraised as relatively meaningless. These results not only provide further evidence for the similar effects of existential life and death thoughts on worldview adherence, but they also reveal how the appraisal of life’s meaningfulness accounts for their mutual relationship.

General Discussion

Do thoughts about life affect worldviews and worldview adherence? Can life salience lead to similar effects as those documented for mortality salience? In order to obtain answers to the above questions, we integrated and extended past research by Silvia (2001), and King and colleagues (2009) resulting in an approach to mortality (and life) salience effects that was different from the motivational processes outlined in TMT and the MMM: We reasoned that appraising life as meaningful – be it by thinking of death or by thinking of life – increases adherence to cultural worldviews, as these contribute to life’s meaningfulness (see Figure 1).

We found that both life salience and mortality salience elicited thoughts concerning the meaningfulness of life (Study 1a). Moreover, similar to mortality salience, life salience increased worldview adherence as measured by out-group derogation (Study 1b) and the endorsement of a cultural value (Study 1c). We next investigated whether existential life thoughts only elicit worldview adherence when existence was appraised as meaningful. Study 2 revealed that meaningful compared to meaningless life contemplations enhanced the evaluation of a positive national symbol and led to greater aversive reactions to a symbolic representation of danger, with both effects indicating greater worldview-related judgments when life is appraised as meaningful (vs. meaningless). In Study 3 we found that when induced existential life thoughts were associated with an existence that was appraised as relatively meaningless, participants were less inclined to dislike meaningless or appreciate meaningful art, and less worldview adherence was found on materialism and support for the Dutch queen Beatrix.

We adopted different manipulations of life’s meaningfulness (presenting scenarios and asking participants to describe life’s meaningfulness or meaninglessness), all leading to similar results. This is important, as it suggests that it is the appraisals of life’s meaningfulness *in particular* that accounts for the obtained results. In sum, regarding the

question “Can thoughts about life lead to worldview adherence?” we found the answer would be that it can (Study 1a, 1b, & 1c), especially when life is appraised as meaningful (Study 2, 3 & 4).

We found the same pattern of results in Study 4, when directly manipulating the theoretical mediator, that appraisals of life’s meaningfulness yielded parallel results for *both* existential life and death thoughts on worldview adherence – operationalized by cultural conservatism and support for the Dutch queen Beatrix. Consistent with the notion that meaning-appraisals underlie these effects (e.g., Greenberg, et al. 2004) we found that only when life was meaningful, worldview adherence was high. Regarding the question “Can life salience lead to similar effects as those documented for mortality salience?” we found that it can. Not only did life and death thoughts lead to similar effects on worldview adherence (Study 1b & 1c), but the effects in both cases also attenuated when directly manipulating the underlying process such that the meaningfulness of the appraised existence is low compared to high.

The finding that existential life thoughts yield similar effects as mortality provides a major theoretical contribution by showing that worldview adherence may also arise when people reflect on (meaningful) life. Specifically, our results suggest that classic mortality salience effects on worldview adherence may be understood from the perspective that death thoughts add to life’s meaningfulness (see also King et al., 2009). Extending the research by King and colleagues (2009), we suggested and found that the meaning appraisals directly affect underlying meaning-laden worldviews, be it in the context of life or death reflections.

No Meaningful Existence, Less Worldview Adherence

8,400: the number of suffering patients who explicitly requested help ending their own lives in the Netherlands during the year 2005 (Onwuteaka-Phillipsen, Gevers, Van der Heide et al., 2007). Intuitively, one would assume that death is regarded as a threat to life and

the things we value. Yet, it seems that these people's conditions led them to conclude that death would actually provide a relief. Our research indicates that viewing life as generally meaningful versus meaningless increases the value attributed to the worldviews that give life its meaning. Reversely, perceiving life as relatively meaningless is associated with a decrease in the value that is attributed to the worldviews. One reason why some people come to the conclusion that life is no longer valued of death may be because they do no longer subscribe to the values associated with the specific worldviews that are part of their culture.

We found that the elicitation of existential thoughts about life or death about a *meaningless* life did *not* increase worldview adherence as much as when they were associated with a *meaningful* life. Counterintuitively, our findings reveal that existential thoughts of life and mortality generally elicit worldview adherence, but that these salience effects diminish when the meaningfulness of the associated existence is low. We conceptualized life and death as inseparable concepts, reminders of which can elicit appraisals of life's meaningfulness. Heine and colleagues (2006) introduced MMM as a broad framework for understanding the human need for meaning and make three claims about how people create and defend a sense of meaning. Interestingly, MMM's conceptualization of meaning as relations between concepts has obvious similarities with our interpretation of the parallel thought processes that underlie life and death salience effects as mentioned by Silva (2001) and King and colleagues (2009). We proposed and found that the value attached to worldviews changes as a function of life appraised meaningfulness. In other words, the meaning that is assigned to life critically affects the evaluations of the specific worldviews that give life its meaning.

Unlike MMM or TMT, however, the process that we propose does not require the additional assumption of an underlying motivation to defend against meaning threats. Our research hence illuminates how non-motivational processes may at least partially underlie mortality and life salience effects (hence worldview *adherence* rather than worldview

defense). We found both experimental evidence (Study 3 and 4) and meditation evidence (Study 3) that meaning appraisals can effectively explain why life and mortality salience have similar effects, but it is important to note that we do not wish to convey that the effects of life and mortality salience are necessarily determined by a single common underlying process. Potential other processes may to some extent be involved as well, such as mood-effects or defensive mechanisms. Our research indicates that meaning appraisals in particular are one important facet underlying mortality and life salience effects. In the broader sense, our research adds to the research indicating that existential psychological phenomena may involve a verity of parallel processes, including existential threat responses (e.g., Greenberg et al., 2004), defenses against uncertainty (e.g., McGregor, Zanna, Holmes, & Spencer, 2001; see also Van den Bos, 2004), fulfilling epistemic needs (Dechesne & Kruglanski, 2004), and automatic meaning-regulation processes (Van Tongeren & Green, 2010).

Some readers may find it implausible that contemplating a ‘good life’ leads to worldview adherence. If we think of a ‘good life’ as a meaningful existence and consider the psychological process, then this quasi paradoxical finding can straight-forwardly be explained: When people contemplate the meaningfulness of their existence and the sources of meaning then they are likely to assimilate appraisals of life’s meaningfulness to these thoughts. Worldviews, central components of people’s meaning system (e.g., Heine et al., 2006), are thus actualized and strengthened, resulting in boosts in worldview adherence.

It is also important to clarify that, despite the scenarios used in Study 4, we do not believe that physical or mental disabilities necessarily make life less meaningful. Especially when people have serious, long-term impairments – as for example with permanent blindness or with many forms of cancer – they may adapt to these circumstances, rather than appraising their existence as meaningless for a long period (e.g., Brickman, Coates, & Janoff-Bulman,

1978). These adaptive processes indicate how important it is for people to create and maintain the view that life is meaningful.

Conclusions

TMT (Greenberg et al., 1986, 2004) states that the conflict between the realization of inevitable death and the desire to survive threatens one's perception of the meaningfulness of existence (Pyszczynski et al., 2004; Dechesne & Kruglanski, 2004). The findings presented here shed a somewhat different light on this assertion. It appears that both mortality and life salience *can* boost worldview adherence. If in both cases life is generally appraised as meaningful, then personal and cultural worldviews, central components of one's overall meaning system, are strengthened. If life is not generally appraised as meaningful, then worldview adherence is less pronounced.

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Footnotes

¹ Given that we predicted this effect, the appropriate one-tailed test results in a significant difference at the α -level of .05.

² We also conducted a 2 x 3 mixed ANOVA with the manipulated meaningfulness of existence as between subjects variable, the meaning of the symbols as within subjects variable (positive vs. neutral vs. negative), and the evaluations of the Shamrock, aggregated neutral symbols, and danger sign as dependent variables for the positive, neutral, and negative levels of the meaning factor, respectively. There was no overall within subjects differences, $F(2, 62) = 2.28, p = .11, \eta^2 = .07$, no main effect of meaningfulness of existence, $F(1, 31) = 1.38, p = .25, \eta^2 = .04$, but we observed the critical significant interaction, $F(2, 62) = 53.51, p < .001, \eta^2 = .63$. In addition, a mediation analysis following the bootstrapping procedure by Preacher and Hayes (2008) with the Meaningfulness of Existence as independent variable, the presence of meaning in life as mediator, and exploratory factor-scores of the danger sign and shamrock, indicated a marginally significant indirect effect, $0.00 < B_{90} < 0.22$.

³ Similar findings were obtained when conducting analyses based on the separate measures of worldview adherence, including the expected interaction effect on art evaluations. Details can be provided on request.

⁴ Similar findings were obtained when conducting analyses based on the separate measures of worldview adherence. Details can be provided on request.

Figure 1. The Perception of Life’s Meaningfulness and its Reciprocal Relation to Worldviews.

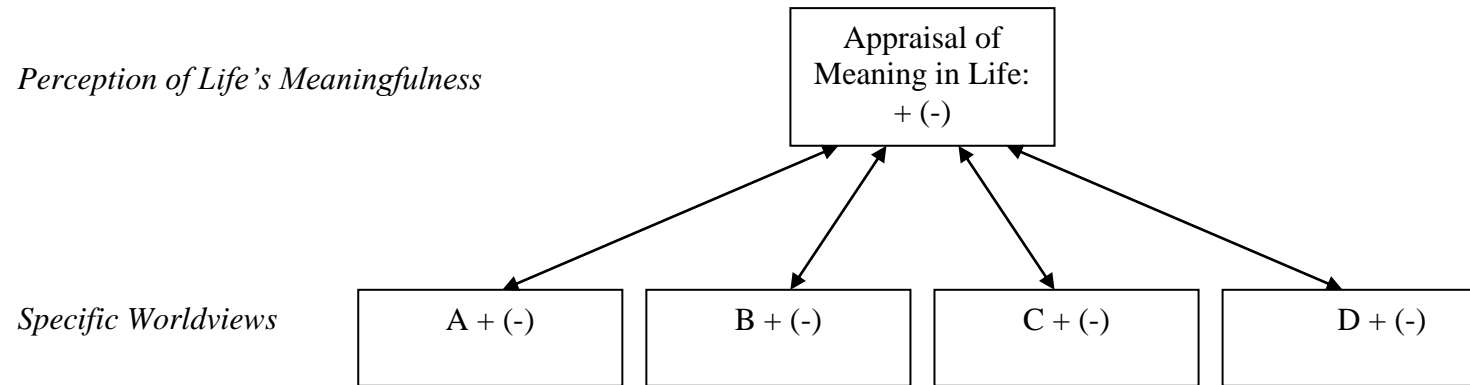


Figure 1. The structure of the perceived meaningfulness in life and its relation to specific worldviews (e.g., cultural values, religion, in-group beliefs). Worldviews serve as source of meaning in life and appraising life’s meaningfulness (vs. meaninglessness) strengthens (weakens) the endorsement the specific worldviews.

Figure 2: Evaluation of Symbols as a Function of Appraising Life as Meaningful or Meaningless (Study 2)

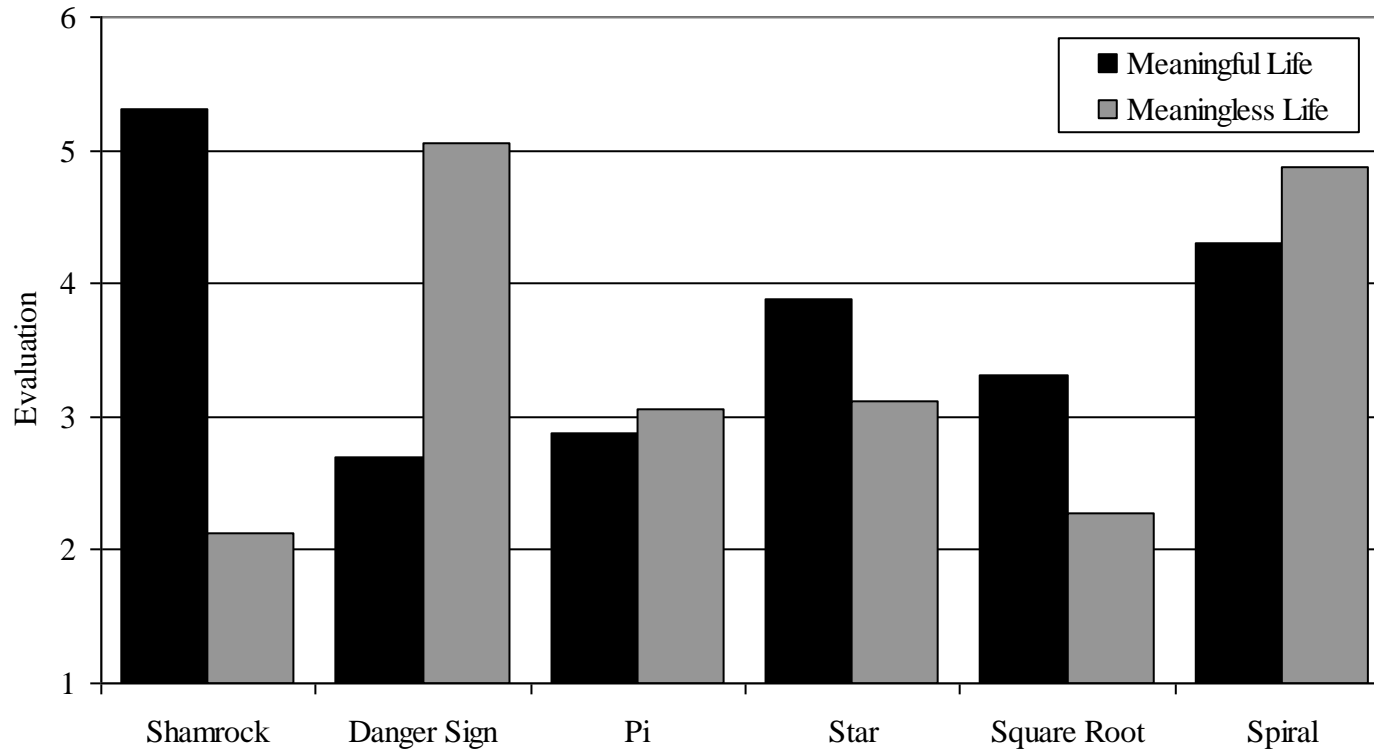


Figure 3: Worldview Adherence as a Function of Appraising Life as Meaningful or Meaningless When Contemplating Life or Death (Study 4)

